DEVELOPMENT AND EVALUATION ON COMMUNITY PHARMACY PATIENT MEDICATION PROFILING SYSTEM (PMPS) IN KORONADAL CITY, SOUTH CO-TABATO

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ABSTRACT

Patient Profiling, an essential component of modern healthcare, enables personalized treatment interventions. As electronic health records (EHRs) and data analytics advance, patient profiling becomes a crucial tool for medical practitioners. This study examines the concept, advantages, and drawbacks of the patient medication profiling system through surveys and literature review. Thirty purposive samples were analyzed. The results suggest a positive view of PMPS adaptability and acceptability. There was no significant difference (p>0.05) in respondents' knowledge and perception levels before and after computerized patient medication profile intervention. However, there was significant difference (p>0.05) in factors influencing PMPS adaptation and satisfaction. Although not widely used in community pharmacies, PMPS has proven effective in evaluating patient profiles, medication types, and necessary interventions in Koronadal City, South Cotabato. This research underscores the importance of PMPS in contemporary healthcare, offering insights into its development, evaluation, and use for pharmacists and patients alike.

INTRODUCTION

The delivery of high-quality care is one of the main goals in the current healthcare environment. Making sure that pharmaceuticals are used appropriately and safely is one of the most crucial components of high-quality care. Medication-related issues, however, provide a big challenge to the healthcare industry, especially in community pharmacy practice. Drug interactions, medication mistakes, and other related problems are frequent and can have serious repercussions for patients. Thus, a system that can assist pharmacists in successfully managing medication-related difficulties is required.

Community pharmacies are essential to the availability of reasonably priced and easily accessible healthcare services in the Philippines. For the majority of patients, they serve as their primary source of pharmaceuticals, and they are frequently the first people to turn to when looking for medical assistance. Unfortunately, it can be difficult for pharmacists to successfully handle drug-related concerns because of the large number of patients and the complexity of medication regimens. The quality of medication management in community pharmacies may be enhanced by the creation of a patient medication profiling system. Pharmacists would be able to compile thorough patient profiles including all prescription and over-the-counter drug histories, medical problems, allergies, and other information. Pharmacists may find it easier to recognize possible medication-related risks for patients, such as contraindications and drug interactions.

Community pharmacies in Koronadal City, South Cotabato, require an efficient and effective pharmaceutical profiling system. The population of the city is expanding quickly, and so is the need for healthcare services. Nevertheless, there is a need for an inventive strategy to enhance medication management because community pharmacies now have inadequate medication management systems in place.

All of the prescription drugs that have been prescribed to a patient are listed in their medical profile, along with any allergies and other pertinent details that may affect how safely they can take their meds. The pharmacist will evaluate the patient's medication profile at each visit. This profile may help the pharmacist become more capable of doing their duties as a professional.

A patient's whole regimen of prescribed, over-the-counter, and other drugs is listed in a patient medication profiling system (PMPS). The PMPS can assist patients in understanding and managing their medication routine by offering information on when, why, and how to take drugs. Connection research suggests that before a prescription is filled, pharmacists should assess whether it is therapeutically acceptable. This includes establishing, modifying, or updating the patient profile as well as speaking with the patient to get pertinent data. Because a patient's health status is always changing, it is crucial to keep patient profiles up to date, and profiles should be regularly checked (2021). Checking in with the patient for a short while is the most efficient way to make sure everything is accurate. The patient's doctor may inquire about the effectiveness of their medication as well as any changes to their health or prescription regimen. There are various conversation openers that can be helpful, and this chat doesn't have to go on for very long.

There is much hope for the improvement and healing of lives with modern drugs. They can, however, cause serious injury if not handled properly. For this reason, a pharmacist's intervention is of the utmost importance in this instance.

Using a single pharmacy will help to keep all medication records in one location. This will reduce the possibility of drug duplication or harmful interactions between various medicines. Potentially harmful drug interactions or drug allergies will be known to pharmacists who know their patients well and have access to their medical records. Along with discussing potential side effects, the pharmacist can also advise you on what foods, beverages, and activities to avoid while taking the prescribed medication.

The patient's information (name, sex, weight, age, address, height, BMI), allergies, past medical history, current medication, medication adherence, difficulties connected to drugs that have been detected, and the pharmacist's name are all included in the patient medication profile.

METHODS

This study utilized a quasi-experimental research design and purposive sampling to find participants who could offer comprehensive and in-depth information about the topic being investigated, specifically regarding the development and evaluation of patient medication profiles in community pharmacies in Koronadal City. On the other hand, the researchers used the preferences of the respondents to choose them from their sampling frame. The goal of purposive sampling is to produce a sample that is reasonably thought to be representative of the community. This is often achieved by selecting a non-random sample of elements that represent a cross-section of the population using expert information about the community.

RESULTS AND DISCUSSION

A. Knowledge

The level of knowledge among community pharmacists before and after use of computerized patient medications profiles were screened and analyzed in this study. Overall results are shown in table 1A using the Matrix of Interpretation below.

Mean interval	Category*	Interpretation
1.00 – 1.75	Very Low	Knowledge of respondents on computerized patients' medication profiling system is NEVER manifested
1.76 -2.50	Low	Knowledge of respondents on computerized patients' medication profiling system is RARELY manifested
2.51 – 3.25	High	Knowledge of respondents on computerized patients' medication profiling system is OFTENTIMES manifested
3.26 -4.00	Very High	Knowledge of respondents on computerized patients' medication profiling system is ALWAYS manifested

* Wibowo & Suyatmi, 2016

Table 1A Level of Knowledge

STATEMENT	Experimental Group				Control Group			
	BEFORE		AFTER		BEFORE		AFTER	
	Mean	Remarks	Mean	Remarks	Mean	Remarks	Mean	Remarks
1. Always inform the patient the right administration of the medicine even without the use of a profiling system.	3.73	Very high	3.87	Very high	3.73	Very high	3.07	High
2. Conduct fact finding when needed	3.47	Very high	3.60	Very high	3.47	Very high	3.67	Very high
3. Performs patient counseling to the customer with or without the Patient Medication Profile	3.73	Very high	3.73	Very high	3.73	Very high	3.80	Very high
4. Only understands and analyzes the patient's prescription whenever the patient medication profiling system is used.	2.00	Low	2.87	High	2.00	Low	3.33	High
5. Can evaluate the needs of the patient without the use of Patient Medication profiling system	3.00	High	3.00	High	3.00	High	3.13	High
Overall Mean	**3.19**	**High**	**3.41**	**Very high**	**3.53**	**Very high**	**3.13**	**High**

As shown in table 1A, the overall results of the survey indicated that there is a substantial increase in the level of knowledge among community pharmacies before and after the utilization of computerized patients' medications profiles with a mean value of 3.19 (high) and 3.41 (Very high), respectively. This means that a computerized patient medication profile was effective in terms of identifying patients' right administration of medicine, fact finding of patients when required, patient counseling, understanding patients' prescription, and evaluating the need of the patient.

The introduction of pharmacist knowledge into patient medication profiling does seamlessly aligns with healthcare policies which encourage patient-centered care, pharmaceutical treatment management, and collaborative practice models. (Centers for Medicare & Medicaid Services, 2020). It also provides valuable insights into medication effectiveness, potential interactions, and therapy optimization (Houle et al., 2016). Apart from that, American Pharmacists' Association (2019) also stated that the pharmacists' knowledge enhances the identification of potential drug interactions within patient medication profiles, enabling timely interventions and mitigating the risk of adverse reactions.

B. Level of Perception

Pharmacist are expected to possess positive perception of profiling effectively their patients for better monitoring of patient's health. According to Porterfield et al. (2014), this type of profiling system has reduced prescription errors and drug mistakes and led to a drop in pharmacies calling back to doctors to ask for an explanation. With these, the researchers surveyed the level of perception among pharmacists before and after implementation of the patient medication profiling system; overall results are shown in table 1B.

Table 1B Level of Perception

STATEMENT	Experimental Group				Control Group			
	BEFORE		AFTER		BEFORE		AFTER	
	Mean	Remarks	Mean	Remarks	Mean	Remarks	Mean	Remarks
1. Patient Medication profiling system is better than the written patient medication profile.	3.53	Very high	3.53	Very high	3.53	Very high	3.12	High
2. Encoding information using a computer is more efficient than manually writing it in a paper.	3.73	Very high	3.73	Very high	3.73	Very high	3.73	Very high
3. It is complicated to use the Patient Medication Profiling system.	2.27	Low	2.27	Low	2.27	Low	2.71	High
4. There is relevance in substituting Patient Medication Profiling System than Patient Medication Profile	3.20	High	3.20	High	3.20	High	3.60	Very high
5. A Profiling system can provide quality services to the patient.	3.73	Very high	3.53	Very high	3.73	Very high	3.40	Very high
Overall Mean	**3.29**	**Very high**	**3.25**	**High**	**3.29**	Very high	**3.31**	Very high

The overall results of the survey indicated that there is no substantial increase in the level of Perception among community pharmacies before and after the utilization of computerized patients' medications profiles with a mean value of 3.29 and 3.25, respectively. According to Johnson et al., 2015, some studies have indicated that the limited training and familiarity among community pharmacists in using computerized patients' medication profiles may impede a substantial increase in perception, as these pharmacists may not fully grasp the system's functionalities and benefits yet. Moreover, the lack of technical support for community pharmacists during the implementation and utilization of computerized medication profiles has been identified as one of the factors that may be influencing the perceived effectiveness of the system (Dobbins et al., 2018).

 Both mean values before and after utilized in computerized patients' medication profiles have the descriptive equivalent of "high". Based on the results, the patient medication profiling cannot be considered better to the current paper-based practice employed in

the community pharmacies since resource-limited environments, particularly in developing countries, the perceived flexibility and adaptability of paper-based systems may be seen as advantageous due to fewer infrastructural requirements (AbouZahr et al., 2015). While some argues that paper-based patient profiling requires less initial training for healthcare professionals, allowing for quicker integration into existing workflows (Berg et al., 2018). Meanwhile, most of the respondents affirmed that there is relevance in substituting Patient Medication Profiling System than Patient Medication Profile and the Profiling system can provide quality services to the patient.

C. Satisfaction

Pharmacists are expected to possess positive satisfaction of medication profiling systems to enhance the efficiency of pharmacists' work, resulting in increased satisfaction in their ability to provide optimal pharmaceutical care. With these, the researchers surveyed the level of satisfaction among pharmacists before and after implementation of the patient medication profiling system; overall results are shown in table 1C.

Table 1C Satisfaction

| STATEMENT | Experimental Group | | | | Control Group | | | |
| | BEFORE | | AFTER | | BEFORE | | AFTER | |
	Mean	Remarks	Mean	Remarks	Mean	Remarks	Mean	Remarks
1. I want to recommend the system to my friends and families	3.33	Very high	3.47	Very high	3.33	Very high	3.80	Very high
2. The system plays an accurate role in medication profiling.	3.40	Very high	3.67	Very high	3.40	Very high	3.67	Very high
3. Image contrast was satisfying	3.33	Very high	3.47	Very high	3.33	Very high	3.60	Very high
4. The detailed view is helpful as a basis to create a diagnosis to the patient	3.40	Very high	3.53	Very high	3.40	Very high	3.87	Very high
5. Speed and reliability of the system is satisfying	3.53	Very high	3.60	Very high	3.53	Very high	3.13	High
Overall Mean	**3.40**	**Very high**	**3.55**	**Very high**	**3.40**	**Very high**	**3.61**	**Very high**

As depicted in Table 1C, the overall results of the survey indicated a substantial increase in the level of satisfaction among community pharmacies before and after the utilization of computerized patient medication profiles, with a mean value of 3.40 and 3.55, respectively. This means that while the computerized patient medication profile was effective in terms of accuracy, satisfaction of use,

helpfulness, and reliability, the current paper-based system is still enough to handle patient inquiries and assess patients' profiles.

According to Al-Rashed et al., 2012, Patient satisfaction is correlated with increased communication with healthcare providers facilitated by profiling systems, enabling discussions about treatment options, potential side effects, and addressing any concerns or questions patients may have. On the other hand, according to a study by Holden et al., 2013, the patient's satisfaction is positively influenced by the role of profiling systems in minimizing medication errors, ensuring precision in prescription management and reducing the likelihood of adverse events, instilling confidence in patients.

D. Adaptation

Pharmacists are expected to possess positive results in adaptation to enhance medication management and patient care. By utilizing

electronic systems, pharmacists can easily access comprehensive patient medication profiles.

Table 1D Adaptation

STATEMENT	Experimental Group				Control Group			
	BEFORE		AFTER		BEFORE		AFTER	
	Mean	Remarks	Mean	Remarks	Mean	Remarks	Mean	Remarks
1. The availability of technological infrastructure affects the adaptation and sustainability of the patient medication profiling system in community pharmacies within Koronadal City.	3.53	Very high	3.13	High	3.53	Very high	3.47	Very high
2. Adequate training and education for pharmacists and staff members affects the adaptation and sustainability of patient medication profiling system in community pharmacies within Koronadal City	3.73	Very high	3.33	Very high	3.73	Very high	3.53	Very high
3. Legal and ethical considerations affect the adaptation and sustainability of patient medication profiling system in community pharmacies within Koronadal City	3.33	Very high	3.00	High	3.33	Very high	3.53	Very high
4. Interoperability with other healthcare systems affects the adaptation and sustainability of patient medication profiling systems in community pharmacies within Koronadal City."	3.40	Very high	2.93	High	3.40	Very high	3.60	Very high
5. Financial resources affect the adaptation and sustainability of the patient medication profiling system in community pharmacies within Koronadal City."	3.60	Very high	3.00	High	3.60	Very high	3.47	Very high
Overall Mean	**3.52**	**Very high**	**3.08**	**High**	**3.52**	**Very high**	**3.52**	**Very high**

As depicted in Table 1D, the overall results of the survey indicated that there was no substantial increase in adaptation of computerized patient medication profiles, with a mean value of 3.52 and 3.10, respectively. This means that while the computerized patient medication profile was effective in terms of accuracy, satisfaction of use, helpfulness, and reliability, the current mechanism in place to track and identify patients' needs and medications is not effective in assessing patients' profiles. According to Hartmann et al., 2019, Economic constraints and challenges in resource allocation for the implementation of computerized medication profiles have been identified as barriers, hindering healthcare professionals from fully embracing the technology and experiencing a notable improvement in adaptation

Table 2. Testing the Significant Difference between Community Pharmacies Before and After using the Patient Medication profiling System

To determine if there is an existing significant difference on the level of Knowledge, Perception, Satisfaction, and Adaptation of computerized patients' medication profiling, a dependent t test was utilized, and results are shown in tables 2 and 3.

Test Variables	Before	After	T value	P value	Remarks*
Knowledge	3.19 (Range: 2.00-3.73)	3.42 (Range: 2.87-3.87)	1.3960	0.2352	Not significant
Perception	3.29 (Range: 2.27-3.73)	3.25 (Range: 2.27-3.73)	1.000	0.3739	Not significant
Satisfaction	3.40 (Range: 3.33-3.53)	3.55 (Range: 3.47-3.67)	4.5856	0.0101	Significant
Adaptation	3.52 (Range: 3.33-3.73)	3.08 (Range: 2.93-3.33)	9.6245	0.0007	Significant

*Calculation was performed at 0.05 level of significance

Statistical analysis showed that there was no significant difference ($p > 0.05$) in the level of knowledge and perception among respondents before and after intervention with computerized patient medication profiling. Meanwhile, there is a significant difference (p 0.05) in the level of satisfaction and factors for adaptation to computerized patient medication profiling before and after intervention. This means that the community finds it important that the computerized system was utilized in community pharmacies to effectively assess patients' profiles in terms of type of medication, required intervention, and other clinical interventions.

By giving a clear image of the patient's most recent vital signs, test results, and diagnoses that support the prescription of a particular drug, the addition of EHR access would enable a comprehensive picture of the care each patient receives in both inpatient and

outpatient medical settings. Furthermore, the community pharmacist's ability to support the patient's primary care physician with the proper escalation or de-escalation of medicine for chronic illnesses is enhanced by EHR access (Krauss et al., 2022).

Table 3. Testing the Significant Different Between Community Pharmacies Experimental and Controlled the Patient Medication profiling System

Test Variables	Experimental	Controlled	T – value	P value	Remarks*
Knowledge	3.42 (Range: 2.87-3.87)	3.43 (Range: 3.07-3.80)	0.0648	0.9514	Not significant
Perception	3.25 (Range: 2.27-3.73)	3.31 (Range: 2.71-3.73)	0.3719	0.7288	Not significant
Satisfaction	3.55 (Range: 3.47-3.67)	3.61 (Range: 3.13-3.87)	0.4447	0.6795	Not significant
Adaptation	3.08 (Range: 2.93-3.33)	3.52 (Range: 3.47-3.60)	5.4933	0.0054	Significant

*Calculation was performed at 0.05 level of significance

Statistical analysis showed that there is no significant difference (p > 0.05) on the level of knowledge, perception, and satisfaction between the experimental and control groups using computerized patient medication profiling as an intervention tool. Meanwhile, there is a significant difference (p 0.05) in adaptation of computerized patient medication profiling before and after intervention. This means that the community finds it important that the computerized system was utilized in community pharmacies to effectively assess patients' profiles in terms of type of medication, required intervention, and other clinical interventions.

Keller (2015) stated that some pharmacies are starting to transition toward using computerized patient medication records. The authors had to come up with new ways to combat barriers because there was little published literature about the experience of community pharmacies using a computerized patient medication record. These difficulties as well as suggested methods for overcoming them are maintaining open communication with collaborators, determining the goals for the new practice model, providing necessary ICT training, and integrating the PMPS and medication dispensing systems.

Level of Effectiveness

Table 4 revealed the level of effectiveness of patients' medication profiling system on the delivery of pharmaceutical care among community pharmacists in Koronadal City. The descriptive analysis was done based on the four domains of the study that includes knowledge, perception, satisfaction, and factors on effectiveness of the intervention on subjects that underwent intervention.

TABLE 4
Level of Effectiveness of Patient Medication profiling System
Intervention in the Community Pharmacy

Test Variables	Mean Response	Description	Interpretation
Knowledge	3.42	Very High	Knowledge of respondents on computerized patients' medication profiling system is ALWAYS manifested
Perception	3.25	High	Perception of respondents on computerized patients' medication profiling system is OFTEN TIMES manifested
Satisfaction	3.55	Very High	Satisfaction of respondents on computerized patients' medication profiling system is ALWAYS manifested
Adaptation	3.08	High	Adaptation of respondents on computerized patients' medication profiling system is OFTENTIMES manifested

Mean range: 1.00-1.75 (very low), 1.76-2.50 (low) 2.51-3.25 (high), 3.26-4.00 (very high)

Results of the study revealed that respondents found the effectiveness of patient medication profiling system intervention on the delivery of pharmaceutical care among community pharmacists in Koronadal City.

It is found In 2013, Ojeleye discovered that electronic Patient Medication Record systems are effective at identifying and minimizing potential issues and hazards at the point of pharmacy order entry. You can complete searches, censuses, and research in a matter of seconds using this system. There was insufficient information to allow an adequate comparison of the safety aspects investigated across practice domains or studies due to the lack of pertinent investigations.

Additional research is required to determine the efficacy of PMPS, such as therapeutic duplication, and drug allergy screening. It can

be difficult to find acceptable answers to these issues, but maintaining patient safety and strengthening the safety net are of utmost

importance.

CONCLUSION

The purpose of this study was to determine how community pharmacists in Koronadal City are developing and accessing patient medication profile systems in relation to the provision of pharmaceutical care. With the help of the study, the researcher may ascertain whether the Patient Medication Profiling System is useful in community pharmacies and can also pinpoint any notable differences between its use and non-use. Using computerized patient medication profiles as an intervention tool, the experimental and control groups' knowledge, perception, and satisfaction levels did not differ significantly ($p > 0.05$). In the meantime, there is a significant difference ($p < 0.05$) between the pre- and post-intervention parameters for the computerized patient's medication profiling adaptation. Some writers have pointed out possible drawbacks with the Patient Medication Profiling approach, despite the fact that the body of research on the subject is expanding. Workflow adjustments, monetary problems, privacy and security worries, and a few unintentional worries are among them.

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