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Original Article

Assessment of Pharmacist Prescription Screening Processes Using Eye Tracking Technology: A Mixed-Method Pilot Study

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Abstract

Background: Accurate medication dispensing is essential for patient safety. Electronic prescription (EP) systems are effective because they support the cognitive functions of pharmacists. Eye tracking provides rapid, objective insights into the visual attention and cognitive engagement of pharmacists interacting with EP interfaces, offering details unmatched by other methods.

Objective: To assess prescription screening practice of pharmacists by analyzing their visual attention (fixation duration, scanpath length, and heatmaps) and cognitive engagement (qualitative responses and error detection) with EP systems using eye-tracking technology.

Methods: Ten hospital pharmacists reviewed 2 medication error scenarios using eye tracking with the Tobii Eye Tracker 4C. The interface mimicked routine hospital software, allowing free review with no time limits. Participants recorded subjective responses after identifying errors, while software logs captured their visual attention patterns (eg, fixations, scanpaths, and heatmaps) and qualitative responses to assess cognitive engagement.

Results: Ten pharmacists participated, including 5 seniors with an average of 9.4 years of hospital experience and 5 juniors with an average of 3 years. A quantitative analysis of heatmaps revealed that senior pharmacists adopt a comprehensive approach, integrating clinical data and medication details, whereas junior pharmacists primarily focus on medication names and doses. A qualitative analysis of participant responses revealed that senior pharmacists demonstrated broader attention patterns during prescription review, facilitating faster, more holistic decision-making. Although most participants correctly identified dosing errors, few participants detected interactions or duplications. These results suggest that experience influences visual focus and accuracy in prescription screening, thereby informing targeted training strategies.

Conclusions: Heatmap data revealed that senior pharmacists conducted more comprehensive reviews, with longer fixations correlating with higher accuracy. Most dosing errors were identified, and interactions and duplications were often overlooked because of over-reliance on EP tools and limited clinical judgment. These outcomes indicate the need for targeted pharmacy interventions, including enhanced clinical reasoning training and improved EP interface design for better drug interaction detection.

Keywords: Electronic prescribing system, Eye tracking, Medication error, Drug related problems, Prescription screening

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Introduction

Accurate and efficient medication dispensing is a critical component of effective healthcare delivery, directly affecting patient safety and treatment outcomes.[1] Pharmacists contribute to this process by quickly obtaining and evaluating medication information, recognizing potential drug-related problems, assessing associated risks, and making evidence-based decisions.[2] In recent years, electronic prescription (EP) systems, also known as computerized provider order entry, have been enhanced with decision-support features such as alerts for drug-drug interactions, allergies, and contraindications.[1] Despite these technological advancements, pharmacists are still required to meticulously review prescription data, interpret clinical or laboratory information, and detect potential medication errors or drug-related problems, which are critical to ensuring safe medication use.

The effectiveness of medication review systems depends on their user interface (UI) design and support for clinicians' cognitive processes. Poor UI increases workload, risks errors, and endangers patient safety. Scutt et al[3] found that decision-making and dispensing performance are linked to executive function and memory. A well-designed UI can reduce cognitive overload, enabling pharmacists to screen prescriptions more accurately and efficiently, thereby improving safety. However, understanding how pharmacists visually interact with EP interfaces during routine tasks is crucial for improving system usability and preventing errors.

Pharmacists are often unaware of the specific visual strategies they employ during prescription screening, making it difficult to capture their cognitive processes through interviews or surveys alone. Eye tracking provides access to these unconscious processes, revealing visual attention patterns that may not be readily accessible through traditional methods. Eye tracking data can be obtained more quickly and directly than most other types of cognitive data. It enables real-time tracking of visual attention shifts and serves as an objective indicator for investigating abstract constructs and complex internal cognitive processes.[4] Other tools to assess the prescription screening of pharmacists include think-aloud methods, which are used alongside semi-structured interviews to explore the cognitive processes of prescribers. Think-aloud methods help quickly identify issues by having users verbalize their thoughts while interacting with a system or performing a task, providing valuable insights with a small sample.[1]

Accordingly, this study aimed to evaluate the competency of pharmacists in prescription screening by leveraging eye-tracking technology to assess their visual attention, scanning patterns, and cognitive engagement with EP systems. By analyzing how visual attention relates to the ability to identify errors or issues, this study seeks to elucidate the link between effective visual search strategies and clinical competence. This deeper understanding can inform system design improvements and enhance medication safety, ultimately promoting safer and more efficient healthcare practices.

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Methods

Study Design, Setting, and Participants

This observational study used eye-gaze tracking technology to systematically assess participants' visual attention and behavioral patterns during prescription screening procedures. The pilot study collected data from 18 to 30 August 2024. The study was conducted in a simulation environment at Maharaj Nakorn Chiang Mai Hospital, using a replica of the existing EP system to ensure consistency with real-world applications.

Participants were recruited through simple sampling via personal invitation. Eligible individuals included 10 pharmacists with experience in screening prescriptions using the EP system. Participants had either normal vision or corrective lenses adequate for accurate eye tracking. Before participation, informed consent was obtained after a briefing, and no compensation was provided.

Interventions

Each session lasted approximately 30 minutes and began with an orientation to the basic functions of the system. Participants were then asked to complete 2 prescription screening scenarios without any decision-support system and without using any decision-support tools. The display had a resolution of 1600 × 1200. All sessions were recorded with screen capture for further analysis. The "Note" field was used for participants to write in English about any medication errors or problems they found. This helped ensure that the notes were clear and easy for researchers from both countries to understand and analyze. We also checked that all participants were good at English so that they could clearly share their thoughts and experiences.

The prescription module was designed to closely replicate the UI and key information placement of software used in routine hospital practice. The image features a simulation of hospital number and patient information, not an actual patient. However, participants were not permitted to switch to other program screens during testing. After listening to the explanation of the testing process, participants were asked to sit upright and face forward. They rested their hands on the keyboard and focused their gaze straight ahead at the computer screen displaying the assigned prescription. The task was to identify any discrepancies or errors in the prescription. The participants could review the information without any time limit or specific format constraints. However, they were instructed not to move, shake, or bow their head, shake their head during the process. Once they believe that they have found the answer, they will type their response into the note box. Participants were allowed to glance at the keyboard while typing but had to keep their head and face still and upright. During the process, participants were permitted to verbally communicate their needs or thoughts to the observer. Once they complete their response to the first prescription, the researcher observing the behavior will display the second prescription.

In the first scenario, 3 medications were included, with the main issue being an incorrect dose of Eliquis for nonvalvular atrial fibrillation—it should be 5 mg twice-daily, not thrice-daily (Figure 1). The second scenario involved 4 drugs and featured issues such as a drug interaction between amlodipine and simvastatin, as well as a duplicate prescription of a dipeptidyl peptidase 4 (DPP-4) inhibitor and a glucagon-like peptide 1 (GLP-1) agonist (Figure 2). These error types were selected based on how often they occur in real practice, their importance for patient safety, and their ability to assess different difficulty levels in error detection. The scenarios were first tested with a small group of pharmacists to ensure that they were clear and challenging. Their feedback helped us make small tweaks to improve the realistic and understandable nature of the scenarios, so that they closely mimic real-life prescription screening.

Methods of Analysis

The analysis involved identifying screen regions with the highest frequency of gaze data (visual "hotspots") and investigating the subjective experiences, perceptions, and challenges of pharmacists during screening for medication errors and drug-related problems.

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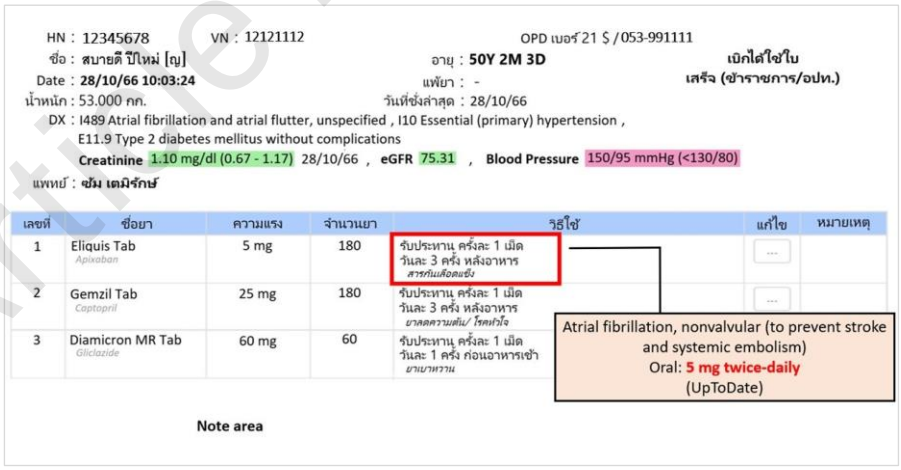
Fixation duration measures how long the eye remains focused on a specific area, indicating the level of interest or cognitive processing. Scanpath length refers to the total distance the eye travels during visual scanning, reflecting the efficiency and pattern of visual search.

A heatmap is a visual tool that shows where people look, based on eye-tracking data such as how many times or how long they focus on different areas. Instead of using words or numbers, it uses colors to represent attention: warmer colors, such as red or yellow indicate spots with more focus, whereas cooler colors, such as blue or green, indicate spots with less attention.[5] This makes it easy to see overall patterns of where people tend to look the most. In eye-tracking studies, we define specific regions as areas of interest, which are particular sections within the scene that they want to analyze more closely (Table 1). These predefined areas help focus the analysis on the parts of the image that are especially important or relevant. However, it is important to remember that heatmaps only display visual data—they do not explain why people looked there or what their focus means. To gain a deeper understanding, additional analysis or interpretation is necessary.

Subjective data were collected as participants thought aloud while screening prescriptions and during post-task interviews where they shared their thoughts. Their responses were labeled as correct or incorrect depending on whether the errors they found matched the correct ones. We also used open-ended questions to gather more detailed notes. Although we recorded some comments for extra insights, we analyzed all the qualitative data using thematic analysis within a grounded theory framework. This helped us understand the experiences and feelings of participants, adding valuable context to the quantitative eye-tracking results.

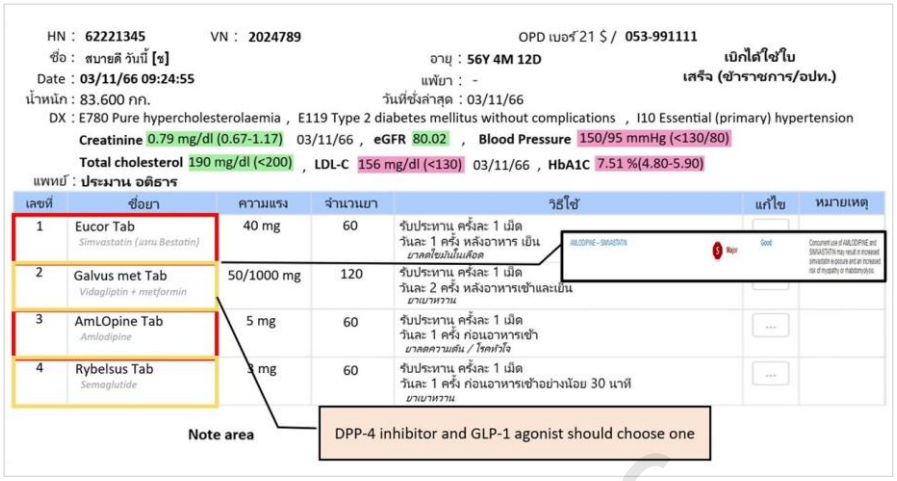
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Figure 1. Prescription 1 and Primary Issue



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

Figure 2. Prescription 2 and Primary Issue



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

Table 1. Targets of AOI in Prescriptions 1 and 2

Target of AOI in Prescription 1		Target of AOI in Prescription 2	
Look_Zone_2_P_Dx	Diagnosis	Look_Zone_3_P_Dx1	Diagnosis
Look_Zone_2_P_Lab	Lab data	Look_Zone_3_P_Lab	Lab data
Look_Zone_2_D_1	Eliquis	Look_Zone_3_D_1	Eucor
Look_Zone_2_U_1	Instruction of Eliquis 1	Look_Zone_3_D_2	Galvus
Look_Zone_2_U_12	Instruction of Eliquis 2	Look_Zone_3_D_3	Amlopine
		Look_Zone_3_D_4	Rybelsus

Abbreviation: AOI, areas of interest.

Results

This study included 10 pharmacists (Table 2). The average experience of 5 senior pharmacists in hospitals was 9.4 years, whereas that of 5 junior pharmacists was 3 years.

Focus Areas and Attention Patterns From the Heatmap

The heatmap visually represents the areas of focus or attention for junior and senior pharmacists while verifying a prescription. The color intensity, ranging from blue to red, indicates the concentration level, with red areas showing the highest focus.[5] The heatmaps imply that senior pharmacists employ a more comprehensive screening approach whereas junior pharmacists may rely more on surface-level checks. Junior pharmacists primarily concentrate on medication names and dosages, with less emphasis on integrating clinical data, which might indicate less experience or confidence in interpreting complex patient health metrics.

The results of prescription analysis and compares eye-tracking data across different groups and prescriptions, measuring attention through fixation counts and durations in specific zones and targets were found. Eye-tracking results showed for seniors and juniors during 2 prescriptions. Senior pharmacists spent more time fixating on specific zones,

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with fixation times of up to 71.96 seconds for instructions, whereas junior pharmacists had shorter fixation durations of around approximately 9.17 seconds. Senior pharmacists also had higher fixation counts, indicating a deeper focus on certain areas. Overall, senior pharmacists tend to fixate longer and more frequently on relevant zones, suggesting that they process prescription information more thoroughly (Table 3).

Prescription 1 Analysis

The heatmaps comparing junior and senior pharmacists reveal distinct attention patterns during prescription review (Figures 3 and 4). Junior pharmacists focus predominantly on specific elements such as medication names, dosages, and the note area, indicating a narrower, item-by-item review approach, likely to reflect less experience or confidence in identifying potential issues. In contrast, senior pharmacists demonstrate a broader distribution of attention, viewing the medication list, laboratory results (eg, estimated glomerular filtration rate [eGFR] and blood pressure), and notes more evenly across the interface. This suggests that experienced pharmacists adopt a more holistic approach, integrating multiple data points simultaneously, which may contribute to faster, more comprehensive decision-making and fewer details being overlooked during the review process. The note section at the bottom received considerable attention; this suggests that pharmacists actively used this area to document findings, concerns, or decisions during the prescription review process.

Prescription 2 Analysis

Overall, junior and senior pharmacists focused mainly on the medication names and dosages in the prescription (Figures 5 and 6). The heatmaps highlight differences in the visual screening strategies between junior and senior pharmacists, with seniors showing a more comprehensive and concentrated review pattern that incorporates medication details and patient clinical data. Junior pharmacists may rely more on drug names and doses, with less attention to detailed patient data, possibly owing to less experience or confidence in interpreting clinical metrics. This insight could guide targeted training or support systems to enhance prescription verification practices, especially for junior pharmacists.

Table 2. Characteristics of Participants

Characteristic	Group	
	Senior Pharmacists (n = 5)	Junior Pharmacists (n = 5)
Age, mean, y	35.8	28.4
Experience in hospital, mean, y	9.4	3.0
Gender, men/women, No.	2/3	0/5

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Table 3. Prescription Analysis Results

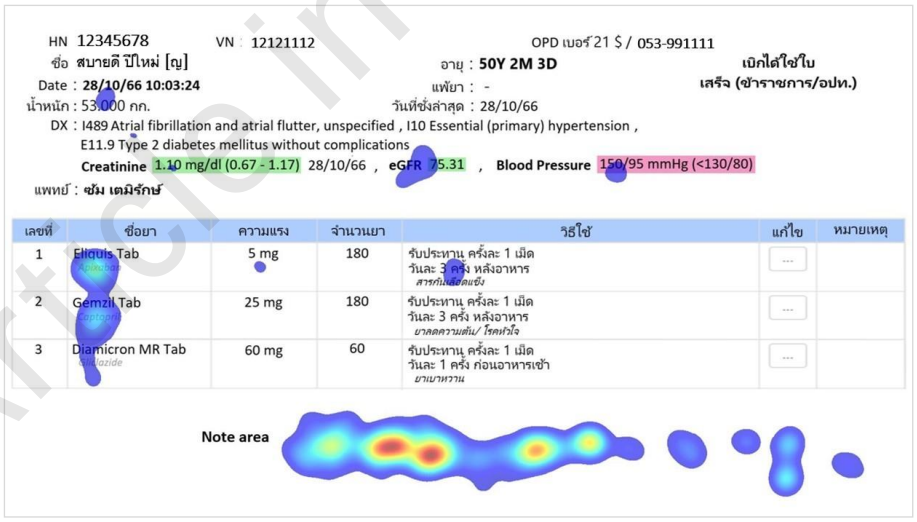
No.	Group	Prescription 1						Prescription 2					
		Total Time Shown, sec	Total Fixation Duration, sec	Fixation Duration in Zone, sec	Total Fixation Count	Fixation Count in Zone	Fixation Duration in Target, sec	Total Time Shown, sec	Total Fixation Duration, sec	Fixation Duration in Zone, sec	Total Fixation Count	Fixation Count in Zone	Fixation Duration in Target, sec
1	Senior	106.29	20.18	14.64	72.57	82.00	60.00	73.17	2.98	145.32	37.63	23.47	62.35
2	Senior	38.40	4.26	1.80	42.16	19.00	9.00	47.37	0.19	47.77	13.05	11.58	88.74
3	Senior	468.39	105.51	24.66	23.37	359.00	104.00	28.97	14.79	322.19	73.26	28.99	39.57
4	Senior	129.50	23.29	6.20	26.64	96.00	28.00	29.17	2.11	87.35	14.63	12.25	83.75
5	Senior	340.03	71.96	7.22	10.04	253.00	36.00	14.23	4.36	162.72	25.82	10.42	40.37
6	Junior	70.85	14.91	12.47	83.64	61.00	52.00	85.25	5.37	196.69	43.22	37.03	85.67
7	Junior	244.96	40.86	12.15	29.73	163.00	54.00	33.13	6.69	434.08	66.19	18.38	27.77
8	Junior	51.50	9.17	7.26	79.22	45.00	35.00	77.78	2.36	189.20	19.34	11.59	59.90
9	Junior	45.39	6.36	3.57	56.21	28.00	17.00	60.71	2.32	72.47	10.37	8.79	84.74
10	Junior	87.23	9.39	3.10	33.05	43.00	17.00	39.53	0.74	135.91	28.52	10.52	36.89

Figure 3. Overall Focus Areas and Attention Patterns of Junior Pharmacists During Prescription 1 Screening: Heatmap Analysis



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

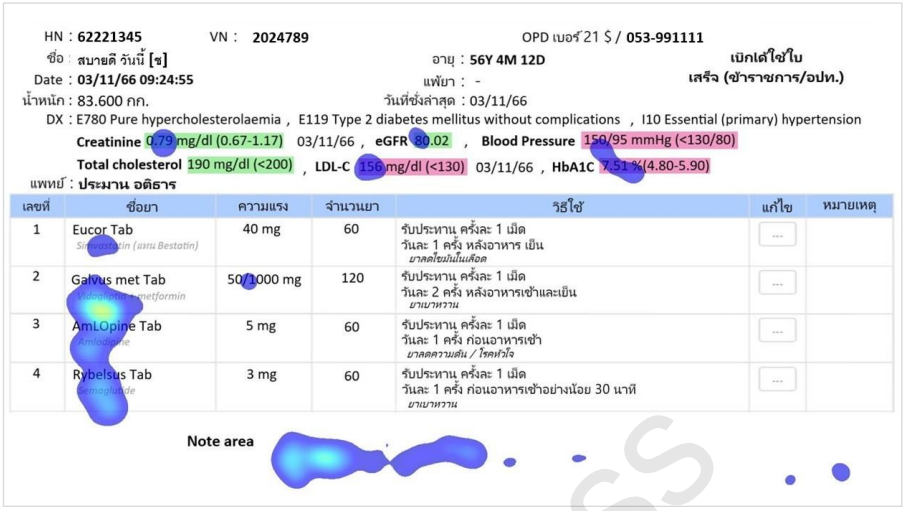
Figure 4. Overall Focus Areas and Attention Patterns of Senior Pharmacists During Prescription 1 Screening: Heatmap Analysis



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

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Figure 5. Overall Focus Areas and Attention Patterns of Junior Pharmacists During Prescription 2 Screening: Heatmap Analysis



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

Figure 6. Overall Focus Areas and Attention Patterns of Senior Pharmacists During Prescription 2 Screening: Heatmap Analysis



Disclaimer: The image contains simulated hospital number (HN) and patient information, rather than actual patient data.

Most participants correctly identified the Eliquis dosing error in Prescription 1, although only 2 senior pharmacists and 1 junior pharmacist specified the correct dose (Table 4). In contrast, responses to Prescription 2 were less accurate; only 1 junior pharmacist identified the duplication of the DPP-4 inhibitor and GLP-1 agonist and the interaction between amlodipine and simvastatin, whereas 2 senior pharmacists detected only the duplication of the DPP-4 inhibitor and GLP-1 agonist. Overall, dosing errors were

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identified more readily than interaction or duplication issues. Two junior pharmacists did not find any errors. Six participants identified primary issues mainly related to medication dosing (eg, Eliquis and Gemzil) and drug interactions or contraindications. The secondary issues included poor hypertension control, improper timing, or dosage adjustments. Among junior pharmacists, 4 reported primary problems mainly concerning incorrect dosing (eg, Eliquis and amlodipine), whereas 2 noted minor or no issues. This indicates that senior pharmacists tend to identify more complex or critical prescription problems than junior pharmacists.

Table 4. Findings From Participants' Prescription Screening

Participant	Status	Answer of Finding From Prescription 1	Answer of Finding From Prescription 2
Key answer		The dose of Eliquis for nonvalvular atrial fibrillation should be 5 mg twice-daily, not thrice-daily	Interaction between amlodipine and simvastatin, and a duplicate of the DPP-4 inhibitor and GLP-1 agonist
1	Junior	Is the dose of Eliquis or captopril incorrect?	The administration time of amlodipine should be changed
2	Junior	Eliquis must not be administered thrice-daily	Nothing is wrong
3	Senior	• Eliquis must be administered twice- daily • Diamicron should be taken with meals	• A DPP-4 inhibitor and a GLP-1 agonist should not be used together • The LDL-C level is 156 mg/dL, which is high. Consider increasing the dose of simvastatin or switching to a higher-intensity statin therapy • An eGFR of 80 mL/min/1.73 m^2 indicates normal renal function; therefore, the current dose of Galvus Met is appropriate • A blood pressure of 150/95 mmHg indicates poor control of hypertension. Consider increasing the antihypertensive medication dose
4	Junior	• The dose of Eliquis should be adjusted according to renal function • Gemzil and Diamicron should be taken with meals	Amlodipine should be taken after meals
5	Senior	• Eliquis must be administered twice- daily • The dose of Gemzil is very high • Consult to add an antihypertensive medication due to elevated blood pressure	• Galvus Met and Rybelsus are contraindicated for use together • Consult a physician to increase the potency of the statin and antihypertensive medication
6	Senior	Eliquis and Gemzil must be administered once-daily	Is there something wrong with Rybelsus?
7	Senior	The doses of Eliquis and Gemzil are very high	• The current dose of Galvus Met is appropriate for an HbA_{1c} level of 7.51% and an eGFR of 80.02 mL/min/1.73m^2 • A patient with type 2 diabetes taking Galvus Met (5/1000) twice-daily and Rybelsus (3 mg) once-daily should consult a physician to determine the appropriate duration for continuing Rybelsus • Amlodipine should be taken after meals

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Table 4. Findings From Participants' Prescription Screening (Continued)

Participant	Status	Answer of Finding From Prescription 1	Answer of Finding From Prescription 2
8	Senior	The dose of Eliquis is incorrect	• The blood pressure is very high; therefore, the dose of amlodipine should be increased • The HbA_{1c} level is very high; therefore, additional diabetes medications are needed
9	Junior	The doses of Eliquis and Gemzil are very high	Nothing is wrong
10	Junior	Eliquis must be administered twice-daily	• Eucor 40 mg has a drug-drug interaction with amlodipine • Galvus Met and Rybelsus cannot be used together

Abbreviations: DPP-4, dipeptidyl peptidase 4; eGFR, estimated glomerular filtration rate; GLP-1, glucagon-like peptide 1; HbA_{1c}, hemoglobin A_{1c}; LDL-C, low-density lipoprotein cholesterol.

Discussion

When screening a prescription, the initial stages of data collection and problem identification involve (i) observing critical information, (ii) recognizing its relevance, (iii) retaining this information, (iv) retrieving relevant details, and (v) responding appropriately within the context of the entire case.[3] Eye tracking is a sophisticated technique that employs infrared illumination to detect corneal reflections and monitor gaze behavior. During the prescription-screening process, a screen-mounted tracker was used to record gaze patterns. For each segmented screen, scan paths were extracted and visualized as heatmaps. This metric, represented as the sequence of fixated items, offers valuable insights into the cognitive processes of users during evaluation tasks. Longer fixation duration has been associated with heightened cognitive engagement, reflecting increased focus, sustained attention, and enhanced information processing.[6] Compared with junior pharmacists, senior pharmacists exhibited longer fixation durations during thinking activities involved in deriving solutions and demonstrated a greater ability to detect errors. Senior pharmacists exhibit distinct gaze patterns because of their experience, which facilitates quicker recognition, deeper knowledge integration, and more effective cognitive strategies. To bridge this gap, the findings can be applied through targeted training for junior pharmacists, focusing on clinical data integration and comprehensive screening techniques. Furthermore, UIs can be optimized to mirror the visual strategies of experienced pharmacists, and decision support tools can provide real-time alerts for potential drug interactions, ultimately enhancing the accuracy and safety of prescription screening across experience levels. These findings are consistent with those of previous research, in which performance assessments of visuospatial working memory and implicit memory tests accounted for approximately 63% of the variance in clinical decision-making ability.[3]

Common errors in pharmacist prescription screening include dosing mistakes (very low or very high), duplicated prescriptions, omitted medications, and incorrect drug selection, such as the wrong drug or indication. Eye-tracking research provides valuable insights into error-prone situations, especially when drugs with similar names are adjacent, doses exceed recommended limits, multiple interacting medications are prescribed, or contraindications exist—factors that increase dispensing errors. This technology monitors the cognitive workload of pharmacists in real time, identifying moments of high stress or complex verification.[4] Gaze pattern analysis helps researchers detect attentional lapses and

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increase cognitive load. Heatmaps complement eye-tracking data by visually highlighting areas of intense focus and overlooked regions on prescriptions and dispensing interfaces, facilitating identification of vulnerabilities and guiding targeted training to improve pharmacists' visual scanning and reduce errors. Comparative analyses reveal that senior pharmacists employ more efficient scanning strategies and detect errors more effectively. These findings support the development of training programs aimed at encouraging junior pharmacists to adopt the gaze strategies used by experienced practitioners.[7]

Implementing assisted screening tools that flag potential prescribing errors related to dosing, drug interactions, allergies, or laboratory values can help uncover hidden errors by cross-checking patient data and medication profiles that might be missed during initial reviews[8, 9]—especially when limited time and heavy workload cause pharmacists to prioritize speed over thorough screening, leading to skipped steps or insufficient follow-up on alerts. However, pharmacists may overly rely on these tools, assuming that all errors will be detected, and neglect to apply thorough clinical judgment. This can result in missed errors if the alerts are ignored or inadequately assessed. The requirement for participants to keep their heads still was primarily to ensure eye-tracking accuracy; however, this constraint introduces an artificial element that may limit the ecological validity of the findings. This restriction could alter natural screening behaviors, such as head movements, which typically occur during routine practice. Furthermore, prohibiting participants from switching between program screens reduces the realism of the simulation and represents a limitation of this study. This study has several limitations. First, the sample size was small participants were not from a single hospital and had no eye problems such as myopia, hyperopia, astigmatism, or amblyopia. Second, the testing focused solely on the main information displayed on a single screen for assessment purposes. However, in real practice, decision-making may require supporting information from multiple screens. Consequently, the findings indicated that participants concentrated on specific screen elements during the prescribing process, reflecting attention to content unique to that hospital's layout. Future research should consider incorporating more naturalistic tasks to better reflect real-world prescription screening workflows.

The clinical judgment of pharmacists is critical in identifying complex medication-related problems that automated systems may miss.[10] This study has shown that several pharmacists notice an error in the first prescription but are unable to correct it. In the second scenario, 2 junior pharmacists failed to detect any errors. Upon review, they stated that they believed the system would already catch drug interaction issues. We recommend that pharmacy curricula should focus more on teaching critical thinking and clinical judgment, not just how to use automated tools. We also recommend ongoing training to remind pharmacists to stay alert and continue catching errors on their own, even when using advanced screening systems. This will help them balance technology with good clinical reasoning. Ongoing education, including training in clinical reasoning, evidence-based updates, and error recognition, is necessary to support pharmacists in identifying and managing ambiguous or complex situations.

We acknowledge that employing a "simple sample" through personal invitations may introduce selection bias, which could limit the generalizability of our findings. Additionally, the categorization of participants into senior and junior pharmacists based solely on years of experience was primarily intended to distinguish different levels of expertise; however, other factors, such as specialized training, practice setting, or routine error detection performance, were not considered and may influence results. Recent eye-tracking studies

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and reviews on its use in healthcare, including clinical practice, diagnosis, medical performance, and teamwork, offer valuable methodological insights.[11, 12] Future studies should explore these variables to provide a more comprehensive understanding of factors affecting prescription screening performance.

Conclusions

This study introduces a novel eye-tracking technology application of focused on monitoring the medication dispensing practices of pharmacists, which is vital for ensuring patient safety and treatment effectiveness. Heatmap and performance data show that junior pharmacists tend to focus mainly on drug names and doses, whereas senior pharmacists review prescriptions more broadly by considering clinical information. Although most participants found dosing errors, only a few identified the correct dosage. Detecting drug interactions and duplicate prescriptions was rare in both groups, with only approximately 10% recognizing both issues. These results suggest that dosing errors are easier to detect than more complex clinical problems. Although eye-tracking technology can help improve screening skills, especially for less experienced pharmacists, more research is needed. Future studies with larger groups should explore how eye-tracking data can be used to design training programs that enhance error detection and promote safer dispensing practices.

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Additional Information

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Ethics Approval: The pilot study was conducted as part of the main project in Taiwan with the approval from of the Ethical Review Committee of Kaohsiung Medical University Chung Ho Memorial Hospital (KMUHIRB-SV(II)-20210065; approval period from 24 August 2021 to 31 January 2025). Ethical approval for the extension of the project in Thailand was obtained from the Ethical Review Committee of Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai University, Thailand (FAC-MED-2566-0583 on 26 January 2023). Participants provided written informed consent to be observed and recorded during the study.

Clinical Trial Consideration: This study does not report on a clinical trial.

Financial Support: No financial support was provided for this pilot study.

Conflict of Interest: The authors declare no conflict of interest.

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