Asian Journal of Healthy and Science
p-ISSN: 2980-4302
e-ISSN: 2980-4310
Vol. 5 No. 2 February, 2026

Implementation of the Setia (Pharmacist E-Telepharmacy System) Application Based on Artificial Intelligence for Monitoring Drug Therapy in Hospitals

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Abstract

Drug interactions, dosage regimen accuracy, and assessment of clinical parameters such as ideal body weight, nutritional status, and renal function are important aspects in the safe and rational use of drugs. SETIA application was developed as a clinical decision support system to assist healthcare professionals in evidence-based clinical decision-making. This study aimed to evaluate the suitability of drug interaction recommendations, interaction mechanisms, dosage regimens, and clinical parameters between the SETIA application and international reference literature. An observational analytical study with a cross-sectional design was conducted at Fatmawati General Hospital, Jakarta, using medical records of hospitalized patients. The analysis included identification of the severity of drug interactions, interaction mechanisms, dosage regimen recommendations based on renal function, and calculation of ideal body weight, nutritional status, and glomerular filtration rate (GFR). The results of the SETIA application were compared with reference literature (Lexicomp, Medscape, Micromedex, Drug.com, The Renal Drug Handbook, NHLBI, ClinCalc LLC, and Clinical Creatinine Clearance). The level of agreement between the SETIA application and the literature was 53.3%, with the highest agreement in the moderate-moderate category (33.3%). All data met the assumptions of homogeneity and normality ($p > 0.05$). The SETIA application showed good agreement with the reference literature in identifying drug interactions, interaction mechanisms, dosage recommendations, and calculating clinical parameters. These findings support the hypothesis that the SETIA application has the potential to be used as a clinical decision support system to support safe, rational, and evidence-based drug use, especially in hospitalized patients.

Keywords: SETIA; Artificial Intelligence; PTO; Interaksi Obat; Regimen Dosis.

INTRODUCTION

Clinical pharmacy services are direct services provided by pharmacists to patients in order to improve therapeutic outcomes and minimize the risk of side effects due to drugs, for the purpose of patient safety so that the patient's quality of life is guaranteed. One of the clinical pharmacy services, namely drug therapy monitoring (DMT), is a process that includes activities

to ensure safe, effective and rational drug therapy for patients. The purpose of DMT is to increase the effectiveness of therapy and minimize the risk of adverse drug reactions (ADRs) (Permenkes, 2016). Drug therapy problems that often occur in DMT activities by clinical pharmacists in hospitals are monitoring drug interactions, dosage regimens, creatinine clearance adjustments and body mass index. The results of Setiadi's 2024 study, regarding the occurrence of potential drug interactions at Fatmawati Hospital Jakarta, patients with potential drug interactions were 69 patients (78.4%), the severity of moderate drug interactions was 157 interactions (71.4%) and the pharmacodynamic phase drug interactions were 177 (80.5%) (Setiadi, 2024). In Indonesia today, applications integrated with hospital systems are commonly used by medical professionals, such as for prescription writing and online consultations with patients (Hajianti & Hakim, 2024; Ayang & Niken, 2024; Giri et al., 2024).

The computerized prescribing process makes it easier for doctors to write prescriptions and minimizes errors in hospital prescriptions. The development of hospital information systems continues into the Industry 4.0 era, where Industry 4.0 principles combine the digitization of clinical, medical, and laboratory data with the implementation of automation of manual processes long used by hospitals and other healthcare services (Saputra, 2025; Grammatikopoulou et al., 2024; Aharaz et al., 2023). Through innovations in computing and Internet of Things systems, these system improvements minimize delays and provide opportunities for the medical industry to significantly improve healthcare services. The use of Internet of Things (IoT)-based medical information technology provides a health education tool that delivers information directly to patients via smartphone. The information obtained increases patients' knowledge of their disease, and patients can integrate it with pharmacological and non-pharmacological treatments (Rahmayanti et al., 2023; Ziwei et al., 2024; Dahmani & Alex, 2024; Thottempudi et al., 2025).

A systematic review found that the use of artificial intelligence (AI) in pharmacy practice has expanded widely and offers significant benefits. The study demonstrated that pharmacy automation through the application of AI not only improves service efficiency and patient safety but also enhances patient satisfaction. Therefore, the use of AI in hospital pharmacy needs to be expanded to support optimal healthcare quality (Bakhsh et al., 2024; Allam, 2025; Alam et al., 2025; Alqahtani et al., 2025). AI in healthcare has been shown to be beneficial for earlier disease detection, personalized care, process automation, and improved hospital safety. These findings emphasize that AI implementation strategies in hospitals should focus on improving ease of use, providing tangible benefits, and supporting enabling conditions for optimal AI adoption by healthcare professionals (Swathi et al., 2025; Epelde, 2024; De Micco et al., 2024; Aiwerioghene & Osuchukwu, 2025).

Previous studies have explored various applications of AI and clinical decision support systems (CDSS) in telepharmacy and medication management. Bakhsh et al. (2024) conducted a narrative review demonstrating that AI applications in pharmacy practice significantly enhance medication dispensing accuracy, drug interaction detection, and patient counseling effectiveness. Alqahtani et al. (2025) performed a systematic review revealing that AI-based CDSS in clinical pharmacy settings improved clinical outcomes, reduced medication errors, and enhanced pharmacist workflow efficiency. However, most existing AI telepharmacy systems have been developed and validated primarily in Western healthcare contexts, with limited adaptation and validation in Southeast Asian hospital settings. Furthermore, few studies

have systematically compared AI-based pharmacy applications against multiple international reference standards simultaneously, particularly for the integrated assessment of drug interactions, dosage adjustments, and clinical parameters. This research gap is particularly significant in Indonesia, where healthcare system characteristics, medication availability, and patient demographics differ substantially from Western contexts.

Clinical pharmacy practice has been developed and strengthened through an AI-based application for drug therapy monitoring in hospitals. This AI resulted in the development of the SETIA (Pharmacist E-Telepharmacy System) application for PTO, with the following features: drug interaction monitoring, dosage regimens, creatinine clearance calculations, and BMI analysis. The novelty of the SETIA application lies in its comprehensive, integrated approach to drug therapy monitoring, combining multiple clinical decision support functions within a single platform specifically designed for the Indonesian healthcare context. Unlike existing commercial drug interaction checkers that typically focus on single parameters, SETIA integrates drug interaction screening, renal function-based dosage adjustment, nutritional status assessment, and anthropometric calculations into a unified AI-driven system. The application employs a rule-based expert system architecture built upon established pharmacological principles and clinical guidelines, utilizing algorithmic decision trees derived from authoritative pharmacotherapy references and validated clinical databases.

This application helps identify risks when patients take multiple medications simultaneously and takes these into consideration according to the patient's clinical condition (Setiadi et al., 2025). Through its drug interaction monitoring feature, the AI application can detect potential high-risk interactions, allowing pharmacists to provide recommendations more quickly before adverse events occur. The dosing regimen and creatinine clearance calculation features help pharmacists assess dose appropriateness in patients with impaired renal function, who are among the most vulnerable populations to drug toxicity. Meanwhile, BMI analysis provides additional information on nutritional status, which can impact drug pharmacokinetics and pharmacodynamics. Therefore, an evaluation of the accuracy of this application's recommendations will be conducted at Fatmawati Hospital, Jakarta, in 2025. This study was conducted to evaluate drug therapy monitoring (DMT) conducted through an AI-based application. In the quantitative phase, a prospective cross-sectional design was used to analyze the results of DMT implementation during the use of the SETIA (Pharmacist E-Telepharmacy System) application for inpatients at Fatmawati Hospital.

The study was conducted during July–September 2025. The purpose of this study was to assess the effectiveness of the PTO application in improving the quality of clinical pharmacy services for pharmacists in hospitals. The evaluation was carried out by comparing the results of the application analysis (Drug interactions, BMI, Dosage Regimen and ClCr) with the literature or reference standards currently used in hospitals. The data obtained were then analyzed using the Independent t-test to see significant differences between the results of the SETIA application (Pharmacist E-Telepharmacy System) compared to trusted clinical references, namely Drug interaction literature: (Lexicomp, Medscape, Micromedex), dosage regimen: (The Renal Drug Handbook) BMI: NHLBI (National Heart Lung And Blood Institute) and ClinCalc LLC. Kidney function assessment: CCC (Creatinine Clearance Calculator).

RESEARCH METHODS

This study aims to evaluate the monitoring of drug therapy (PTO) conducted through an AI-based application. In the quantitative phase, a prospective cross-sectional design was used to analyze the results of implementing PTO during the use of the SETIA application (Pharmacist E-Telepharmacy System) in inpatients at Fatmawati Hospital from July to September 2025.

This is an observational analytic study with a cross-sectional design. The research was conducted at Fatmawati General Hospital (RSUP) in Jakarta by analyzing inpatient medical records. The entire research process was carried out by the researcher in accordance with health research ethics guidelines.

The study subjects were inpatients who met the inclusion criteria, namely having complete medical records that included demographic information, weight, height, nutritional status, serum creatinine levels, drug therapy regimens, and other clinical data necessary for drug interaction analysis and dosage adjustments. The data used were secondary data obtained from patient medical records.

The collected data were analyzed using the SETIA application (Pharmacist E-Telepharmacy System) and compared with international reference literature. The analysis focused on several aspects, including:

Drug Interaction Identification: Drug interactions in patients were analyzed using the SETIA application and compared with reference literature from Lexicomp, Medscape, Micromedex, and Drug.com. The severity of the interaction was classified as minor, moderate, or major, and the appropriateness between SETIA and the literature was assessed.

Analysis of Drug Interaction Mechanisms: The mechanisms of drug interactions identified by the SETIA application were compared with the explanations of drug interaction mechanisms in reference literature. The assessment focused on the similarity of pharmacokinetic and/or pharmacodynamic mechanisms described.

Evaluation of Dosage Regimen: The recommended drug dosage regimen, particularly for patients with kidney dysfunction, was analyzed using the SETIA application and compared with the literature from The Renal Drug Handbook. The focus was on the appropriateness of dosage, frequency, and considerations regarding the patient's kidney function.

Clinical Parameters Analyzed Include:

a. Ideal body weight, compared with calculations based on NHLBI (National Heart, Lung, and Blood Institute) literature.
b. Nutritional status, compared with the calculation method from ClinCalc LLC.
c. Kidney function (GFR), compared with calculations based on Clinical Creatinine Clearance (CCC).

Statistical analysis was conducted to assess the consistency and differences between the SETIA application results and the reference literature. Before further analysis, the following were performed:

a. Homogeneity tests for variance to ensure uniformity of data across groups.
b. Normality tests to assess data distribution.

All data that met the assumptions of homogeneity and normality were analyzed using parametric statistical tests, specifically the Independent t-Test, with a significance level set at

$p < 0.05$. Statistical analysis was used to determine whether there were significant differences between the SETIA application calculations and the literature methods.

RESULTS AND DISCUSSION

This study uses a total sampling method, where all subjects who meet the inclusion criteria during the study period are included. The researcher conducted direct visits to inpatient wards to monitor drug therapy using the SETIA application (Pharmacist E-Telepharmacy System). The inclusion criteria for this study are: inpatients with complete quantitative data related to drug therapy, patients receiving more than one medication (polypharmacy), and inpatients recorded during the study period from July to September 2025. This approach was chosen to provide a comprehensive overview of the effectiveness of the application in the drug therapy monitoring process (PTO) for the entire relevant population during the specified period.

Evaluation of Comparison Recommendations between the Application vs. Literature for Drug Interaction and Dosage Regimen Parameters

The following presents the results of drug interaction recommendations, including a comparison of the severity of drug interactions (minor, moderate, and major) and the recommended mechanisms of drug interactions from the SETIA application, compared with literature recommendations (Lexicomp, Medscape, Micromedex), and the assessment of regimen dose accuracy against literature (The Renal Drug Handbook). The results of the comparison between drug interactions (IO) using the SETIA application and the reference literature (Lexicomp, Medscape, Micromedex, and drug.com) (Ragam & R, 2023; Karalliedde, 1998) show a variation in the classification of drug interactions. According to the obtained data, the agreement between the SETIA application and the literature was recorded in several categories: moderate-moderate (33.3%), major-major (6.7%), and minor-minor (13.3%). In total, 16 cases (53.3%) showed agreement, while 14 cases (46.7%) showed discrepancies. The highest agreement was found in the moderate-moderate category, which indicates that the SETIA application is capable of identifying drug interactions of moderate severity, which are commonly encountered in clinical practice.

The highest agreement was found in the moderate-moderate category, indicating that the SETIA application has the ability to identify drug interactions with moderate severity in accordance with the literature. This is important because moderate-level interactions are frequently encountered in clinical practice and require special attention, though they do not always necessitate discontinuing therapy. The agreement in the major-major category also suggests that the SETIA application is able to detect drug interactions with high clinical risk that may cause serious effects, thus supporting safer clinical decision-making.

Table 1. Comparison of Recommendations between the Application vs. Literature for Drug Interaction and Dosage Regimen Parameters

Drug Interaction Severity Comparison	Number	Percentage (%)	Result/Percentage
Application	**Literature**		
Moderate - Moderate	10	33.3	Agree
Major - Major	2	6.7	Agree

Drug Interaction Severity Comparison	Number	Percentage (%)	Result/Percentage
Minor - Minor	4	13.3	Agree
Major - Moderate	5	16.7	Disagree
Disagree	14 (46.6%)		
Major - Minor	3	10.0	
Major - Not Significant	1	3.3	
Moderate - Minor	2	6.7	
Moderate - Not Significant	2	6.7	
Minor - Not Significant	1	3.3	
Total Patients	30	100%	100%

Table 2. Drug Interaction Mechanism Narrative Agreement

Result	Number	Percentage (%)	Outcome
Agree	23	76.7	Same Recommendation
Disagree	7	23.3	Different
Total Patients	30	100%	

Table 3. Dosage Regimen

Result	Number	Percentage (%)	Remarks
Agree	26	86.7	Accurate
Disagree	4	13.3	Inaccurate
Total	30	100%	

However, some discrepancies were still found, especially in classifications between major-moderate (16.7%), major-minor (10.0%), as well as moderate-minor and moderate-not significant (each 6.7%). These discrepancies may be due to differences in reference sources, severity rating methods, and the data updates used by each application. Moreover, variations in the clinical impact interpretation of drug interactions can also influence the classification of severity. The discrepancy between minor and not significant also suggests that some interactions were evaluated as having a lower clinical impact by SETIA or vice versa. This highlights that drug interaction classification systems are still relatively subjective and highly dependent on the clinical context, patient characteristics, and the application developer's policies.

The SETIA application is developed based on various trusted scientific literature and databases related to drug interactions. The reference collection process was conducted systematically from standard pharmacology textbooks and clinical databases widely used in pharmacy practice and clinical decision-making. The main references include *The Pathophysiologic Basis of Drug Therapy*, *Katzung: Basic & Clinical Pharmacology*, *Stockley's Drug Interactions*, *AHFS Drug Information*, as well as electronic databases such as Lexicomp, Micromedex, UpToDate, Medscape Drug Interaction Checker, and Clinical Pharmacology.

Overall, the results show that the SETIA application has a good level of agreement with the literature, especially in detecting drug interactions of moderate and major severity. Therefore, this result emphasizes that SETIA should be used as a clinical decision support

system (CDSS) to complement healthcare professionals' assessments, rather than replace clinical judgment.

Based on the analysis of the drug interaction mechanism agreement between the SETIA application and the reference literature, the majority of the data showed high agreement. A total of 23 out of 30 cases (76.7%) were deemed consistent, where the interaction mechanisms identified by the SETIA application aligned with the recommendations and explanations in the literature. An example of the SETIA application's narrative: "The interaction of Korolac with Paracetamol may increase the risk of kidney damage," while the literature states: "Increased risk of kidney side effects." Both describe the mechanism's impact on kidney function. This indicates that the SETIA application has a strong knowledge base in explaining drug interaction mechanisms, both pharmacokinetically and pharmacodynamically. However, 7 cases (23.3%) were found to be inconsistent. These discrepancies are likely due to differences in reference sources, limitations in literature updates, or variations in the interpretation of interaction mechanisms by the SETIA application system. Some drug interactions may have more than one mechanism reported in the literature, so differences in focus explanations could affect the consistency of results.

Regarding the dosage regimen, the results showed a higher level of agreement. A total of 26 cases (86.7%) were deemed consistent, indicating that the dosage regimen recommendations provided by the SETIA application align with the literature and clinical guidelines (Ashley & Dunleavy, 2017). For example, the recommended antibiotic dosage for ceftriaxone from SETIA is "2 X 1g/Day," while the literature recommends a dosage of 2-4g/day, both providing a range below the literature's upper limit. This evaluation of dosage regimen consistency focuses on considering the patient's kidney function, and it is expected to provide dosage considerations before being given to patients with kidney dysfunction. The high level of agreement emphasizes the potential of the SETIA application as a tool to support the accuracy of drug therapy, particularly in preventing dosage errors that can impact the effectiveness and safety of treatment. However, 4 cases (13.3%) showed discrepancies, for example, the SETIA recommendation for ciprofloxacin was "500mg/Day," while the literature suggested a dose of 500-750mg/12 hours. This result shows a difference in duration that is below the literature's recommendation. These discrepancies may be influenced by individual patient factors that have not been fully accommodated in the application system, such as age, comorbid conditions, and specific clinical indications. Furthermore, variations in dosage guidelines across different therapeutic protocols could also explain these differences.

The SETIA application is based on references in clinical pharmacology, pharmacokinetics, and pharmacodynamics. Primary reference sources include standard textbooks such as Katzung: Basic & Clinical Pharmacology (14th ed.) (Katzung & Trevor, 2018), The Pharmacological Basis of Therapeutics (12th and 13th eds.) (Brunton, 2014), Remington: Clinical Pharmacy and Therapeutics, Pharmacotherapy Handbook (10th ed.) (Wells et al., 2020), Drug Information Handbook (2020), and Clinical Pharmacokinetics (4th ed.). In addition to textbooks, the development of SETIA also refers to reputable scientific journals and clinical guidelines, such as the British Journal of Clinical Pharmacology, Journal of Pharmacy & Pharmacology, American Journal of Health-System Pharmacy (Cohen et al., 2026), and publications related to the effects of specific drugs. Professional organizations and clinical practice-based sources are also key references, particularly publications from the

American Society of Health-System Pharmacists (ASHP) and the American Heart Association (AHA), which provide evidence-based information on drug use, drug interactions, and their clinical implications (Radkowski et al., 2024).

Homogeneity and Normality Test Results for Ideal Body Weight, Nutritional Status, and CrCl (Kidney Function)

This evaluation will discuss the comparison of SETIA application recommendations with literature in terms of Ideal Body Weight, Nutritional Status, and CrCl (Kidney Function) using Independent t-Test to analyze differences in means between the application and trusted literature. Before performing the test, homogeneity and normality tests were conducted as prerequisites for parametric tests. All tests were conducted at a confidence level.

Table 4. Homogeneity Test

Variable	F-Value	Sig. Value	Note
Ideal Body Weight	0.393	0.533	Homogeneous
Nutritional Status	0.004	0.948	Homogeneous
Clcr	0.103	0.750	Homogeneous

The results of the homogeneity test show that all study variables have significance values greater than 0.05. The Ideal Body Weight variable has a Sig. value of 0.533, Nutritional Status is 0.948, and ClCr is 0.750. This indicates no significant variance differences between groups, so the data can be considered homogeneous. Therefore, the assumption of homogeneity has been met, allowing for further statistical analysis.

Table 5. Normality Test

Treatment	Sig. Value	Description
Setia Application	0.105	Normally Distributed
Literature (Nhlbi)	0.073	Normally Distributed
Setia Application	0.072	Normally Distributed
Literature (Clincalc Llc)	0.109	Normally Distributed
Setia Application	0.200	Normally Distributed
Literature (Ccc)	0.200	Normally Distributed

Based on the normality test results, all data from each treatment group show significance (Sig.) values greater than 0.05, both for the SETIA application group and the reference literature groups (NHLBI, ClinCalc LLC, and CCC). This indicates that the data are normally distributed. Therefore, it can be concluded that the assumption of normality has been met, and the data are suitable for further analysis using parametric statistical tests, such as the Independent t-Test.

The results of the Independent t-Test for the difference in ideal body weight (IBW) using the application and the literature (National Heart, Lung, and Blood Institute)

This evaluation will discuss the comparison of SETIA application recommendations with literature in terms of ideal body weight (IBW) using the Independent t-Test to determine the difference in the average between the use of the application and trusted literature. The table below presents the results:

Table 6. Results of the Ideal Body Weight Difference Test vs. Literature

Treatment	Number	Average	Significance (P-Value)
Setia Application	30	54.9957	0.464
Literature (Nhlbi)	30	56.1267	

The comparison of ideal body weight (IBW) measurements between the SETIA application and the literature based on NHLBI (National Heart, Lung, and Blood Institute) (NHLBI, 2025) shows that the average IBW calculated by the SETIA application is 54.9957, while the calculation based on NHLBI literature gives an average of 56.1267. Although there is an average difference of 1.131 kg, this difference is not statistically significant.

Based on the results of the t-test, a p-value of 0.464 was obtained, which is greater than the significance threshold of $p > 0.05$. This result indicates that there is no significant difference between the ideal body weight measurements using the SETIA application and the calculation method based on NHLBI literature. This suggests that the SETIA application produces an ideal body weight estimate comparable to the standard literature that has been widely used. The lack of statistical significance in this difference indicates that the ideal body weight calculation algorithm implemented in the SETIA application is consistent with the standard formula recommended by NHLBI. This serves as preliminary evidence that the SETIA application has good validity in supporting body weight status assessment as a clinical consideration, especially in drug therapy planning that requires body weight-based dosage adjustments.

Moreover, the alignment of these results has important implications in clinical practice, as determining ideal body weight is a crucial parameter in calculating certain drug dosages, particularly in patients with obesity, malnutrition, or other special conditions. The SETIA application has the potential to help healthcare professionals estimate ideal body weight quickly and accurately, thus improving efficiency and the safety of healthcare services.

The results of the Independent t-Test for the difference in nutritional status using the application and the ClinCalc LLC literature

This evaluation will discuss the comparison of SETIA application recommendations with literature in terms of nutritional status using the Independent t-Test to determine the difference in the average between the use of the application and trusted literature. The table below presents the results:

Table 7. Results of the Nutritional Status Difference Test vs. Literature

Treatment	Number	Average	Significance (P-Value)
Setia Application	30	23.6273	0.913
Literature (Clincalc Llc)	30	24.1123	

The comparison of nutritional status measurements between the SETIA application and the literature based on ClinCalc LLC shows that the average value produced by the SETIA application is 23.6273, while the literature provides an average value of 24.1123. This relatively small average difference indicates that, descriptively, the results of both methods are within a similar range (LLC., 2025).

Based on the results of the Independent t-test, a p-value of 0.913 was obtained, which is greater than the significance threshold of $p > 0.05$. This indicates that there is no statistically

significant difference between the nutritional status measurements using the SETIA application and the calculation method based on the ClinCalc LLC literature (LLC, 2024). This suggests that both methods provide comparable results.

These findings indicate that the nutritional status calculation algorithm implemented in the SETIA application is consistent with the standard formula used in international reference literature. This consistency provides evidence that the SETIA application can offer accurate and consistent nutritional status estimates, making it a promising tool for evaluating patient nutritional conditions.

In clinical and pharmaceutical practice, the measurement of nutritional status plays an important role in determining nutritional needs and adjusting drug dosages, which are influenced by the patient's nutritional condition. Therefore, the alignment of results between the SETIA application and the ClinCalc LLC literature supports the use of the SETIA application as a clinical decision support system (CDSS) that helps healthcare professionals assess nutritional status quickly and efficiently.

The results of the Independent t-Test for the difference in ClCr using the application and the Creatinine Clearance Calculator literature

This evaluation will discuss the comparison of SETIA application recommendations with literature in terms of creatinine clearance (ClCr) using the Independent t-Test to determine the difference in the average between the use of the application and trusted literature. The table below presents the results:

Table 8. Results of the ClCr Difference Test vs. Literature

Treatment	Number	Average	Significance (P-Value)
Setia Application	30	78.013	0.759
Literature (Ccc)	30	74.733	

The comparison of the Glomerular Filtration Rate (GFR) values between the SETIA application and the literature based on Clinical Creatinine Clearance (CCC) (CLCR, 2025) shows that the average GFR calculated by the SETIA application is 78.013, while the literature gives an average value of 74.733. Descriptively, the average GFR calculated by the SETIA application is slightly higher than that of the literature, but the difference is relatively small.

Based on the results of the Independent t-test, a p-value of 0.759 ($p > 0.05$) was obtained, indicating no statistically significant difference between the GFR calculations using the SETIA application and the method based on the CCC literature. This suggests that both methods provide comparable results in estimating kidney function.

These findings indicate that the kidney function calculation algorithm implemented in the SETIA application is consistent with the standard formula used in reference literature. This alignment has important clinical implications, as GFR is a key parameter in adjusting drug dosages, particularly for patients with impaired kidney function. The use of the SETIA application has the potential to assist healthcare professionals in quickly and accurately estimating kidney function, thus supporting safer and more rational drug therapy (Kumar et al., 2023).

The level of agreement between the SETIA application and the reference literature was recorded at 53.3%, with the highest agreement in the moderate–moderate category (33.3%),

followed by minor–minor (13.3%) and major–major (6.7%). These results indicate that the SETIA application is quite effective in identifying drug interactions, particularly those with moderate severity, which are most commonly encountered in clinical practice. The high level of agreement in this category suggests that the SETIA application has potential as a clinical tool for monitoring and managing rational drug therapy.

The analysis results show that most of the drug interaction mechanisms identified by the SETIA application align with the reference literature, with an agreement rate of 76.7%. This finding suggests that the SETIA application has a sufficient knowledge base to explain drug interaction mechanisms, both pharmacokinetically and pharmacodynamically. The consistency in the narrative between the SETIA application and the literature, particularly regarding the impact of interactions on kidney function, demonstrates the consistency in the explanation of clinically relevant mechanisms. However, 23.3% of discrepancies remain, likely due to differences in source references, literature updates, and variations in the interpretation of interaction mechanisms.

Regarding dosage regimen, the SETIA application showed a high level of agreement with the reference literature, at 86.7%. This result indicates that the dosage recommendations provided by the SETIA application are consistent with clinical guidelines, especially The Renal Drug Handbook, taking into account the patient's kidney function. The high level of agreement emphasizes the potential of SETIA as a tool to support the accuracy and safety of drug therapy, particularly in preventing dosage errors in patients with kidney dysfunction. However, 13.3% of discrepancies remain, likely due to variations in dosage guidelines, specific clinical indications, and individual patient factors that have not been fully accommodated in the application system. This suggests the need for further development to enhance the personalization of dosage recommendations.

The homogeneity test results indicate that all study variables had significance values >0.05, namely Ideal Body Weight (0.533), Nutritional Status (0.948), and ClCr (0.750), indicating no variance differences between groups, thus the data is homogeneous. Additionally, the normality test showed that all data from the SETIA application and reference literature groups (NHLBI, ClinCalc LLC, and CCC) had significance values >0.05, indicating a normal data distribution. With the fulfillment of homogeneity and normality assumptions, the data is suitable for further analysis using parametric statistical tests, specifically the Independent t-Test.

The analysis results show that the average ideal body weight calculated by the SETIA application (54.9957) is comparable with the calculation based on the NHLBI literature (56.1267), with an average difference of 1.131 kg, which is statistically insignificant. The t-test showed a p-value of 0.464 ($p > 0.05$), indicating no significant difference between the two methods. This finding suggests that the ideal body weight calculation algorithm in the SETIA application is consistent with the NHLBI standards. This agreement demonstrates the validity of the SETIA application in supporting the assessment of ideal body weight as a clinical consideration, especially in drug therapy planning based on body weight, and has the potential to enhance the efficiency and safety of clinical practice.

The analysis results show that the average nutritional status calculated by the SETIA application (23.6273) is comparable to the ClinCalc LLC literature method (24.1123), with a relatively small difference. The Independent t-test showed a p-value of 0.913 ($p > 0.05$),

indicating no significant difference between the two methods. This finding suggests that the nutritional status calculation algorithm in the SETIA application aligns with international reference standards. This agreement indicates the potential of SETIA as a clinical decision support tool for rapid and efficient assessment of patient nutritional status, especially in adjusting drug therapy and nutritional needs.

The analysis results show that the average GFR calculated by the SETIA application (78.013) is comparable to the Clinical Creatinine Clearance (CCC) method (74.733), with a relatively small difference. The Independent t-test showed a p-value of 0.759 ($p > 0.05$), indicating no significant statistical difference between the two methods. This finding suggests that the kidney function calculation algorithm in the SETIA application aligns with reference literature standards. This agreement highlights the potential of the SETIA application as a clinical decision support tool in estimating kidney function to support safe and rational drug dosage adjustments.

CONCLUSION

This study demonstrates that the SETIA application exhibits good agreement with reference literature in identifying drug interactions, explaining interaction mechanisms (76.7% agreement), and recommending dosage regimens (86.7% for kidney function-based adjustments), with the highest concordance in moderate-level interactions; calculations of clinical parameters like ideal body weight, nutritional status, and GFR also showed no statistically significant differences from international standards, supported by data meeting homogeneity and normality assumptions ($p > 0.05$). These findings validate the application's potential as a clinical decision support system for safe, rational, and evidence-based medication use. For future research, longitudinal studies could evaluate the SETIA application's real-world impact on patient outcomes, such as reducing adverse drug events, while incorporating machine learning to enhance personalization for diverse patient profiles, including pediatrics and geriatrics.

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