



Challenges Encountered by Elderly Patients on their Medications: Basis for Development of Medication Application system

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ABSTRACT

Challenges Encountered by Elderly Patients on their Medications in Bongabong Oriental Mindoro: Basis for Medication Application aimed to investigate the challenges faced by elderly patients in connection to their medication management in Bongabong, Oriental Mindoro. A quantitative research approach was employed, involving a self-administered survey questionnaire distributed to a convenience sample of elderly patients in Bongabong, Oriental Mindoro. The results revealed that the elderly patients generally had a positive status, with a weighted mean score of 3.90 for feeling physically healthy, 4.50 for the ability to perform daily activities independently, and 4.00 for mental well-being. However, challenges in medication management were identified, including occasional forgetfulness (weighted mean score of 2.90), confusion about dosage or frequency (weighted mean score of 3.50), and some discomfort in asking questions about medications (weighted mean score of 3.90). The effectiveness of technology solutions in addressing these challenges yielded mixed perceptions among the respondents, with a neutral response (weighted mean score of 3.20) regarding its helpfulness in managing medications independently, agreement (weighted mean score of 3.50) on improved understanding of medication instructions, and another neutral response (weighted mean score of 3.20) regarding its impact on medication adherence. These findings highlight the importance of addressing medication management challenges for elderly patients and suggest the need for tailored interventions. By developing targeted solutions such as medication reminders, simplified instructions, patient education, and improved communication, healthcare professionals, policymakers, and technology developers can enhance medication management, improve the quality of care, and ensure medication safety for the elderly population in Bongabong, Oriental Mindoro.

INTRODUCTION

It is crucial to address the challenges faced by elderly patients, especially when it comes to managing their medications. Medications are vital in improving health and quality of life, but it can be difficult for elders to manage multiple prescriptions and complex drug regimens. At a rate of about 50 incidents per 1000 person-years, adverse medication effects, which are unintended, unpleasant, or harmful outcomes, are common among ambulatory people 65 years old and older. This demonstrates how common drug-related problems are in this population. Hospitalization rates for adverse medication reactions are four times greater in elderly individuals (about 17%) than in younger people (4%), according to research. Warfarin, insulin, oral antiplatelet medications, and oral hypoglycemic medications account for 66% of these hospitalizations among older individuals (Ruscin & Linnebur, 2021). Understanding and addressing these challenges are crucial to improving medication management, reducing adverse drug effects, and enhancing the quality of care for elderly patients in Bongabong, Oriental Mindoro. Recent technological advancements have significantly impacted the healthcare sector, providing healthcare professionals with various tools and applications to manage and connect with patients and caregivers. These advancements have improved accessibility, effectiveness, and quality of healthcare. The study conducted by Roeleveld N. et al. (2018) highlights the importance of using high-quality mobile apps for blood pressure self-management to enhance patient care. To ensure appropriate blood pressure monitoring, it is crucial to consider the reliability and validity of the apps utilized in the proposed project. To ascertain the quality and accuracy of the accessible apps, evaluation is required. Creating a new app specifically for the project could be essential if there are not enough high-quality apps available. It is important to pay particular attention to medication management issues for elderly individuals, especially in rural regions like Bongabong, Oriental Mindoro. To ensure that healthcare policies are effectively implemented and lead to improved quality of care.

According to Saghaeiannejad-Isfahani et al. (2017), mobile apps such as "Seeb" that remind users to take their medications can significantly impact patient health outcomes. The authors recommend that healthcare professionals promote medication reminder apps and raise patient awareness about them, as they can improve medication adherence and reduce the risk of medication errors. Proper medication management can help improve patient safety and treatment outcomes and reduce health costs. It involves a collaborative effort among healthcare providers, patients, and caregivers to ensure that medications are used appropriately and effectively. Elderly patients in Bongabong Oriental Mindoro are facing challenges with the current medication management. This study aims to answer the following questions: the status of elderly patients in Bongabong Oriental Mindoro? challenges encountered by elderly patients in terms of their medication management? How can technology solutions help address the challenges faced by elderly patients in managing their medications?

The scope of the study will focus on the challenges encountered by elderly patients with their medications in Bongabong, Oriental Mindoro, the basis for the development of medication application.

Researchers will randomly select ten elderly patients with high blood pressure and taking their maintenance medication, particularly in Bongabong. And also, to determine the challenges that elderly patients face in managing their medications. Specifically, elderly patients aged 60 or above were the respondents of this study.

Conceptual/Theoretical Framework/Methodology of the Study

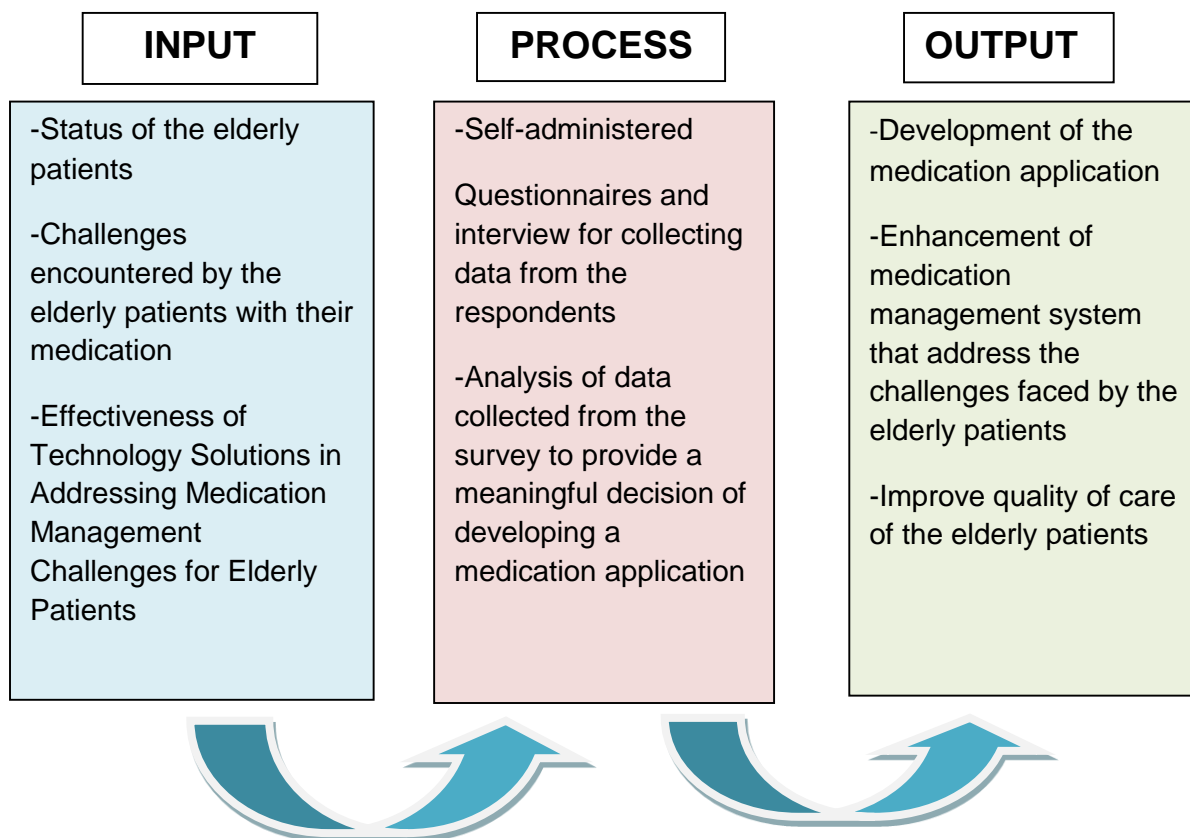


Figure 1. Conceptual Framework of the Study

The IPO model in this study involves elderly patients in Bongabong, Oriental Mindoro, and begins with the input stage, which includes the status assessment of elderly patients and identifying challenges they face and the effectiveness of technology solutions in addressing challenges in medications of elderly patients. The input also involves using self-administered questionnaires and interviews to collect data from elderly patients. The process involves analyzing the collected data to gain insights into the challenges and potential solutions. Finally, the output stage involves developing a medication application that addresses the identified challenges, enhancement of medication management and improved the quality of care for elderly patients. This application is a technological solution to improve medication management among elderly patients.

Theoretical Framework

In this study, researchers aimed to determine the challenges that elderly patients have encountered in managing their medications.

The Social Cognitive Theory (SCT) and the Technology Acceptance Model (TAM) can be effectively combined as a suitable theoretical framework for this study on medication management and patients' behaviors. SCT emphasizes the interplay between cognitive processes, social factors, and environmental influences, including patients' beliefs, expectations, and self-efficacy. TAM complements SCT by focusing on the factors that influence the acceptance and adoption of technology. By integrating both theories, this study can comprehensively explore how patients' thoughts, perceptions, and attitudes toward the medication systems and the perceived usefulness and ease of use from TAM influence their behaviors, adoption, and utilization. This combination offers a holistic understanding of patients' acceptance and engagement with the medication management system, providing valuable insights for improving medication management practices.

LITERATURE REVIEW

In this chapter different local and worldwide literature and studies is shown to provide insights about the advantages of using mobile applications and medication management system in managing medications. Older patients prefer verbal medication safety behaviors such as asking questions and reporting medication errors to healthcare professionals. The young-old age group is particularly interested in identifying medication errors. Healthcare professionals and organizations should encourage and support older patients' engagement in medication safety behaviors to minimize medication harm (Grealish et al., 2021).

Designing healthcare apps, particularly for specific medical conditions like Alzheimer's disease, is complex. The co-design process, involving collaboration with healthcare professionals and patients, ensures that the apps meet the needs of users and providers. It fosters group endorsement, prevents resistance to change, and ensures the app's usefulness. User involvement in the design process guarantees user-friendliness and meeting user needs, while evaluation by uninvolved users offers fresh perspectives and identifies areas for improvement. This iterative process is vital for developing effective healthcare apps that meet the needs of both users and healthcare providers. (Chavez et al., 2019). According to the STOPP version 2 criteria, 39% of hospitalized older individuals received potentially inappropriate drugs (PIMs), according to a cross-sectional study in a tertiary teaching hospital in the Philippines. Polypharmacy was substantially correlated with this incidence of PIM. The study (Giron et al., N. P., 2020) emphasizes the significance of increasing awareness about proper drug prescribing practices in the care and management of elderly patients. In this sample of hospitalized older persons, PIM using STOPP version 2 was prevalent (39%), and it was substantially correlated with polypharmacy. Medications in treating and managing elderly individuals requires more public awareness (Garcia et al., S. P., 2022). According to Feng et al. (2021), their conducted study offers proof that integrating family members in the management of chronic illnesses such as Type 2 Diabetes Mellitus can improve

patient outcomes, while the use of mobile apps for medication management has been shown to improve patient outcomes and engagement with treatment (Tabi et al., 2019). A recent study found that medication reminder apps can be particularly effective, providing patients with personalized support and helping them follow their treatment plans. However, the study highlighted the challenges of finding a suitable medication management app. With hundreds of options available in app stores, it can be difficult for patients to find a trustworthy and reliable app. A mobile application can improve the precision and effectiveness of radiotherapy treatment, benefiting both patients and healthcare professionals. It addresses the need for innovative technology-based interventions in healthcare, similar to the mobile application developed in the study. Ongoing updates and improvements are emphasized to enhance the effectiveness of the intervention in patient care (Gh, A., 2020; Gh, A. et al., 2020). Mobile health apps can benefit patients by providing access to health information, making communication with physicians more convenient, ensuring transparency in medical charges, and improving short-term outcomes. To improve patient experience, we should encourage the use of mobile health apps in healthcare settings. Using mobile health apps can provide patients with easy access to important health-related information, making it easier for them to take control of their health. It can also make communication with physicians more convenient and transparent, allowing patients to clearly understand their medical charges (Thorat & Kulkarni, 2019). An IoT medication adherence manager hardware device designed to improve medication adherence among patients by digitizing the medication consumption process. The device provides visual and audio reminders and logs medication intake time to reduce unintentional non-adherence due to forgetfulness (Fathillah & Chellappan, 2022). The study reviewed the currently available mobile health apps for dementia, particularly Alzheimer's disease, and their potential benefits for patients and caregivers. The study found that mobile health apps can be used for cognitive training, monitoring, screening, socialization, reminiscence, and tracking (Yousaf K. et al., 2019). Overall, studies suggests that the implementation and use of medication management tools or application can help to improve the medication management of the medication management of the patients in terms of enhancing medication adherence, reducing medication errors, promoting patient education and empowerment, facilitating communication between healthcare providers and patients, and ultimately improving overall treatment outcomes and patient safety.

METHODOLOGY

This section covers the research setting, methodology, population sampling or study participants, research instrument, and statistical data analysis.

Research Design

In this quantitative research study, we are investigating the challenges encountered to the medication management of elderly patients in Bongabong. Our approach involves distributing a self-administrated survey questionnaire to collect numerical data on challenges encountered by the elderly patients with

their medications. The collected data will be analyzed using descriptive statistics to summarize medication problems face by the elderly patients.

Using a quantitative research approach and statistical analysis, this study aims to provide quantifiable findings that can enhance medication management for elderly patients in Bongabong. Researchers can develop an application that effectively supports their medication needs and preferences by understanding their medication concerns and considering demographic factors.

Research Locale

The chosen research locale for this study is Bongabong, a coastal municipality in Oriental Mindoro, Philippines. Bongabong represents a typical rural town in the country, facing challenges in healthcare access and medication management. Researchers conducted a survey only in the area of Bongabong where respondents are randomly selected based on their availability to answer the questionnaire.

Respondents of the Study

The target population in this study are elderly patients in Bongabong, Oriental Mindoro, Philippines. Participants will be selected through convenience sampling, which allows for practicality, cost-effectiveness, and a relatively large sample size. At least ten elderly patients will be included to ensure sufficient data for analysis and meaningful conclusions. However, it is essential to note that convenience sampling may not provide a representative sample of the entire population, as participants are chosen based on availability and accessibility.

The researchers will randomly select participants who are 50 years old and above and approach them based on their willingness to be part of this study. The sample frame will include patients in Bongabong who are easily reachable and interested in the study. While convenience sampling offers practicality, the results obtained may only partially reflect the characteristics of the entire population. Nevertheless, by selecting diverse participants from different backgrounds, the researchers aim to capture a broad perspective on medication management in Bongabong.

Research Instrument

In this study, a self-made administered questionnaire and interviews will be used as the research instrument to collect data on medication management among elderly individuals in Bongabong Oriental Mindoro. The questionnaire will cover the status of the elderly patients, challenges faced with their medications, and the effectiveness of technology solutions to enhance the medication management of elderly patients. Participants will have the flexibility to answer the questions at their convenience without the need for direct interaction with a researcher. Therefore, researchers will have an interview with the respondents in order to know the status of the elderly patients. The collected data will be analyzed using descriptive analysis, which involves calculating statistical measures to summarize the information and gain insights into demographic characteristics, variables, and problems related to medication management among the elderly population in Bongabong.

The **Likert scale** was used to assess the perceptions of the participants regarding medication-related problems and challenges elderly patients encountered.

Table 1. Likert Scale Analysis Table

Rate	Range	Description
5	4.50 – 5.00	Strongly Agree (SA)
4	3.50 – 4.49	Agree (A)
3	2.50 – 3.49	Neutral (N)
2	1.50 – 2.49	Disagree (D)
1	1.00 – 1.49	Strongly Disagree (SD)

Statistical Treatment of Data

The collected data in this study will undergo statistical analysis using descriptive statistics. Descriptive statistics will summarize and describe the data, providing insights into medication management practices among the elderly population in Bongabong. The results will be presented through tables and graphs, and the research report will provide a comprehensive explanation and interpretation of the findings, offering valuable insights into medication management among the elderly in Bongabong.

Ranking is used to determine which of the challenges elderly patients most encountered with their medications.

The "**mean**" represents the average score obtained from the Likert scale responses, providing a measure of central tendency to assess the general agreement or disagreement among participants for each statement in the survey.

RESULTS

In this section of a research study where the collected data is analyzed and interpreted, presenting the findings in relation to the research objectives and providing insights into the research questions.

1. What is the status of elderly patients in Bongabong Oriental Mindoro?

Table 2 shows the status of elderly patients in Bongabong, Oriental Mindoro appears to be generally positive. It provides weighted mean scores for three aspects of well-being: physical health, ability to perform daily activities independently, and mental/emotional well-being. The scores are accompanied by descriptions and ranks.

For the aspect of feeling physically healthy, the weighted mean score is 3.90, indicating that the respondents generally agreed with this statement. This suggests that, on average, the elderly patients perceive themselves to be in good physical health.

Regarding the ability to perform daily activities independently, the highest mean score of 4.50 suggests strong agreement among the respondents. This indicates that the elderly patients feel confident and capable of carrying out essential tasks like bathing, dressing, and eating without assistance.

In terms of mental well-being and emotional stability, the weighted mean score is 4.00, indicating average agreement. This suggests that the elderly patients generally feel mentally well and emotionally stable, which is a positive indicator of their overall psychological state.

The overall mean score of 4.13 falls within the "Agree" category, further supporting the idea that the majority of elderly patients in Bongabong, Oriental Mindoro have a favorable status.

Table 2. Status of the Elderly Patients

Item	Weighted Mean	Rank	Description
1. I feel physically healthy.	3.90	2	Agree
2. I am able to perform daily activities independently (e.g., bathing, dressing, eating).	4.50	1	Strongly Agree
3. I feel mentally well and emotionally stable.	4.00	3	Agree
Overall Mean	4.13		Agree

2. What are the challenges encountered by elderly patients in terms of their medication management?

Table 3 presents the challenges encountered by elderly patients in terms of their medication management including forgetting to take medications, experiencing confusion about dosage or frequency, and feeling uncomfortable asking questions about their medications.

The first challenge identified is that elderly patients sometimes forget to take their medications, as indicated by a weighted mean score of 2.90, which falls within the "Neutral" category. This suggests that the respondents neither strongly agreed nor disagreed with this statement. It implies that some elderly patients may struggle with medication adherence and may occasionally forget to take their prescribed medications.

The second challenge is related to confusion about the dosage or frequency of medications, as indicated by a weighted mean score of 3.50, falling within the "Agree" category. This indicates that the respondents generally agreed that they experience confusion regarding the correct dosage or frequency of their medications. This confusion may arise due to complex medication regimens, multiple prescriptions, or inadequate understanding of instructions.

The third challenge identified is that some elderly patients feel comfortable asking questions about their medications, as indicated by a weighted mean score of 3.90, falling within the "Agree" category. This suggests that respondents generally agreed that they do not face significant barriers when it comes to seeking clarification or information about their medications. This indicates that elderly patients feel relatively comfortable asking questions and seeking the necessary information about their medications.

The overall mean score of 3.43 indicates a slightly neutral stance among the respondents regarding the challenges encountered in medication management. Therefore, it is important to address these challenges to ensure the proper management of medications among elderly patients. Interventions such as medication reminders, simplified medication instructions, patient education, and improved communication between healthcare providers and patients can

help mitigate these challenges and improve medication adherence and safety for the elderly population.

Table 3. Challenges Encountered by Elderly Patients in Terms of Their Medication Management

Item	Weighted Mean	Rank	Description
1. I sometimes forget to take my medications.	2.90	3	Neutral
2. I experience confusion about the dosage or frequency of my medications.	3.50	2	Agree
3. I feel comfortable asking questions about my medications.	3.90	1	Agree
Overall Mean	3.43		Neutral

3. How can technology solutions help addressed the challenges faced by the elderly patients in managing their medications?

Table 4 presents the effectiveness of technology solutions in addressing medication management challenges for elderly patients. The weighted mean scores and descriptions provide insights into the perceptions of the respondents.

Regarding the helpfulness of technology solutions in managing medications independently, the weighted mean score of 3.20 indicates a neutral response. This suggests that the elderly patients have mixed opinions or experiences regarding the effectiveness of technology in enabling them to manage their medications without assistance.

In terms of understanding medication instructions, the weighted mean score of 3.50 suggests agreement on average. This indicates that the respondents generally agreed that technology solutions have improved their understanding of how to take their medications correctly.

Regarding medication adherence, the weighted mean score of 3.20 again indicates a neutral response. The effectiveness of technology solutions in helping elderly patients remember to take their medications as prescribed is perceived neither strongly positively nor negatively.

Considering the overall mean score of 3.30, which falls within the "Neutral" category, it suggests that elderly patients have a mixed perception of the effectiveness of technology solutions in addressing medication management challenges. While they acknowledge some benefits, such as an improved understanding of medication instructions, they are less certain about the extent to which technology solutions help them manage their medications independently or remember to take them as prescribed.

Table 4. Effectiveness of Technology Solutions in Addressing Medication Management Challenges for Elderly Patients

Item	Weighted Mean	Rank	Description
1. I find technology solutions helpful in managing my medications independently without requiring assistance or support from others.	3.20	2.5	Neutral
2. Technology solutions have improved my understanding of medication instructions.	3.50	1	Agree
3. Using technology solutions has helped me remember to take my medications as prescribed.	3.20	2.5	Neutral
Overall Mean	3.30		Neutral

DISCUSSION

The study focused on the status of elderly patients in Bongabong, Oriental Mindoro, their challenges in medication management, and the potential role of technology solutions. The findings indicate:

Status of Elderly Patients

1. Elderly patients generally have a positive status in terms of physical health, independent daily activities, and mental/emotional well-being.
2. The overall mean score of 4.13 suggests a favorable status among elderly patients.

Challenges in Medication Management

1. Challenges faced by elderly patients include occasional forgetfulness, confusion about medication dosage or frequency, and comfort levels in asking questions about medications.
2. The overall mean score of 3.43 indicates a slightly neutral stance toward these challenges.

Role of Technology Solutions

1. Technology solutions have the potential to address medication management challenges.
2. The effectiveness of technology solutions in managing medications independently receives a neutral response.
3. Technology solutions have improved understanding of medication instructions, but their impact on medication adherence is perceived neutrally.

CONCLUSION

Based on the findings presented in Chapter IV, several conclusions are drawn regarding the status of elderly patients in Bongabong, Oriental Mindoro, the challenges they face in medication management, and the potential role of technology solutions in addressing these challenges. Status of Elderly Patients showed in table 2 indicates that the overall status of elderly patients in Bongabong, Oriental Mindoro is generally positive. They perceive themselves to be physically healthy, capable of performing daily activities independently, and mentally well and emotionally stable. Challenges in Medication Management showed in Table 3, highlights the challenges encountered by elderly patients in medication management including forgetting to take medications, experiencing confusion about dosage or frequency, and feeling uncomfortable asking questions about their medications emphasize the importance of addressing these challenges to ensure proper medication adherence and management among elderly patients. Technology solutions have shown potential in addressing challenges, particularly in improving the understanding of medication instructions. However, their overall effectiveness in supporting medication management among elderly patients requires further exploration and development. Future interventions should aim to address these challenges and leverage technology solutions to enhance medication management and improve the well-being of elderly patients in the area.

RECOMMENDATIONS

The recommendations given were based on the conclusions provided for future researchers. Conduct further research to explore the factors contributing to the positive status of elderly patients in Bongabong, Oriental Mindoro, such as specific health and lifestyle factors that may influence their physical health, independence, and mental well-being. Conduct studies to evaluate the impact of educational programs and support systems for elderly patients, including training on technology use and ongoing technical assistance, to enhance their understanding and utilization of medication management tools. Investigate interventions that specifically target medication adherence challenges among elderly patients, focusing on strategies to improve medication reminders, simplify dosage instructions, and enhance communication regarding their medications.

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