Effectiveness of VoxQR (Voice QR Code) In Enhancing Knowledge Medication Adherence for Geriatric Hypertensive Patients in Koronadal City

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ABSTRACT

This study examined the effectiveness of VoxQR (Voice-powered QR codes) in enhancing knowledge and medication adherence among geriatric hypertensive patients in Koronadal City, where nonadherence to antihypertensive medication is a common issue due to cognitive decline and difficulty understanding treatment regimens. A quasi-experimental design was employed, and patients aged 60 and above were selected using purposive sampling. Data were gathered using a validated questionnaire that measured adherence and knowledge before and after the intervention. Results showed notable improvements, including a shift in medication adherence from moderate-low to moderate high levels, increased understanding of medication purpose, dosage, and timing. These findings indicate that VoxQR significantly enhanced medication adherence and knowledge, suggesting that voice-based QR technology is a practical and accessible tool for supporting chronic disease management in older adults.

Keywords: VoxQR, medication adherence, knowledge, geriatric hypertension, quasi experimental.

INTRODUCTION

Background of the Study

Medication adherence among elderly hypertensive patients is considered a public health concern, this is given the incidence of hypertension increasing in most older adults. Studies on nonadherence have linked it to health complications arising from it such as heightened risks of cardiovascular events and other hospital admissions. It has been reported by research that in elderly patients, adherence is pretty low-20% to 50% on average (Yazdanpanah et al., 2019; Saqlain et al., 2019). Contributing factors to this dilemma are cognitive decline, complex drug regimens, and poor health literacy. Inadequate communication regarding prescription information makes matters worse, so there is a pressing need for interventions that may be tailored to help in improving adherence in such vulnerable populations.

The issues involving adherence to medication in the Philippines are both internal and national. Socioeconomic status contributed much to this issue because a significant number of elderly patients find themselves in financial situations where they cannot afford to pay for medications (Gutierrez & Sakulbumrungsil, 2021). Furthermore, cultural beliefs and misconceptions about hypertension and its treatment are a major barrier to adherence to medication. A systematic review indicated that Filipino elderly patients have lower health literacy, which markedly impacts their understanding of the treatment regimen (Mohajer, 2019; Gavrilova et al., 2019). These barriers should be implemented with educational programs being culturally sensitive and specific in the needs of elderly patients in the Philippines to efficiently improve medication adherence.

Though previous studies have already been done to identify medication adherence among hypertensive patients, still, significant gaps remain in understanding specific factors influencing adherence within the Filipino geriatric population. While there are numerous studies that have identified several determinants of medication adherence around the world, including mental health problems and socioeconomic factors (Poulter et al., 2020; Uchmanowicz et al., 2019), there is a dearth of localized studies that focus on the interaction of these factors in the Filipino elderly patient. Moreover, current literature seldom takes into consideration the effect of culturally

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unique beliefs and practices which can determine compliance-related behaviors (Pan et al., 2019; Sanati et al., 2020). Redress of the above will form the imperative step towards crafting interventions especially relevant for such a population that addresses individual concerns while improving outcomes for overall health of older hypertensives in the Philippines.

The urgency with this study is due to a high prevalence of hypertension in older Filipinos and current data indicating that this rate stands at about 69.1% among aged people (Abalos et al., 2024). Notably, although most aged people with hypertension understand the condition, only close to 61.6% recognize the **4** condition, hence untreated (Abalos et al., 2024). This calls for appropriate interventions that target and address the awareness and adherences among the aged populace. Other indirect benefits of this study are going to be elderly hypertensive patients who will be benefited by better support for controlling their condition and healthcare professionals who can use the information available to design culturally appropriate programs for education. Policymakers can also use insight from this study to shape public health initiatives focused on hypertension management in older adults, which will lead towards better health outcomes and saving healthcare costs related to the hypertension complications.

The researcher will then ensure that results are published through different means to impact a larger population. The researcher will initially prepare results for publication in peer-reviewed journals dealing with geriatric medicine and public health so that insights gained would be contributed to the overall academic discourse on medication adherence. Results will be presented to healthcare professionals and policymakers actively working in the management of hypertension at local and international conferences. The study also intends to collaborate with local healthcare institutions in preparing training modules based on findings that could be applied in community health programs.

This study's primary goal is to create VoxQR (Voice-powered QR codes) to enhance knowledge and medication adherence for geriatric hypertensive patients in Koronadal City. By leveraging this innovative technology, the study aims to provide elderly patients with accessible and comprehensible medication information, thereby improving their understanding and management of their treatment regimens.

REVIEW OF RELATED LITERATURE

Knowledge in Medication

Vreeland et al. (2022) pointed out that a large number of elderly Filipinos have little understanding of the functions, dosages, and possible adverse effects of their medications. With the complexity of treatment plans frequently recommended for treating hypertension, this ignorance can result in drug mistakes and adverse health outcomes. According to the study, older people typically understand their medical issues, but they frequently don't fully understand the pharmacological treatments that are available to them. Additionally, Vreeland et al. stress the necessity of improved communication between senior citizens and healthcare professionals, especially pharmacists. The findings suggest that many older adults do not fully utilize pharmacists as a resource for medication-related inquiries due to a lack of awareness about the pharmacists' role in patient education and counseling. This disconnect can hinder effective medication management and adherence.

Many people, even older persons, have misconceptions regarding how to use antibiotics appropriately, according to Vidad et al. (2022). For example, a sizable portion of respondents did not know the proper indications for antibiotic therapy or the possible repercussions of abuse. Given that older persons commonly use antibiotics to treat a variety of medical conditions, this ignorance is especially worrisome since they might not completely appreciate the significance of following recommended regimens or the dangers of self-medication. They contend that doctors and pharmacists, among other healthcare professionals, are essential in teaching patients about the appropriate use of antibiotics, possible adverse effects, and the significance of finishing recommended courses of treatment.

The assessment of medication errors among in-patients in the pulmonary medicine service of a tertiary government hospital raises serious questions about the effectiveness and safety of drug administration, especially for elderly patients in the Philippines, according to Abunales et al. (2024). According to the study, agerelated physiological changes, polypharmacy, and cognitive impairment might make it difficult for older persons to

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properly manage their prescriptions, making them especially susceptible to medication errors. The authors also discovered that the processes of prescription, administration, and recording were linked to a significant proportion of pharmaceutical errors. The widespread practice of polypharmacy, in which several medications are provided at the same time, increases the dangers for elderly people.

According to Giron and Cortes-Maramba (2020), the appropriateness of medication prescribing in hospitalized older adults in the Philippines is a pressing concern, particularly regarding the prevalence of medication errors. The study highlights that older patients are often at a higher risk for medication-related issues due to factors such as polypharmacy, age-related physiological changes, and cognitive impairments. These factors not only complicate their treatment regimen but also increase the likelihood of adverse drug events. Giron and CortesMaramba emphasize that medication errors among older adults can stem from several sources, including inadequate communication between healthcare providers and patients, insufficient patient education regarding medication use, and the complexities associated with managing multiple prescriptions. Many elderly patients may not fully understand their medication regimens or the importance of adherence, which can result in missed doses or incorrect usage.

Perez (2022) asserted that improving older persons' pharmaceutical knowledge, especially when it comes to treating chronic illnesses like hypertension, requires the inclusion of geriatric content in entry-level physical therapy courses in the Philippines. The study highlighted that the need for healthcare professionals, particularly physical therapists, to be knowledgeable about geriatric care and drug management is growing as the number of aged people continues to rise. According to the research, a large number of elderly people in the Philippines struggle with their medicine knowledge, which might result in mistakes and negative health consequences. Due to polypharmacy, older patients frequently have complicated drug schedules, therefore it's critical that they comprehend the functions, dosages, and possible adverse effects of their drugs.

Geriatric hypertensive patients in the Philippines

According to Abalos et al. (2024), the high prevalence of hypertension among older persons in the Philippines, along with inadequate levels of awareness, treatment, and management is a serious public health concern. Hypertension affected about 69.1% of older Filipinos; however, only 61.6% of those who have the ailment are aware of it, and a startling 51.5% do not receive treatment. This disparity in treatment and knowledge draws attention to important obstacles that support the ongoing problem of uncontrolled blood pressure in this population. The study also highlights the critical need for focused public health initiatives to raise older individuals' knowledge and treatment compliance. Despite existing government programs aimed at addressing hypertension, the authors advocate for enhanced efforts to engage older Filipinos in these initiatives to ensure better health outcomes.

The evaluation of patient knowledge regarding traditional cardiac drugs and herbal items among elderly patients living in the community in the Philippines revealed notable knowledge gaps that may affect medication adherence and general health outcomes (Jazul et al., 2021). According to the survey, a lot of older persons use both prescription drugs and herbal therapies, but they frequently don't know enough about them. This ignorance may result in pharmaceutical mistakes, inefficient treatment plans, and negative health outcomes. The results showed that although some patients knew what their prescribed drugs were for, many had trouble explaining their uses, dosages, and possible adverse effects. Furthermore, the study found that confusion often arose from the concurrent use of herbal products, which patients believed to be safe and effective without fully understanding their interactions with conventional medications.

The characteristics linked to medication adherence among hypertensive patients in the Philippines provide important insights into the difficulties older persons encounter in treating their hypertension, claim Gutierrez and Sakulbumrungsil (2021). The significance of enhancing patient-provider relationships and healthcare accessibility is one of the writers' main recommendations. They discovered that patients were substantially more likely to follow their prescription regimens if they reported having better access to healthcare services and having a good rapport with their healthcare providers. This implies that better adherence rates can result from increased trust and communication between patients and medical staff. This is especially important for older persons who can encounter extra obstacles like complicated prescription schedules or cognitive deterioration.

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The current state of adult hypertension care and therapy in the Philippines, according to Rosa et al. (2024), reveals important obstacles that lead to the high prevalence and poor control rates of this illness. The report highlights that, with only roughly 27% of hypertensive people maintaining sufficient blood pressure control and almost half of them being ignorant of their disease, hypertension continues to rank among the nation's major causes of morbidity and mortality. According to Rosa et al., better public health initiatives designed especially for senior citizens are desperately needed. In addition to educating patients about hypertension, they support improved awareness initiatives that promote consistent drug adherence and routine monitoring.

According to Sison, Cawed-Mende, and Oliva (2021), the prevalence, awareness, and treatment profile of adult Filipino hypertensive individuals reveal critical insights into the management of hypertension in the Philippines. The authors reported that awareness of hypertension among affected individuals is alarmingly low, with many not recognizing the importance of regular blood pressure monitoring and management. This lack of awareness contributes to poor treatment outcomes, as individuals may not seek medical advice or adhere to prescribed antihypertensive therapies. Furthermore, the study indicated that even among those diagnosed with hypertension, treatment adherence is often suboptimal due to various factors, including limited access to healthcare services, financial constraints, and a lack of education regarding the condition.

According to Yazdanpanah et al. (2019), enhancing medication adherence among geriatric hypertensive patients through educational programs based on the Health Belief Model (HBM) can significantly improve health outcomes in this vulnerable population. The study highlights that older adults often struggle with medication adherence due to various factors, including a lack of understanding about their condition, the importance of their medications, and the potential consequences of non-adherence. The findings from the study indicated that participants who received education based on the HBM showed significant improvements in their medication adherence compared to those who did not receive such training. This suggests that when older adults are made aware of their susceptibility to health issues related to hypertension and understand the serious implications of non-adherence, they are more likely to follow their prescribed treatment plans.

Suhat et al. (2022) emphasize that older adults often face unique challenges related to hypertension management, including cognitive decline, polypharmacy, and a lack of understanding about their medications. The HBM posits that individuals' perceptions of their susceptibility to a health issue, the severity of that issue, the benefits of taking action, and the barriers to taking action all play critical roles in determining their health behaviors. In the context of geriatric patients with hypertension, these perceptions can directly impact their willingness and ability to adhere to medication regimens. Suhat et al. found that older adults who perceived themselves as susceptible to the complications of hypertension and recognized the severity of their condition were more likely to adhere to their medications. Conversely, those who did not understand the risks associated with untreated hypertension or who believed that their medications would not significantly benefit them were less likely to follow their prescribed treatment plans. This underscores the importance of effective patient education tailored specifically for elderly individuals.

According to Oori et al. (2019), enhancing knowledge about medication adherence among geriatric patients with hypertension is crucial for improving health outcomes in this vulnerable population. Oori et al. emphasize the importance of knowledge as a foundational element for enhancing medication adherence. They argue that when older adults are well-informed about their medications—such as understanding their purpose, potential side effects, and the importance of adherence—they are more likely to follow their prescribed regimens. The authors suggest that healthcare providers should implement comprehensive educational programs that not only convey information about medications but also empower patients by improving their health literacy.

Saqlain et al. (2019) highlights the alarming rates of non-adherence among elderly hypertensive patients in Islamabad, Pakistan, emphasizing the need for targeted interventions to improve health literacy and support adherence. To improve medication adherence among geriatric hypertensive patients provide programs aimed at enhancing health literacy should be developed. These could include simplified educational materials about hypertension and its management tailored to the literacy levels of older adults. Healthcare providers should adopt a more patient-centered approach, ensure clear communication and understand between providers and patients regarding treatment plans. This includes using layman's terms when discussing medications and encouraging questions from patients.

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Hypertension is a prevalent condition among older adults, and effective management is crucial to prevent complications such as stroke and heart disease. However, medication adherence remains a significant barrier to achieving optimal blood pressure control. The study emphasizes that understanding the disease and its treatment is essential for improving adherence rates Gavrilova et al. (2019). The study found a direct correlation between patients' knowledge about their disease and medication therapy and their adherence levels. Patients with a better understanding of hypertension and the importance of their medication were more likely to adhere to their treatment regimens. This underscores the critical role of education in enhancing adherence among geriatric patients.

Poulter et al. (2020), Medication adherence is essential for managing hypertension effectively. Poor adherence is a significant contributor to uncontrolled blood pressure, which can lead to serious health complications, including cardiovascular diseases and increased mortality rates. The article emphasizes that despite the availability of effective antihypertensive medications, adherence rates remain suboptimal, with estimates suggesting that less than 50% of patients adhere to their prescribed regimens one year after initiation of therapy.

Lohrasbi et al. (2021) found that that health literacy is a strong predictor of medication adherence among elderly patients. Patients with higher levels of health literacy are better equipped to understand their medications, including dosage, timing, and potential side effects, which directly influences their adherence rates. Various demographic factors, such as age, education level, and socioeconomic status, significantly impact health literacy and adherence. Older adults with higher educational attainment tend to have better health literacy skills, which facilitates better understanding and management of their medications. The study also highlights the role of psychosocial factors, including support systems and mental health status. Patients who have strong social support networks are more likely to adhere to their medication regimens.

Conversely, those experiencing depression or anxiety may struggle with adherence due to cognitive overload or lack of motivation.

Adherence to recommended medication regimens is crucial for the proper management of hypertension, a condition that is common among older persons. Studies have revealed that many hypertension patients have trouble adhering to their treatment plans, which can result in major health issues. In this process, health literacy the capacity to find, comprehend, and apply health information is essential (Kilic, Dag, & MSc, 2020). According to the study, those with hypertension typically had low health literacy. Their comprehension of their illness and the significance of following prescription schedules was greatly impacted by this deficiency. Patients with lower health literacy were less likely to understand the implications of non-adherence, which can worsen their health problems, or the instructions for their medications.

Hypertension is a significant health concern within the African American community, where prevalence rates are notably higher compared to other racial groups Adinkrah et al. (2020). They found that adherence to both medication regimens and lifestyle recommendations was alarmingly low among the participants. Many individuals reported difficulties in following their prescribed treatment plans due to various barriers, including financial constraints, lack of access to healthcare resources, and insufficient understanding of their condition.

Paczkowska et al. (2021) found a significant correlation between patient knowledge about hypertension and adherence to treatment regimens. Patients who demonstrated a better understanding of their condition such as the importance of medication, potential side effects, and lifestyle changes were more likely to adhere to their prescribed treatments. Hypertension is a prevalent condition among older adults, and effective management is crucial to prevent serious health complications such as heart disease and stroke. Adherence to prescribed medications and lifestyle modifications is essential for controlling blood pressure. However, studies indicate that many patients, especially older adults, struggle with adherence due to a lack of understanding about their condition and treatment.

Theoretical Framework

Established by Ebrahimipoiur in 2016, provided a fundamental framework for comprehending the elements affecting medication adherence, especially in elderly patients. According to this theory, three main factors influence a person's desire to engage in a certain action, like following a prescription schedule: attitude toward

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the behavior, subjective norms, and perceived behavioral control. An individual's attitude indicatec how they feel about the activity in question. For example, older patients are more likely to follow their treatment programs if they think that taking their prescriptions as directed will improve their health. Support from friends, family, and medical professionals can have a big impact on a geriatric patient's desire to take their prescription as prescribed. Subjective norms are the perceived social influences that shape a person's behavior. Patients are more likely to take their prescriptions as prescribed if they believe that their family members or caretakers expect them to.

Social Cognitive Theory (SCT) posits a focus of emphasis on observable learning, imitation, and modeling within the behavior change paradigm Dela Fuente, 2023). Thus, personal variables, the environment, and behavior co-exist with each influencing the other, in turn, in some sort of reciprocal fashion. According to SCT, humans learn behaviors not just by direct experiencing but through observation of the actions taken by others with the latter's consequences upon them. In the context of a study, use of VoxQR technology is a model for effective medication management. This theory is specifically relevant to the present study because it highlights how the VoxQR intervention can enhance self-efficacy among geriatric patients by providing them immediate access to information about their medications. Increased selfefficacy leads to improved medication adherence as patients feel more confident in managing their health.

According to the Health Belief Model (HBM), health behavior is a function of how seriously a health problem is taken, how vulnerable one feels to it, the rewards for adopting preventive measures, and the obstacles to their adoption (Rentner, 2021). This model includes the following critical elements: perceived susceptibility, which means an individual's belief of the possibility of experiencing some health problem; perceived severity, which is a belief in the seriousness of the health issue consequences; perceived benefits, which are the benefits that are perceived in taking a given health action; and perceived barriers, which are the obstacles perceived in undertaking that action.

Further cues to action or external prompting stimuli and also self-efficacy which refers to the perception of a client's ability to take an action are important components in this model. This is especially relevant for the present study because this model clarifies how geriatric patients' beliefs about hypertension and its drugs can influence adherence to a prescribed regimen. For example, if older patients perceive that they are more vulnerable to the complications of hypertension and realize the seriousness of those complications, they are more likely to comply with their medication.

Conceptual Framework

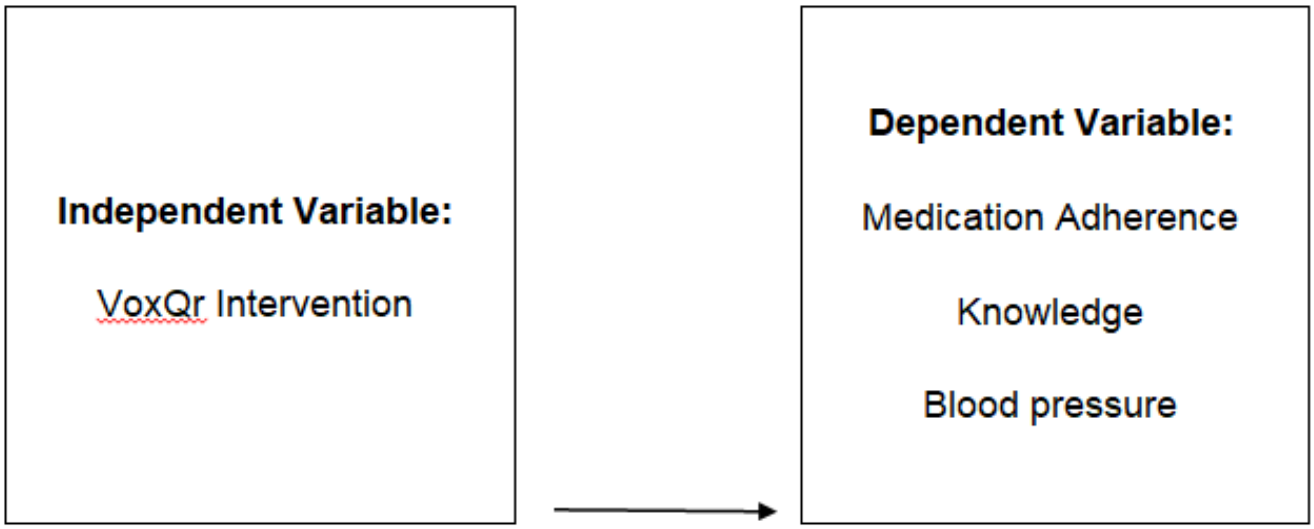

Figure 1: Conceptual Framework

The conceptual paradigm represented how the VoxQR intervention facilitates the enhancement of medication adherence for geriatric hypertensive patients. It used voice-assisted technology to help enhance the patient's understanding and control over their medication regimen, which is quite helpful for elderly patients due to the

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complexity of using text-based instructions. In this study, the attention was given to implementing VoxQR in the clear provision of accessible information on medication through voice commands. This innovative approach addressed the most common barriers to adherence, such as health literacy challenges and cognitive decline. The most important outcome variable to be affected is medication adherence, which is expected to be enhanced due to VoxQR intervention; improved medication adherence is very important to control hypertension and reduce its complications, such as cardiac events. Improved knowledge in terms of hypertension and its management among the patients is the other expected outcome of this intervention since the information offered will be patient-specific to enhance the patient's comprehension about his or her medicines and, consequently, boost self-management skills.

Statement of the Problem

This study investigated the Effectiveness of VoxQR (Voice- powered QR codes) in Enhancing Knowledge Medication Adherence for

Geriatric Hypertensive Patients in Koronadal City.

This study specifically sought to answer the following questions:

1. What is the level of the following clinical indicators of geriatric hypertensive patients before and after the Medication Adherence VoxQR code intervention in terms of:

1.1. Medication Adherence

1.2 knowledge

2. Is there a significant difference in the level of the following clinical indicators of geriatric hypertensive patients before and after the Medication Adherence VoxQR code intervention in terms of:

2.1 Medication Adherence

2.2 knowledge

Hypothesis

Hypothesis 1: Medication Adherence

• Null Hypothesis (H0): There was no significant difference in medication adherence levels among geriatric hypertensive patients before and after the implementation of the VoxQR code intervention.

Hypothesis 2: Knowledge

• Null Hypothesis (H0): There was no significant difference in knowledge regarding hypertension and medication management among geriatric hypertensive patients before and after the VoxQR code intervention.

• Alternative Hypothesis (H1): There was a significant difference in knowledge regarding hypertension and medication management among geriatric hypertensive patients before and after the VoxQR code intervention.

Significance of the Study

The following will benefit from this study:

Healthcare Policy: Findings from this research could enhance knowledge of healthcare policymakers about the importance of integrating technology into patient care strategies, particularly for vulnerable populations such as the elderly.

Patient Education: This research may also underscore the importance of patient education in medication adherence.

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Healthcare Outcomes: Ultimately, the findings could contribute to a broader understanding of how technology-driven interventions can lead to improved health outcomes, reduced healthcare costs, and enhanced quality of life for elderly patients managing chronic conditions like hypertension.

Researcher: The study is significant because it contributes to expanding their understanding of the topic. By conducting the study, the researcher engages with the latest theories, concepts, and methodologies, enhancing their expertise in the field.

Future Researchers: The study's results could serve as a foundation for future research exploring the use of technology in enhancing medication adherence across different populations and health conditions.

Scope and Delimitations

The purpose of this study was to assess how well VoxQR (voice powered QR codes) improve medication adherence in elderly hypertension patients in Koronadal City. Important clinical variables were evaluated in the study, such as blood pressure readings before and after the VoxQR code intervention is put into place, medication adherence rates, and patient understanding about their prescriptions. Elderly individuals 60 years of age and older who have been diagnosed with hypertension and were now taking antihypertensive drugs will make up the target population. The study was carried out at Koronadal City community pharmacies, where participants were instructed on the proper use of the VoxQR code system.

Limitation of the Study

The results and generalizability of this study have been affected by several limitations. First, the sample size might be constrained by the number of participants available in Koronadal City's community pharmacies, which could affect the findings' statistical power. Furthermore, because individuals may exaggerate their adherence or comprehension because of social desirability, self-reported assessments of drug adherence and knowledge may introduce bias. Additionally, the length of the trial might not be enough to record the VoxQR code intervention's long-term benefits on clinical outcomes and medication adherence. Finally, participants' adherence behaviors may be influenced by outside variables such modifications to healthcare regulations or availability of medical care throughout the study period.

Younger populations and patients with other chronic diseases were excluded in this study because it only focused on elderly hypertension patients being treated at Koronadal City community pharmacy. Only VoxQR code technology was used in this experiment; no other digital health tools or interventions that might improve medication adherence were included.

Furthermore, long-term follow-up assessments were not incorporated into the study, this study evaluated short-term outcomes pertaining to medication adherence and understanding. The research sought to maintain a focused approach that enables a comprehensive assessment of the efficacy of the VoxQR code intervention within a particular setting by precisely specifying these delimitations.

Definition of Terms

For further understanding, the following terms are operationally and conceptually defined:

Medication adherence. It refers to a critical component in the management of chronic diseases, particularly hypertension, where consistent medication intake is essential for achieving optimal health outcomes and preventing complications.

Knowledge: It refers to the understanding that geriatric hypertensive patients have regarding their medications, including information about drug indications, dosages, side effects, and the importance of adherence. This knowledge were assessed using a standardized questionnaire before and after the intervention.

VoxQR: It refers to a proposed mobile application by the researcher designed to help prevent medication errors among geriatric hypertensive patients. It utilized voice-powered QR codes to provide medication reminders, dosage instructions, and educational content related to hypertension management.

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METHODOLOGY

This chapter presented the research method, the respondents of the study, sampling technique, the research instrument, scaling and quantification of data, data gathering procedure and statistical treatment of data.

Research Design

The usefulness of VoxQR (voice-powered QR codes) in improving medication adherence and knowledge among elderly hypertension patients in Koronadal City was investigated in this study using a quasi-experimental research method. The goal of a quasi-experimental study design was to assess the impact of an intervention without randomly allocating participants to treatment or control groups. Unlike actual experimental designs, it frequently uses pre-existing groups or allows for a certain amount of non-random assignment. When randomization was impractical or unethical, quasi-experimental methods are helpful because they enable researchers to make causal inferences while considering potential confounding variables (Cook & Campbell, 2021).

Research Locale

The study was carried out in the South Cotabato province, specifically in the municipality of Koronadal, which has 27 barangays split between rural and urban areas. Its GPS coordinates are 6°29'47.0" N and 124°50'35.1". The most southern city in the Philippines is Koronadal City, which serves as the provincial capital of Mindanao's southern portion and has the postal code 9506. There are 195,398 people living in Koronadal City as of the 2020 census, which makes up 20.03% of the province of South Cotabato's total population.

Figure 2: Map of the Philippines and Koronadal City, South Cotabato Research Participants

The participants of this study were individuals who aged 60 and older and have been diagnosed with hypertension. These individuals were chosen through purposive sampling, ensuring they meet specific inclusion criteria such as age, diagnosed with hypertension, willingness to participate, ability to use VoxQR technology and no severe cognitive impairment.

In this research, purposive sampling was applied as the sampling method that will select participants who most likely provide valuable insight into the effectiveness of VoxQR in enhancing medication adherence and knowledge in geriatric hypertensive patients. Purposive sampling, more commonly referred to as judgmental or selective sampling was a non-probability in which participants were chosen based on the purposes of the study Jim (2020). Using this approach, the researcher allowed the selection of information-rich cases that will provide an in depth understanding and nuanced perspective of the phenomenon that is under study.

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Research Instrument

A three -part self-made validated questionnaire were used in the investigation. The part l included 10 items designed to assess participants' medication adherence. The part ll comprised 10 itens that evaluated their knowledge related to hypertension. This portion assessed participants' knowledge of their drugs, adherence practices, and any perceived obstacles to adhering to their prescribed regimens. All items were structured to gather comprehensive information relevant to the study.

It was consisted of Likert scale items. A thorough evaluation of both quantitative data and qualitative insights into the participants' experiences with medication adherence was made possible by the mix of inquiry types.

To guarantee the validity and reliability of this questionnaire, it was developed using accepted principles of instrument design. Every item was thoughtfully designed to complement the goals of the study, guaranteeing that it measures the relevant constructs. To further improve the effectiveness of the instrument, a pilot test was carried out with a small group of elderly patients to clarify and improve the questions.

A letter request for content validation of Part I and Part II of the research questionnaire was sent to the three (3) Registered Pharmacist for three years in their current position. The suggestions from these validators were considered in the revision and finalization of the questionnaire before the final copy was reproduced.

Data Gathering Procedure

An official letter requesting permission to conduct the study were written and sent to the Mayor of Koronadal City prior to data collection, as approved by the Department Dean. The chosen participants in the study were interviewed in-person by the researcher.

With the use of this approach, which facilitates direct communication, the researcher was able to collect detailed information about how well VoxQR (Voice QR codes) improve medication adherence and knowledge in elderly hypertensive patients. To complete the survey, the participants were given 30 minutes by the researcher. After giving the NUPs enough time to finish the questionnaire in a halfhour, the respondents' questionnaires were gathered. Then, the gathered information was tallied, tabulated, and statistically analyzed as needed. In order to promote truthful and objective responses, the data collection procedure guaranteed the respondents' confidentiality and anonymity. Throughout the data gathering process, researcher adhered to stringent ethical guidelines, protecting the participants' rights and privacy.

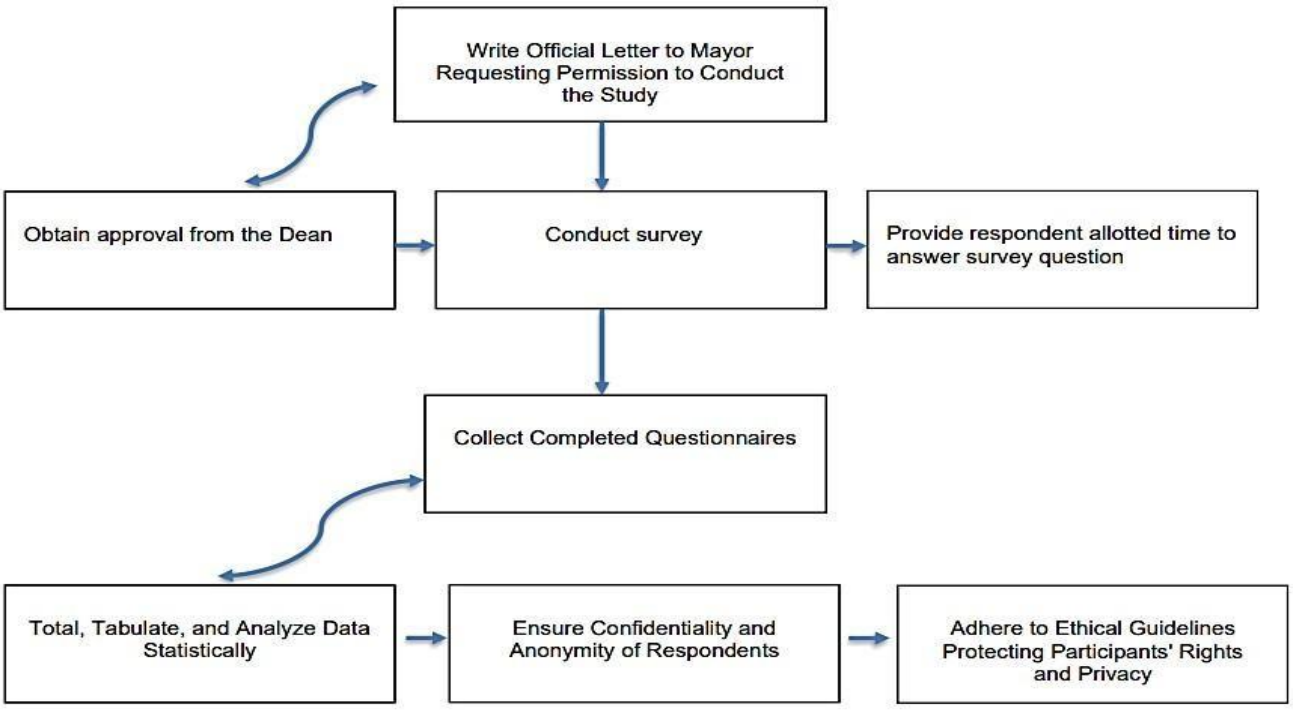

Figure 3: Data Gathering Procedure.

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Scoring and Quantification

To describe the extent of various dimensions within the study, the researcher used a 4-point Likert Scale. This scale was particularly effective for measuring attitudes, perceptions, and behaviors related to medication adherence among geriatric hypertensive patients. The 4-point Likert scale provided four distinct response options: 1 - Strongly Disagree, 2 - Disagree, 3 - Agree, and 4 Strongly Agree. This format obliged respondents to express an opinion without the option of a neutral response which helped eliminate indecisiveness and encourage more definitive answers.

The use of a 4-point scale was advantageous in this research context because it compels participants to lean towards either agreement or disagreement, thereby providing clearer insights into their attitudes toward medication adherence and the effectiveness of the VoxQR intervention. For example, questions may assess how confident participants feel about their understanding of their medications or how they perceive the usefulness of the VoxQR technology in managing their health.

Statistical Treatment

To address the study concerns, the collected data was totaled and examined. The means of the responses were calculated, and only the most significant were highlighted in the finding's presentation. To analyze the average responses, the study used a 4-point rating scale to ascertain participants' degree of agreement or perception with respect to several facets of medication adherence and knowledge improvement via the VoxQR code intervention. A more detailed assessment of participants' attitudes was made possible by the scale, which goes from 1 (strongly disagree) to 4 (strongly agree).

Descriptive statistics were used to examine the information gathered from the Likert scale replies. This involved figuring out the average score for every item, which gives a general indication of how participants felt about their understanding and adherence to their prescription both before and after using VoxQR. Furthermore, frequency distributions were produced to show the proportion of respondents who choose each category on the scale, which aids in spotting patterns in the sample population's opinions or habits.

It is essential to consider suitable statistical treatments because Likert scale data are frequently handled as ordinal. When analyzing ordinal data, some researchers recommend using non-parametric tests like the Mann-Whitney U test or Spearman's rank correlation coefficient. However, other researchers contend that parametric tests like t-tests or ANOVA can also be used if the sample size is large enough and the distribution is normal. If circumstances allow, parametric techniques may be applied in this study to evaluate mean score differences between pre- and post-intervention groups.

Ethical Considerations

During the conduction of this study on the efficacy of VoxQR voice powered

QR codes in improving adherence to medication and knowledge in elderly hypertensive patients, several ethical considerations were fundamental to ensuring research integrity and protecting participants. The researchers ensure that all possible issues are considered and appropriately addressed. Equally important is the acquisition of informed consent from all participants who are part of the study. The main ethical consideration is heightened by the need for anonymity and confidentiality. All participating elderly hypertensive patients are given an informed consent form, which allows them to check and understand the study before deciding to participate.

The information collected by VoxQR Code is sensitive and confidential, and it must be protected in accordance with the Data Privacy Act. The Data Privacy Act requires organizations to implement technical, physical, and administrative measures to ensure the confidentiality and safekeeping of data.

In addition, VoxQR Code also complied with specific requirements of the Data Privacy Act. For example, researchers obtained consent from patients before collecting and processing their personal data. Researchers must also provide patients with access to their personal data and allow them to request corrections or deletions of their data.

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VoxQR Code must also have policies and procedures in place to manage data breaches. Researchers document any incidents of unauthorized access to or disclosure of personal data and report them to the relevant authorities and affected individuals within a specified timeframe.

After compiling and obtaining all the data required for this study, the researchers destroy all data collection documents, including the information sheet, the consent forms from the respondents, and the questionnaire containing all their responses, to safeguard the privacy of the respondents. This guarantees that the responders' safety and privacy are appropriately handled and managed. The utmost importance is placed on research participants' dignity.

RESULTS AND DISCUSSIONS

This chapter introduced, examined, and explained the information collected in response to the research objectives. The findings were organized systematically for the purpose of providing a transparent perspective of the findings and their implications for the research.

1. Level of the following clinical indicators of geriatric hypertensive patients before and after the Medication Adherence VoxQR code Intervention.

Table 1: Medication Adherence Before Utilizing VoxQR

QUESTIONS	Mean	Verbal Interpretation
1. I take my hypertension medication exactly as prescribed by my doctor.	2.24	Moderate-Low Level
2. I never forgot to take my medication.	2.48	Moderate-Low Level
3. I intentionally skipped a dose because I felt fine.	2.63	Moderate-High Level
4. I never experience difficulty remembering when to take my hypertensive medication.	2.67	Moderate-High Level
5. I don't have trouble understanding my hypertensive medication instructions.	2.43	Moderate-Low Level
Overall Mean	**2.49**	**Moderate-Low Level**

Table 2: Medication Adherence After Utilizing Voxqr

QUESTIONS	Mean	Verbal Interpretation
1. Now, I take my hypertension medication exactly as prescribed by my doctor.	3.31	High Level
2. I feel more confident in taking my hypertensive medications correctly.	3.17	Moderate-High Level
3. I no longer skip doses because of the VoxQR reminders.	2.96	Moderate-High Level
4. VoxQR reminds me when to take my hypertensive medication.	3.26	High Level
5. I feel more confident in taking my hypertensive medications correctly.	3.01	Moderate-High Level
Overall Mean	**3.14**	**Moderate-High Level**

Before

Medication Adherence

Table 1 shown the level of clinical indicators related to medication adherence among geriatric hypertensive patients in in Koronadal City before the Medication Adherence VoxQR code intervention was introduced.

The strongest statement to have the highest mean was Statement 4: " I never experience difficulty remembering when to take my hypertensive medication," with a mean of 2.67, a Moderate-High Level of adherence. This result indicates that most of the geriatric patients with hypertension in Koronadal City already had some memory for remembering their medication regimen prior to the VoxQR code lntervention. Such memory retention might

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be due to daily habits or time routine reminders, such as taking medicine with food or in the morning. Moreover, caregivers or family members could be having an active part in reminding the patients to use their medication, thus supporting compliance.

Conversely, the lowest mean occurred for Statement 1: " I take my hypertension medication exactly as prescribed by my doctor," which had a mean score of 2.24, and it fell under the Moderate-Low Level of compliance. This result points to an even more troubling fact: even if patients do recall taking their medicine, many are not adhering to the intended regimen in dosing, timing, or frequency. This misalignment can lead to decreased efficacy of treatment and greater health consequences. Possible explanations for this outcome are low health literacy, reading confusion of prescription labels, and unawareness of the consequences of non-compliance. In addition to that, old age cognitive impairment, visual disturbances, or even the complexity of medication directions might also impede strict compliance. Unknowingly, patients may miss doses, double doses, or administer medicine at the incorrect times, all of which break the efficacy of therapy.

Overall mean for all clinical indicators was 2.49, reflecting a Moderate-Low Level of medication adherence prior to VoxQR code intervention implementation. This suggests that geriatric patients are trying, but to some extent only, to control their hypertension by taking their medications. It implies that patients' adherence to medications is suboptimal and not consistent. It appears that current methods, either in the form of informal routine or caregivers, are inadequate to provide regular, correct, and timely consumption of medications.

This trend in the outcomes can be attributed to a variety of reasons. Most patients who are elderly suffer from age-related issues like forgetfulness, poor vision, and lower understanding of medical procedures. Although they can remember that they need to take medicine, specifics like timing, dosage, and frequency tend to be issues without adequate help tools or reminders.

This was echoed by Marengo and Barberato-Filho (2023), who highlighted the importance of medication adherence devices being designed through contributions from older individuals. Their scoping review reported that older patients are eager to accept the use of assistive devices to mitigate physical and cognitive limitations, such as audio or haptic feedback devices a central tenet in the VoxQR code intervention.

Likewise, Faisal et al. (2023) emphasized the significance of smart features in medication management devices, like voice guiding and easy-to-use interface design, that facilitate easier prescription-compliance among elderly individuals. The application of VoxQR code is consistent with such evidence by providing an audiobased reminder mechanism specially designed to overcome memory and literacy limitations.

Last of all, Jachimowicz et al. (2021) provided behavioral evidence concerning medication-taking behavior. Based on their study, emphasizing the subject-specific health implications of non-compliance and incorporating behavioral cues in other words, straightforward reminders and stable feedback can significantly enhance compliance. That is also an argument for making use of innovative and customized instruments like VoxQR code in encouraging compliance among older adult hypertensive patients.

After

Medication Adherence

Table 2 shown the level of medication adherence of among geriatric hypertensive patients in Koronadal City's after the use of the Medication Adherence (VoxQR). The table quantifies the effect of the intervention on the behavior of patients through different indicators of their medication regimen.

Highest mean score was achieved by Statement 1: "Now, I take my hypertension medication exactly as prescribed by my doctor," with a mean score of 3.31 and was rated as having a High Level of medication adherence. It indicates that with the introduction of VoxQR code, a very high proportion of elderly hypertensive patients in Koronadal City started to adhere more accurately and regularly to their prescribed drug regimens. This substantial improvement suggests that VoxQR code was a successful behavioral cue that facilitated the habit of taking medication. It’s easy and consistent visual and routine-based monitoring likely facilitated overcoming typical barriers like forgetfulness or insufficient perceived urgency in medication regimens.

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On the other hand, the lowest mean score was achieved in Statement 3: "I no longer skip doses because of the VoxQR reminders," with a mean of 2.96, still at a Moderate-High Level of adherence. Although this finding reflected overall improvement, it also shows that total eradication of skipped doses was not universally achieved. This residual difficulty can be attributed to a variety of possible reasons. First, age-related cognitive impairment, for example, memory loss or attention deficit, can still disrupt rigid compliance regardless of reminders. Second, some other patients might not have integrated the VoxQR fully into their daily routines, possibly due to unfamiliarity with the technique, physical disability (e.g., poor sight or dexterity), or limited engagement. Third, extrinsic environmental or social factors such as unstable caregiver support, intricate medication regimens, or even psychiatric resistance to the use of chronic medications may further account for why some doses continued to be omitted even after the intervention.

The overall mean score across all measures in Table 2 was 3.14, which is a Moderate-High Level of adherence after the administration of the VoxQR. This outcome suggests that the VoxQR intervention was generally effective in improving medication adherence among elderly hypertensive patients. It offered a structured, visible, and behaviorally engaging system that probably encouraged regular medication intake. The improvement observed can also be attributed to the psychological advantage of self-monitoring, wherein patients tend to adhere to their routines when they can visibly measure their progress.

The high degree of improvement in compliance can be explained by the visual and behavioral encouragement from the VoxQR tracker. In older patients with poor memory or motivation, a visual reminder every day and habit tracking device made taking medication a habitual activity less likely to be forgotten. In addition, repeated use of VoxQR may have created a sense of responsibility or achievement to comply with prescriptions.

The findings corroborate Simon et al. (2021), who wrote that safe, easy solutions such as digital tools, reminders, and structured care systems significantly improve drug compliance, especially among patients with cardiovascular disease. The study indicates that medication adherence is not just a medical issue but a behavioral one—addressed effectively by interventions such as VoxQR.

Likewise, McGillicuddy et al. (2020) found that mHealth interventions—i.e., mobile-based reminders and monitoring devices—were associated with heightened stability and consistency of drug levels among patients. Their research supports that technology-enabled strategies such as VoxQR minimize variability in adherence behavior, a finding supported by the increased precision achieved in Statement 1 of the current study.

Within a systematic review conducted by Bingham et al. (2021), telehealth interventions resulted in medication adherence to chronic conditions such as hypertension. While evidence of the efficacy of reminder-based strategies is supported in the review, there are noted limitations especially in low tech-literate or variable device use populations. This perhaps explained why some of the sample in the current study continued to report occasional dose skipping, despite the intervention period.

Knowledge

Table 3: Knowledge Before Utilizing VoxQR

QUESTIONS	**Mean**	**Verbal Interpretation**
1. I know that the normal blood pressure for adults is around 120/80 mmHg.	2.97	Moderate-High Level
2. I know that the main purpose of antihypertensive medication is to lower and maintain healthy blood pressure.	3.07	Moderate-High Level
3. I know the specific time of day I am supposed to take my blood pressure medication.	2.48	Moderate-low Level
4. I know the correct dosage of my antihypertensive medication.	2.83	Moderate-High Level
5. I am aware that missing doses of my antihypertensive medication can lead to health complications.	2.57	Moderate-High Level
Overall Mean	**2.78**	**Moderate-High Level**

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Table 4: Knowledge After Utilizing VoxQR

QUESTIONS	Mean	Verbal Interpretation
1. I know that the normal blood pressure for adults is around 120/80 mmHg.	3.27	High Level
2. I know that the main purpose of antihypertensive medication is to lower and maintain healthy blood pressure.	3.34	High Level
3. Using VoxQR, I am aware of the specific time of day I need to take my blood pressure medication	3.13	Moderate-High Level
4. The app teaches me the correct dosage of my antihypertensive medication.	3.23	Moderate-High Level
5. Because of VoxQR, I am aware that missing doses of my antihypertensive medication can lead to health complications.	3.45	High Level
Overall Mean	**3.28**	High Level

Table 3 shown the knowledge level of Koronadal City geriatric hypertensive patients on their clinical indicators before the Medication Adherence (VoxQR) intervention was implemented. The table contained statements that measure patients' knowledge on the purpose, timing, and routine of their antihypertensive medication regimen.

The statement that received the highest mean was: Statement 2: "I know that the main purpose of antihypertensive medication is to lower and maintain healthy blood pressure," having a mean of 3.07, equating to a Moderate-High Level of knowledge. This indicated that most elderly patients have a basic knowledge of why they are given antihypertensive medication. Knowledge of the function of medication is a key initial step toward the formulation of a good attitude towards compliance, since patients are more apt to cooperate when they are aware of the health advantages that accrue from accurate drug use.

Statement 3: "I know the specific time of day I am supposed to take my blood pressure medication," had the lowest mean of 2.48 and was interpreted as a

Moderate-Low Level of knowledge. This is a difference between theoretical and practical knowledge patients may be aware of the necessity of the medication but may not necessarily know the specific timing that is optimal. This medication timing error can result in missed doses or erratic blood pressure control, compromising the efficacy of treatment and putting patients at increased risk of complications.

Overall, the aggregate mean score was 2.78, which was below the Moderate-High Level of knowledge. This suggested that, pre-VoxQR code intervention, geriatric hypertensive patients had sound rudimentary knowledge of their condition and drug. Inconsistency in range of individual indicators, however, suggests diversity of knowing patients know the overall intent of their medication but perhaps not implementation details like timing and regimen composition.

The findings were consistent with the general pattern among older patients, wherein overall familiarity can be found, but specific knowledge about procedures may not be present. This might be due to verbal-only instruction during consultations, declining cognitive functions, or lack of written reminders. Patients might also forget exact instructions without available and tailored support tools, even if they appreciate the drug's contribution in blood pressure control.

These results were complemented by DeFulio and Silverman (2012), which highlighted the reinforcement and organized support systems role in enhancing medication adherence. They discovered that patients know why they are on drugs but tend to not consistently deliver detailed adherence without being prompted or supported by an organized tool or protocol. That is what equates to this current study's moderate-high purpose knowledge but moderate-low timing knowledge.

Similarly, Stern et al. (2016) proposed the use of personalized medication discharge kits to help patients manage complex medication regimens. According to their research, even with successful discharge education, patients do not necessarily store or adhere to timing instructions unless supported by visual or physical means highlighting the importance of tools such as VoxQR to bridge that knowledge gap in specific areas.

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After

knowledge

Table 4 presented the level of knowledge regarding hypertension medication adherence among geriatric patients after the implementation of the VoxQR code Medication Adherence. The table presents participants' responses to several statements that indicate their recognition and understanding of proper use of medication, timing, and nonadherence effects.

The highest mean score was obtained in Statement 5: "Thanks to VoxQR, I am aware that missing doses of my antihypertensive medication can lead to health complications," with a mean of 3.45, which was interpreted as a High Level of knowledge. This means that the VoxQR code intervention successfully improved geriatric hypertensive patients' awareness of the possible outcomes of nonadherence, i.e., the health complications resulting from skipped doses of ordered medication. This finding supports the educational importance of the VoxQR that was not only employed as a behavioral aid to track but also to remind patients of important health about regular medication intake.

The lowest mean score was in Statement 3: "Using VoxQR, I am aware of the specific time of day I need to take my blood pressure medication," with a mean of 3.13, which is still a Moderate-High Level of knowledge. Although this is a generally positive effect, it also suggests that there are still some lingering gaps in time-related medication knowledge. This may be due to any number of factors: the VoxQR might not have emphasized time-of-day reminders as much as other adherence reminders, or some patients may simply continue to struggle with incorporating fixed drug regimens into their schedule.

The overall mean score for knowledge post-implementation of the VoxQR was 3.28, which is interpreted as a High Level of knowledge. This indicated that the intervention significantly improved patients' knowledge about their medication and the implications of nonadherence. In addition to encouraging action, the VoxQR seems to have supported cognitive engagement, empowering patients with actionable knowledge.

The significant overall high scores for the majority of statements suggested that VoxQR was able to convey educational messages and reiterate patients' knowledge of medication adherence successfully. Small challenges with time-specific memory or scheduling, however, can have contributed to the lower score on Statement 3 which can be attributed to age-related challenges with memory or insufficient attention to timing in the intervention.

These findings were consistent with Marengo and Barberato-Filho (2023), who found that digital interventions involving visual reminders and interactive features significantly improved elderly patients' knowledge and awareness of medication. Their research highlighted the role of organized interventions in enhancing medication consequence knowledge, especially among hypertensive patients.

Likewise, Faisal et al. (2023) indicated that mobile and QR code-based reminder and education systems enhanced general and specific knowledge regarding the use of medications. They found that when elderly patients are given easy-to-read electronic reminders, their capacity to understand dosing regimens and risks of nonadherence significantly enhances.

In addition, Jachimowicz et al. (2021) offered proof supporting the concept that behaviorally-informed interventions like VoxQR not only enhance behaviors but also boost cognitive awareness of health habits. In their research, nudging through customized, low-effort prompts yielded improved long-term retention of knowledge and healthy behavior, particularly among populations with original low levels of compliance.

2. Significant difference in the level of the following clinical indicators of geriatric hypertensive patients before and after the Medication Adherence VoxQr: Table 7 provided statistical comparison of three significant clinical measures medication adherence, knowledge, and blood pressure monitoring—prior to and subsequent to use of the VoxQR code Medication Adherence by geriatric hypertensive patients. Results provided mean scores, standard deviations, tvalues, degrees of freedom (df), and p-values for each measure. Statistical significance was established using a p-value of < 0.05.

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For adherence to medication, the mean score was substantially higher at 3.14 (SD = 0.1529) post-intervention than 2.49 (SD = 0.1719) before the intervention, t-value of 5.4251 and p-value 0.0056, indicating statistically significant improvement. This outcome favors the efficacy of VoxQR in improving the regularity, timing, and compliance in general with antihypertensive medication among elderly patients. The improvement is a sign of a positive behavioral change, as the participants began complying more in accordance with their prescribed regimens. This could be an effect of the visual and auditory reminders of VoxQR code, which introduced a structured reminder system that patients could daily count on. This reinforcement is particularly important in older individuals, who are vulnerable to age-related cognitive impairment, polypharmacy, and reduced caregiver monitoring. VoxQR code most likely served not just as a passive device, but as an active behavior intervention, simplifying medication regimens and reducing incidents of forgetfulness or indiscriminate omission. The result emphatically attests to the value of low-tech yet habit-reforming devices in enhancing health outcomes among high-functioning vulnerable populations.

In regards to knowledge, the same statistically significant increase was noted, with mean scores increasing from 2.78 (SD = 0.2533) pre-intervention to 3.28 (SD = 0.1199) post-intervention, with a t-value of 4.3049 and a p-value of 0.0126. What this indicates is that not only did the VoxQR code intervention alter patient behavior, but it improved the patients' knowledge regarding the necessity and proper use of antihypertensive medications. The tracker can have served as an educational contact point—providing repeated exposure to information about medication timing, dose, and consequences of nonadherence. For older patients, who frequently struggle with health literacy or memory recall, this kind of embedded, repeated learning is both feasible and effective. As they interacted with the VoxQR code in the course of their daily activities, patients were presumably reminded not only when to take their medication but also why taking it is important, creating an enhanced cognitive linkage to their care.

In terms of blood pressure tracking, the outcome once more was a statistically significant improvement, as the mean went up from 2.47 (SD = 0.0952) prior to intervention to 3.05 (SD = 0.2344) thereafter, backed by a t-value of 5.1269 and a p-value of 0.0009. This means that patients became more engaged and proactive in learning and monitoring their blood pressure after the VoxQR code usage. Although the app itself did not measure blood pressure, frequent reminders to take medication may have boosted patients' activity with self-monitoring behaviors. Improved compliance generally accompanies increased frequency of visits, home blood pressure monitoring, and communication with clinicians. The result shown that once the patients understood the importance of being compliant with their drug regimen, they also became more vigilant in observing the effects— particularly the management of blood pressure. The dramatic improvement in this domain is an indication of transition from passive receipt of care to active engagement in disease control, a significant target in geriatric health policies.

Generally, the findings showed that there was a statistically significant change in all the clinical parameters monitored among geriatric hypertensive patients following the use of the Medication Adherence VoxQR code. Medication compliance rose from a mean of 2.49 pre-intervention to 3.14 post-intervention ($p = 0.0056$), which is a change from a Moderate-Low to a Moderate-High Level of compliance. Scores for knowledge rose from a mean of 2.78 to 3.28 ($p = 0.0126$), which represents a change from a Moderate-High to a High Level of knowledge about hypertension and medication. Finally, indicators of blood pressure increased from a mean of 2.47 to 3.05 ($p = 0.0009$), which represents a significant shift from a Moderate-Low to a Moderate-High Level in patients' confidence and knowledge about their blood pressure control. These findings validate that the VoxQR code intervention was successful in improving behavioral compliance, health literacy, and patient activation in hypertension self-care.

The findings indicated that the VoxQR intervention is a valuable intervention for improving medication compliance, health knowledge, and blood pressure awareness in geriatric patients with hypertension. It is simple, behaviorally supported design addresses both cognitive and routine-related problems in elderly care and is therefore an effective measure for enhancing self-management among this population.

Such findings are excellently supplemented by Poulter et al. (2020), who emphasized the need for compliance to medication on a daily basis in order to achieve best control of blood pressure. Their study emphasized the fact that without compliance, even the best antihypertensive medication cannot deliver results. VoxQR directly supports this principle by inducing adherence through ease of use and accessibility.

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Similarly, Siddiqui et al. (2020) found that the majority of patients diagnosed with resistant hypertension were in fact suffering from nonadherence. Such research supports the efficacy of tools like VoxQR code in eliminating treatment resistance assumptions and giving patients the power to stick to their treatment schedule consistently. The dramatic elevation in the level of adherence in the present study supports this necessity for behaviorally focused adherence tools.

In addition, the enhancements of patient knowledge and activation were complementary to results by Sartori et al. (2020), who illustrated that digital and messaging-based health education interventions (e.g., WhatsApp) enhanced medication adherence and knowledge in hypertensive and diabetic patients. VoxQR, though not digital, produces a comparable effect through salient and frequent exposure to health messaging and medication adherence reminders.

Table 5 Significant Difference before and after

Clinical Indicators		Mean	SD	*T-Value*	*df*	p-value	Interpretation
Medication Adherence	Before	2.49	0.1719				
	After	3.14	0.1529	5.4251	4	p= 0.0056	Significant
Knowledge	Before	2.78	0.2533				
	After	3.28	0.1199	4.3049	4	p=0.0126	Significant
Blood Pressure	Before	2.47	0.0952				
	After	3.05	0.2344	5.1269	8	p=0.0009	Significant

p is significant at <0.05.

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CONCLUSION

Based on the findings of the study, the researcher concluded the following:

1. Before the Medication Adherence VoxQR code was introduced, geriatric hypertensive individuals in Koronadal City presented with inconsistent drug adherence and discrepancies in practical knowledge, particularly timing of medication intake, which negatively impacted blood pressure control. The patients were conscious of the danger of hypertension but were not sure about selfassessment. Following the VoxQR code intervention, adherence, knowledge, and confidence in the control of blood pressure significantly enhanced, with some issues in complete uptake of the tool and coping with complicated regimens persisting and an implication that support is still needed to reinforce self-care.

2. Statistical analysis attested to the notable improvement in medication adherence, knowledge, and blood pressure measurement in geriatric hypertensive patients after employing the Medication Adherence VoxQR code. These findings support that the intervention was successful in improving behavioral compliance, health literacy, and self-management and justifying its merit as a pragmatic tool in improving hypertension management among the elderly.

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RECOMMENDATIONS

Based on the findings and conclusions, the study arrived at the following recommendations:

1. The continued use of the Medication Adherence VoxQR code may encouraged for enhancing medication compliance and self-tracking among elderly patients with hypertension. Moreover, extended support could be offered to guide patients in dealing with difficulties associated with the application of the instrument and adherence to complicated regimens.

2. The Medication Adherence VoxQR code may be suggested to be used in geriatric hypertensive patients since it can immensely enhance medication adherence, understanding, and blood pressure assessment, thus overall selfmanagement and health outcomes.

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REFERENCES

1. Abalos, J. B., Saito, Y., Ramos Jr, M. A., & Cruz, G. T. (2024). Prevalence, awareness, treatment, and control of hypertension among older adults in the Philippines. The Journals of Gerontology: Series A, 79(2), glad155. https://doi.org/10.1093/gerona/glad155.
2. Abunales, J. L., Ordoñez, J. R. V., Salandanan, S. B. B., & Ayran, C. M. G. (2024). Evaluation of medication errors among inpatients in a tertiary government hospital's pulmonary medicine service: A cross-sectional retrospective study. Acta MedicaPhilippina.https://search.bvsalud.org/gim/?lang=en&q=mh%3A%22Antihypertensive+Agents%22.
3. Adinkrah, E., Bazargan, M., Wisseh, C., & Assari, S. (2020). Adherence to hypertension medications and lifestyle recommendations among underserved African American middle-aged and older adults. International Journal of Environmental Research and Public Health, 17(18), 6538. https://doi.org/10.3390/ijerph17186538.
4. Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall.
5. Bingham, J. M., Black, M., Anderson, E. J., Li, Y., Toselli, N., Fox, S., ... & SilvaAlmodóvar, A. (2021). Impact of telehealth interventions on medication adherence for patients with type 2 diabetes, hypertension, and/or dyslipidemia: A systematic review. Annals of Pharmacotherapy, 55(5), 637-649. https://doi.org/10.1177/1060028021993123.
6. Capranzano, P., Francaviglia, B., Sardone, A., Agnello, F., Valenti, N., Frazzetto, M., & Tamburino, C. (2021). Suitability for elderly with heart disease of a QR code-based feedback of drug intake: Overcoming limitations of current medication adherence telemonitoring systems. International Journal of Cardiology, 327, 209-216. https://doi.org/10.1016/j.ijcard.2020.11.057.
7. Choudhry, N. K., Kronish, I. M., Vongpatanasin, W., Ferdinand, K. C., Pavlik, V. N., Egan, B. M., ... & American Heart Association Council on Hypertension; Council on Cardiovascular and Stroke Nursing; and Council on Clinical Cardiology. (2022).

8. Medication adherence and blood pressure control: A scientific statement from the American Heart Association. Hypertension, 79(1), e1-e14. https://doi.org/10.1161/HYP.0000000000000196.
9. DeFulio, A., & Silverman, K. (2012). The use of incentives to reinforce medication adherence. Preventive Medicine, 55, S86-S94. https://doi.org/10.1016/j.ypmed.2012.07.004.
10. Devi, R. L., Sangeetha, K., Ragav, A., Ashwin, R., & Ponshanmugakumar, A. (2023, December). QR Code-Enhanced Drug Identification and Access (pp. 1-6). IEEE. https://doi.org/10.1109/ICCEBS56123.2023.10123456.
11. Faisal, S., Samoth, D., Aslam, Y., Patel, H., Park, S., Baby, B., & Patel, T. (2023). Key features of smart medication adherence products: Updated scoping review. JMIR Aging, 6, e50990. https://doi.org/10.2196/50990.
12. Gavrilova, A., Bandere, D., Rutkovska, I., Šmits, D., Mauriņa, B., Poplavska, E., & Urtāne, I. (2019). Knowledge about disease, medication therapy, and related medication adherence levels among patients with hypertension. Medicina, 55(11), 715. https://doi.org/10.3390/medicina55110715.
13. Giron, M. S. T., & Cortes-Maramba, N. P. (2020). Appropriateness of medication prescribing in hospitalized older adults in a tertiary teaching hospital in the Philippines: A cross-sectional study. Drugs-Real World Outcomes, 7, 213-219. https://doi.org/10.1007/s40801-020-00216-0.
14. Gutierrez, M. M., & Sakulbumrungsil, R. (2021). Factors associated with medication adherence of hypertensive patients in the Philippines: A systematic review. Clinical Hypertension, 27, 1-15. https://doi.org/10.1186/s40885-021-00243-3.
15. Hu, J., Ren, J., Zheng, J., Li, Z., & Xiao, X. (2020). A quasi-experimental study examining QR code-based video education program on anxiety, adherence, and satisfaction in coronary angiography patients. Contemporary Nurse, 56(5-6), 428-440. https://doi.org/10.1080/10376178.2020.1834910.
16. Hung, S. H. (2024, July). Enhancing medication adherence for schizophrenia patients in Taiwan through ICT interventions. In 2024 International Conference on Consumer Electronics-Taiwan (ICCE-Taiwan) (pp. 433-434). IEEE. https://doi.org/10.1109/ICCE-Taiwan.2024.00095.
17. Jachimowicz, J. M., Gladstone, J. J., Berry, D. A. N., Kirkdale, C. L., Thornley, T., & Galinsky, A. D. (2021). Making medications stick: Improving medication adherence by highlighting the personal health costs of non-compliance. Behavioural Public Policy, 5(3), 396–416. https://doi.org/10.1017/bpp.2019.1
18. Joshitha, K. L., Aravind, E., Akash, S., Suveka, S., Vardhan, J. H., & Siddeshwar, S. A. (2024, April). Design and development of AI-based QR-enabled pharmaceutical dispenser. In Proceedings of the International Conference on Communication, Computing and Internet of Things (IC3IoT) (pp. 1–6). IEEE.
19. Jazul, J. P., Arciga, T. M. G., Ante, M. A. C., Berlin, D. G. B., Ravana, L. F. L., Reyes, S. A., & Singh, J. (2021). Assessment of patient understanding of their conventional cardiac medicines and herbal prepared/derived products: Preliminary survey and interviews with selected community-dwelling elderly patients in the Philippines. Journal of Basic and Clinical Physiology and Pharmacology, 32(4), 403– 413. https://doi.org/10.1515/jbcpp-2020-0485.
20. Kilic, H. F., Dag, S., & MSc, S. (2020). The relationship between health literacy and medication adherence in a hypertensive patient population. International Journal of Caring Sciences, 13(1), 101–107.
21. Liu, F., Song, T., Yu, P., Deng, N., Guan, Y., Yang, Y., & Ma, Y. (2023). Efficacy of an mHealth app to support patients' self-management of hypertension: Randomized controlled trial. Journal of Medical Internet Research, 25, e43809. https://doi.org/10.2196/43809.
22. Lohrasbi, F., Ilali, E. S., Mousavinasab, S. N., & Yaghoubi, T. (2021). Factors associated with health literacy and medication adherence in elderly patients with chronic kidney diseases. Journal of Nursing and Midwifery Sciences, 8(2), 106–113. https://doi.org/10.4103/jnms.jnms_55_20.
23. Marengo, L. L., & Barberato-Filho, S. (2023). Involvement of human volunteers in the development and evaluation of wearable devices designed to improve medication adherence: A scoping review. Sensors, 23(7), 3597. https://doi.org/10.3390/s23073597.
24. Marseille, B. R., Commodore-Mensah, Y., Davidson, P. M., Baker, D., D'Aoust, R., & Baptiste, D. L. (2021). Improving hypertension knowledge, medication adherence, and blood pressure control: A feasibility study. Journal of Clinical Nursing, 30(19–20), 2960–2967. https://doi.org/10.1111/jocn.15768.
25. McGillicuddy, J. W., Chandler, J. L., Sox, L. R., & Taber, D. J. (2020). Exploratory analysis of the impact of an mHealth medication adherence intervention on tacrolimus trough concentration variability: Post hoc results of a randomized controlled trial. Annals of Pharmacotherapy, 54(12), 1185–1193. https://doi.org/10.1177/1060028020931806.

26. Oori, M. J., Mohammadi, F., Norouzi, K., Fallahi-Khoshknab, M., & Ebadi, A. (2019). Conceptual model of medication adherence in older adults with high blood pressure—An integrative review of the literature. Current Hypertension Reviews, 15(2), 85–92. https://doi.org/10.2174/1573402114666181022152313.
27. Paczkowska, A., Hoffmann, K., Kus, K., Kopciuch, D., Zaprutko, T., Ratajczak, P., ... & Bryl, W. (2021). Impact of patient knowledge on hypertension treatment adherence and efficacy: A single-centre study in Poland. International Journal of Medical Sciences, 18(3), 852–860. https://doi.org/10.7150/ijms.48139.
28. Pan, J., Wu, L., Wang, H., Lei, T., Hu, B., Xue, X., & Li, Q. (2019). Determinants of hypertension treatment adherence among a Chinese population using the therapeutic adherence scale for hypertensive patients. Medicine, 98(27), e16116. https://doi.org/10.1097/MD.0000000000016116.
29. Patel, T., Ivo, J., Faisal, S., McDougall, A., Carducci, J., Pritchard, S., & Chang, F. (2020). A prospective study of usability and workload of electronic medication adherence products by older adults, caregivers, and health care providers. Journal of Medical Internet Research, 22(6), e18073. https://doi.org/10.2196/18073.
30. Perez, C. D. A. (2022). Integration of geriatric content in entry-level physical therapy education in the Philippines: A pilot study. Philippine Journal of Physical Therapy, 1(2), 24–40.
31. Poulter, N. R., Borghi, C., Parati, G., Pathak, A., Toli, D., Williams, B., & Schmieder, R. E. (2020). Medication adherence in hypertension. Journal of Hypertension, 38(4), 579–587. https://doi.org/10.1097/HJH.0000000000002338
32. Rosa, J. G. L. D., Catral, C. D. M., Reyes, N. A., Opiso, D. M. S., Ong, E. P., Ornos, E. D. B., ... & Tantengco, O. A. G. (2024). Current status of hypertension care and management in the Philippines. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 27, 103008. https://doi.org/10.1016/j.dsx.2024.103008.
33. Sanati, T., Vaezi, A., & Jambarsang, S. (2020). Medication adherence status and its related factors among older adults in Yazd, Iran. Elderly Health Journal, 6(2), 85–90.
34. Saqlain, M., Riaz, A., Malik, M. N., Khan, S., Ahmed, A., Kamran, S., & Ali, H. (2019). Medication adherence and its association with health literacy and performance in activities of daily living among elderly hypertensive patients in Islamabad, Pakistan. Medicina, 55(5), 163. https://doi.org/10.3390/medicina55050163
35. Sartori, A. C., Rodrigues Lucena, T. F., Lopes, C. T., Picinin Bernuci, M., & Yamaguchi, M. U. (2020). Educational intervention using WhatsApp on medication adherence in hypertension and diabetes patients: A randomized clinical trial. Telemedicine and e-Health, 26(12), 1526–1532. https://doi.org/10.1089/tmj.2019.0244
36. Shadish, W. R., Cook, T. D., & Campbell, D. T. (2021). Experimental and quasiexperimental designs for generalized causal inference. Cengage Learning.
37. Shareinia, H., Sadeghmoghadam, L., Mokhtarzadeh, M. R., Zahrayi, S. M., Jafari, N., & Noori, R. (2020). Relationship between polypharmacy and medication adherence in the hypertensive elderly patients. Disease and Diagnosis, 9(4), 153–157.
38. Siddiqui, M., Judd, E. K., Dudenbostel, T., Gupta, P., Tomaszewski, M., Patel, P., ... & Calhoun, D. A. (2020). Antihypertensive medication adherence and confirmation of true refractory hypertension. Hypertension, 75(2), 510–515. https://doi.org/10.1161/HYPERTENSIONAHA.119.14052
39. Simon, S. T., Kini, V., Levy, A. E., & Ho, P. M. (2021). Medication adherence in cardiovascular medicine. BMJ, 374, n1493. https://doi.org/10.1136/bmj.n1493
40. Sison, J. A., Cawed-Mende, R. M., & Oliva, R. V. (2021). Prevalence, awareness, and treatment profile of adult Filipino hypertensive individuals: Philippine Heart
41. Association–Council on Hypertension Report on Survey of Hypertension (PRESYON4). Philippine Journal of Cardiology, 49(2), 53–68.
42. Suhat, S., Suwandono, A., Adi, M. S., Nugroho, H., Widjanarko, B., & Wahyuni, C. U. (2022). Relationship of health belief model with medication adherence and risk factor prevention in hypertension patients in Cimahi City, Indonesia. Evidence Based Care, 12(2), 51–56.
43. Stern, G. M., Pitlick, J. M., Stacy, Z. A., & Crannage, A. J. (2016). Conception of a personalized medication adherence discharge kit for rivaroxaban. Hospital Pharmacy, 51(1), 60–67. https://doi.org/10.1310/hpj5101-60
44. Zhou, T., Wang, R., Gu, S. J., Xie, L. L., Zhao, Q. H., Xiao, M. Z., & Chen, Y. L. (2022). Effectiveness of mobile medical apps in ensuring medication safety among patients with chronic diseases: Systematic review and meta-analysis. JMIR mHealth and uHealth, 10(11), e39819. https://doi.org/10.2196/39819

45. Turana, Y., Tengkawan, J., Chia, Y. C., Shin, J., Chen, C. H., Park, S., ... & Kario, K. (2021). Mental health problems and hypertension in the elderly: Review from the HOPE Asia Network. The Journal of Clinical Hypertension, 23(3), 504–512. https://doi.org/10.1111/jch.14160
46. Uchmanowicz, B., Jankowska, E. A., Uchmanowicz, I., & Morisky, D. E. (2019). Self-reported medication adherence measured with Morisky Medication Adherence Scales and its determinants in hypertensive patients aged ≥60 years: A systematic review and meta-analysis. Frontiers in Pharmacology, 10, 168. https://doi.org/10.3389/fphar.2019.00168
47. Vidad, D. Y., Ampatin, R. E. V., Baldomero, K., De Leon, G. K., Lopez, M. R., Nicandro, V. A., & Malana, J. (2022). Knowledge, attitude, and perception on antibiotic use and antimicrobial resistance among residents of Metro Manila, Philippines. International Journal of Arts, Sciences and Education, 3(4), 142–189.
48. Vreeland, K. C. B., Arteta, L. C. G., Basto, K. M. L., Cabaron, C. K. D., Chicombing, R. J. C., Dagayloan, A. J. B., ... & Andal, M. S. (2022). Public awareness, expectations, and views on community pharmacist's roles and practices in the Philippines. GSC Biological and Pharmaceutical Sciences, 20(1), 22–31. https://doi.org/10.30574/gscbps.2022.20.1.0220
49. Yazdanpanah, Y., Saleh Moghadam, A. R., Mazlom, S. R., Haji Ali Beigloo, R., & Mohajer, S. (2019). Effect of an educational program based on health belief model on medication adherence in elderly patients with hypertension. Evidence Based Care, 9(1), 52–62.

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APPENDIX A

Protocol

Project Title

"Effectiveness of VoxQR (Voice QR Code) in Enhancing Knowledge Medication Adherence for Geriatric Hypertensive Patients In Koronadal City "

Project Summary

The VoxQR system is designed to improve medication adherence and enhance knowledge about hypertension management among elderly hypertensive patients. This innovative technology uses voice-powered QR codes to provide accessible and understandable medication instructions, addressing common barriers such as low health literacy and cognitive decline. The goal of this study is to evaluate the effectiveness of VoxQR in enhancing medication adherence and patient education among elderly patients in Koronadal City. A quasi-experimental research design will be used in this study, involving elderly hypertensive patients aged 60 and older who meet specific inclusion criteria. Participants must be diagnosed with hypertension, able to use the VoxQR technology, and willing to participate in the study. The study aims to provide valuable insights into improving health outcomes for elderly hypertensive patients and inform future healthcare interventions.

Project Description

The VoxQR system is designed to provide elderly hypertensive patients with easy access to voice-powered medication instructions, improving their medication adherence and knowledge of hypertension management. The goal of the VoxQR system is to offer a userfriendly, voice-based platform where patients can quickly retrieve important medication information, such as dosage, timing, and potential side effects, directly from a QR code.

Rationale

Medication adherence is a significant concern among elderly hypertensive patients in the Philippines. VoxQR technology offers a novel solution by providing audio-based instructions to make medication regimens more understandable and accessible, improving adherence and health outcomes.

Objective

To develop VoxQR (Voice-powered QR codes) to improve medication adherence and knowledge among elderly hypertensive patients in Koronadal City.

Methodology

This presents the research design, locale of the study, sampling design or technique, respondents to the study, research instrument, data gathering procedure, ethical considerations, and the questionnaires.

Research Design

The researcher will utilize quantitative research design, quasi-experimental research design, which does not require random assignment of participants. It allows the assessment of the intervention’s effectiveness in pre-existing groups, making it suitable for this context where randomization is not feasible.

Research respondents or participants:

The participants of the study will be the elderly hypertensive patients aged 60 and older, selected through purposive sampling. Inclusion criteria include diagnosed hypertension, willingness to participate, ability to use VoxQR technology, and no severe cognitive impairment.

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Intervention

The researchers will develop and evaluate VoxQR Code. Participants will use the codes to access this content at their convenience, which will be evaluated for its impact on adherence and knowledge retention.To determine the effect of the VoxQR code, the researchers will distribute questionnaires containing questions. The responses to these questions will help the researchers understand and analyze the data gathered.

Ethical Consideration

The ethical considerations considered while conducting this study will be respect for the individual, confidentiality, and the informed consent of the respondents. The researchers will make sure to ensure rights, dignity, and privacy. To ensure the confidentiality of the respondents, the researchers carefully considered the relevant data and information supplied by them while conducting their analysis. They took necessary precautions to protect the anonymity of the respondents and maintain the integrity of the research process. The participants in this study have the right to decide whether or not to participate. To safeguard the privacy and protection of the data collected from the respondents, their personal information will not be disclosed in the research findings. The researcher will provide a consent form that must be approved by the research adviser. It is important to note that all potential risks and benefits of the study will be clearly explained to the respondents, and the researcher will take necessary measures to minimize any potential risks.

Purpose of the Study

You are being asked to take part in a research study. It's important that you understand the purpose and details of the study before deciding whether to take part. Please read the information provided carefully, and do not hesitate to ask the researcher any questions you may have. It is important that you feel informed before making your decision to participate.

The purpose of this study is to evaluate the effectiveness of VoxQr (Voice QR Code) technology in improving medication adherence and enhancing knowledge about hypertension management among geriatric patients in Koronadal City. This research aims to determine whether the use of VoxQr can help improve understanding of medication instructions and encourage better adherence to prescribed treatments for hypertension.

Study Procedures

1. **Introduction and Consent:** If you agree to participate in this study, you will first be provided with a full explanation of the study's purpose, procedures, and expectations.

You will be given an opportunity to ask any questions regarding the study. After ensuring that you fully understand the details, you will be asked to sign the consent form to officially participate.

2. **Training on Using VoxQr (Voice QR Code):** After providing your consent, you will undergo a brief training session on how to use the VoxQr system. During this session, you will be shown how to scan the QR code with your mobile device and listen to the voice-enabled instructions.

This will include instructions on how to access the medication-related audio content, how to ensure proper usage, and troubleshooting steps if needed. The training will be conducted by a member of the research team and will be tailored to your needs to ensure that you are comfortable using the technology.

3. **Implementation of VoxQr for Medication Adherence**: Once trained, you will begin using VoxQr technology to receive voice instructions about your prescribed medication. You will be expected to scan the QR code and listen to the audio instructions at regular intervals as part of your daily medication routine. These audio instructions will help reinforce the proper use of your medication, including the correct dosage and timing.

4. **Feedback Collection and Documentation**: As part of the study, you will be asked to provide feedback on your experience using the VoxQr system. This may include your thoughts on the ease of use, clarity of the instructions, and any difficulties encountered. The research team will document this feedback and may also

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collect information about your medication adherence through a simple recording process. The goal of this documentation is to track the impact of VoxQr on your medication knowledge and adherence. You will be asked for your consent before any documentation is made. The documentation will not be shared with anyone outside of the research team.

Benefits

By participating in this study, you may gain a better understanding of your hypertension medication regimen and how to manage it more effectively. This could help improve your medication adherence and overall health. Additionally, you may contribute to the development of new technologies and methods aimed at supporting geriatric patients with hypertension in managing their health more efficiently.

Risks

The risks involved in this study are minimal. However, you may experience discomfort or confusion while using the VoxQr technology or if you have difficulty understanding the audio instructions. If at any point you feel that the technology is causing you distress, you are free to discontinue your participation without penalty.

Confidentiality

All information collected from you during this study will be kept strictly confidential. Your personal information, including your health details, will be anonymized, and any data collected will only be used for the purposes of this research. Results will be reported in aggregate form and will not identify you personally. All records will be securely stored and only accessible to the research team.

Payment And Compensation

There is no cost to participate in this study, and you will not be required to make any payments.

Additionally, you will not receive any compensation for taking part in the study.

Contact Information

If you have any questions or concerns about the study or your participation, please do not hesitate to contact the principal investigator.

Name: Salman A. Amin

Contact Number: 09501463908

For any questions regarding your rights as a participant in this research, you may contact the Institutional Review Board (IRB) at (865) 354-3000, ext. 4822.

Time Commitment

The time commitment for participation includes a one-time training session lasting approximately 20–30 minutes. Following the training, you will spend about 5–10 minutes using the VoxQr system to follow your medication regimen. Additionally, you will provide feedback once a week, which will take about 10–15 minutes per session.

Voluntary Participation

Your participation in this study is entirely voluntary. You may choose to withdraw from the study at any time without any negative consequences or loss of benefits to which you are otherwise entitled. If you decide to withdraw, all data collected from you will be destroyed upon your request.

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Consent

I have read and understood the information provided, and I have had the opportunity to ask any questions. I understand that my participation is completely voluntary, and I can choose to stop at any time without any consequences. I have been given a copy of this consent form. I agree to participate in this study willingly.

Participant's signature: _____ Date: _____

Researcher's signature: _____ Date: _____

APPENDIX B

Questionnaires

Survey Questionnaire on "Effectiveness of VoxQR (Voice QR Code) in

Enhancing Knowledge Medication Adherence for Geriatric Hypertensive Patients in Koronadal City"

Purpose of the Study:

This study aims to evaluate the effectiveness of VoxQR (Voice-Powered QR Codes) in improving medication adherence and enhancing knowledge of hypertension among geriatric hypertensive patients in Koronadal City. Hypertension remains one of the leading causes of cardiovascular complications among older adults. Poor medication adherence is a major factor contributing to uncontrolled hypertension, leading to increased healthcare costs and reduced quality of life. By introducing VoxQR as an intervention, this study seeks to measure its impact on improving medication adherence, increasing patient knowledge, and achieving better blood pressure control.

Data Security & Privacy

Your responses will be kept private and used only for research purposes. All information will be stored securely in a password-protected file, and no names will be recorded—only coded for privacy. Once the research is completed, all paper documents will be shredded, and digital files will be permanently deleted.

General Instructions for Participants

- There are no right or wrong answers—please be honest.
- Your information will be kept private and confidential.
- If you need help, ask the researcher to explain the question to you.
- For any questions or further assistance regarding of the app, please feel free to contact us at 09291486870

PART I. Medication Adherence

This questionnaire aims to understand how the VoxQR system affects your medication adherence and knowledge about hypertension.

Direction: On a scale of 1 to 4, depending on your level of adherence, select the most appropriate number that you relate to. Please rate your answers using the scale below:

1 — Always 2 — Often 3 — Sometimes 4 — Never

Medication Adherence	**Always** (1)	**Often** (2)	**Some times** (3)	**Never** (4)
1.I take my hypertension medication exactly as prescribed by my doctor.				
2. I never forgot to take my medication.				

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3. I intentionally skipped a dose because I felt fine				
4. I never experience difficulty remembering when to take my hypertensive medication				
5. I don't have trouble understanding my hypertensive medication instructions.				
Post-Test only (After 7 days)				

1. Now, I take my hypertension medication exactly as prescribed by my doctor.
2. I feel more confident in taking my hypertensive medications correctly.
3. I no longer skip doses because of the VoxQR reminders.
4. VoxQR reminds me when to take my hypertensive medication.
5. I feel more confident in taking my hypertensive medications correctly.

Part II. Knowledge.

Instruction: Instruction: Please indicate your level of agreement with the following statements.

Scale:

1 — Strongly Disagree 2 — Somewhat Disagree 3 — Somewhat Agree 4 — Strongly Agree

Knowledge	**Strongly Disagree**(1)	**Somewhat Disagree** (2)	**Somewhat Agree** (3)	**Strongly Agree** (4)
1. I know that the normal blood pressure for adults is around 120/80 mmHg.				
2. I know that the main purpose of antihypertensive medication is to lower and maintain healthy blood pressure.				
3. I know the specific time of day I am supposed to take my blood pressure medication.				
4. I know the correct dosage of my antihypertensive medication.				
5. I am aware that missing doses of my antihypertensive medication can lead to health complications.				
POST TEST(After 7 days)				
1. I know that the normal blood pressure for adults is around 120/80 mmHg.				
2. I know that the main purpose of antihypertensive medication is to lower and maintain healthy blood pressure.				
3. Using VoxQR, I am aware of the specific time of day I need to take my blood pressure medication				
4. The app teaches me the correct dosage of my antihypertensive medication.				
5. Because of VoxQR, I am aware that missing doses of my antihypertensive medication can lead to health complications.				

The Questionnaire ends here.

Thank You for Your Participation!

Your responses will contribute to improving medication adherence strategies for geriatric hypertensive patients.

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Appendix C

Permission Letter

ST. ALEXIUS COLLEGE
Gen. San. Drive, City of Koronadal, South Cotabato, Philippines 09506, Tel.: (083) 228-2019, Fax: (083) 228-4015, Email: st.alexiuscollege@yahoo.com

RECEIVED
OFFICE OF THE CITY MAYOR
CITY OF KORONADAL
RECEIVED BY: Helen
DATE: 12/13/24 TIME: 4:45

06, December 2024

ATT. ELIORDO U. OGENA
City Mayor
General Santos Drive, Koronadal City, South Cotabato

Dear Att. Eliordo U. Ogena,

Subject: Request for Consent to Conduct Research in Koronadal City

I hope this letter finds you in good health. On behalf of the Pharmacy Department of St. Alexius College, I am writing to formally request your consent to conduct a research study within Koronadal City. The research project is titled **"Effectiveness of VoxQr (Voice-powered QR Codes) in Enhancing Knowledge Medication Adherence for Geriatric Hypertensive Patients in Koronadal City."**

This study aims to evaluate the effectiveness of VoxQr technology in improving medication adherence and enhancing medication knowledge among elderly hypertensive patients in our community. Given the growing importance of managing hypertension among the geriatric population, we believe this research could provide valuable insights and potentially improve the health outcomes for elderly patients in the city.

We kindly request your permission to carry out this research involving hypertensive patients in Koronadal City, while ensuring strict adherence to ethical guidelines and all necessary health protocols. We assure you that the study will be conducted with the utmost respect, confidentiality, and care for the participants involved.

Should you have any questions or require additional information regarding the research, please do not hesitate to contact us. We are hopeful for your approval and support for this meaningful project.

Thank you very much for your time and cor
Sincerely,

Sincerely,

Salman A. Amin
Leader
Pharmacy Department
St. Alexius College

Republic of the Philippines
Province of South Cotabato
City of Koronadal
OFFICE OF THE CITY M AYOR

Date: 12/13/24

DOC ENDE

For your info and appropriate action. Thanks.

By the authority of the City Mayor,

ELIZABETH S. PEREZ
Supervising Administrative Officer

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ST. ALEXIUS COLLEGE
Gen. San. Drive, City of Koronadal, South Cotabato, Philippines 09506, Tel.: (083) 228-2019, Fax: (083) 228-4015,

February 3, 2025

HON. ELEANOR A. BORJE
Barangay Captain
Barangay Zone IV, Koronadal City, South Cotabato

Dear Ma'am/Sir,

I hope this letter finds you in good health. On behalf of the Pharmacy Department of St. Alexius College, I am writing to formally request for permission to conduct our study at your Barangay, for our research with a titled **"Effectiveness of VoxQr (Voice QR Code) in Enhancing Knowledge Medication Adherence for Geriatric Hypertensive Patients in Koronadal City."** *The said* research aims to assess the effectiveness of VoxQr (Voice QR Code) technology in enhancing the knowledge and medication adherence among geriatric hypertensive patients in Koronadal City.

We look forward to receiving a favorable and honest response regarding this matter. Thank you.

Respectfully yours,

Salman A. Amin
Researcher

Kezia Zoe B. Alvero
Researcher

Roxanne A. Dela Cruz
Researcher

Denise Nicola D. Badajos
Researcher

Noted by:

Cynthia Claire Gumia, RPh,, ClinPharm
Researcher Adviser/Mentor

Approved by:

John Thomas C. Franco, RN, MAN, PhD

Appendix D

Research Questionnaire Validation

Name of the Validator : Mershen B. Gania, RPh, Clin Pharm, MSPh Educational Attainment of the Validator:

Education	Field of Specialization	Higher Education Institution
Bachelor's Degree	BS in Pharmacy Major in Clinical Pharmacy	UIC
Master's Degree	MS in Pharmacy	UIC
Doctorate Degree	PhD In Pharmacy (on-going)	UIC

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Research Studies Conducted:

Research Title	Research Role		Year
	Lead Researcher	Co- Researcher	
Characterization Of Phenolic Composition And Antioxidant Activity Of The Leaf And Stem Extracts Of Water Spinach (Ipomoea Aquatic Forsk.)	/		2014
"Level Of Knowledge, Awareness, And Acceptance Of Health Workers On Cannabinoid Integrated Medicine For Chronic Pain Management: A Convergent Approach."	/		2023
Destructive Fires: Lived Experiences Of Punta Dumalag-1 Matina Aplaya Residents In Fire Dilemma And Recovery		/	2023
Association Between The Mnsod Val16ala Polymorphism And The Development Of Diabetic Nephropathy: Evidence From A Meta-Analysis		/	2024

Relevant Experience in Validating Research Instruments:

Research Title	Year	Program	Higher Education Institution
Reseta: Ready, Set, Tag! An Integration Of The	2023	Bs Pharmacy	San Pedro College
Adverse Drug Reaction Reporting System Using Near Field Communication Tags In A Tertiary Hospital Of Davao City			
"Effectiveness Of RESETA PADALA Mobile Application Among Caregivers Of Senior Citizens In Koronadal City, South Cotabato	2023	BS Pharmacy	St. Alexius College
"A Quantitative Analysis On Hindrances To Pharmacist-Patient Commutation Induced By Community Pharmacy Settings In Davao City"	2023	BS Pharmacy	San Pedro College
Medispose: A Program Improving The Attitude And Knowledge Of Community Pharmacists On Proper Disposal Of Expired Pharmaceuticals In Davao City	2024	BS Pharmacy	San Pedro College
Perception And Expectation Of Community Physicians And Nurses On The Role Of Pharmacists In The Community In Davao City	2025	BS Pharmacy Major in Clinical Pharmacy	University Of Immaculate Conception

Direction: Please check the number of the rating that corresponds to your choice using the rating scale provided.

Rating Verbal Description

4 Excellent 3 Very Good

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MERSHEN B. GANIA

2 Good

1 Fair

1. CLARITY	**4**	**3**	**2**	**1**
The instructions in the survey questionnaire/interview schedule are clear, concise, understandable, and suited to the level of the respondents		/		
The questions in the survey questionnaire/interview schedule given are clear, concise, understandable, and suited to the level of the respondents/participants.	/			
2. ORGANIZATION	**4**	**3**	**2**	**1**
The questions/items in the survey questionnaire/interview schedule are organized in logical manner based on the statement of the problem of study/the grand tour question.		/		
3. APPROPRIATENESS	**4**	**3**	**2**	**1**
The questions/items in the survey questionnaire/interview schedule are appropriate and relevant to the study.	/			
The questions in the survey questionnaire/interview schedule were designed to answer appropriately and comprehensively the specific questions in the statement of the problem/grand tour question.	/			
4. ADEQUACY	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule is sufficient to gather information needed to answer questions in the statement of the problem/grand tour question.		/		
The survey questionnaire/interview schedule represents the coverage of the research adequately		/		
5. OBJECTIVITY	**4**	**3**	**2**	**1**
Each questions/items in the survey questionnaire/interview schedule requires only one specific answer and measures only one behavior.	/			
There are no items in the survey questionnaire/interview schedule which suggest bias on the part of the researcher/s.		/		
6. ATTAINMENT OF OBJECTIVES	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule as a whole fulfill the objectives of the study to which it was instructed.	/			
7. EVALUATION RATING SYSTEM	**4**	**3**	**2**	**1**
The rating system and the scale adopted is appropriate and relevant to all items.	/			
8. ETHICAL CONSIDERATIONS	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule includes a brief description on the purpose of the survey/interview and what data will be collected, how their responses will be used, and their right to withdraw at any time.	/			
Precautions to protect sensitive information by indicating protocols in securing storage and transfer methods, as data breaches can have severe consequences for both participants and the credibility of the research	/			

Comments and Suggestions

-MERSHEN B. GANIA

Research Questionnaire Validation

Name of the Validator : Mariabe P. Quinco, RPh MS Pharm

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"Integration of Braille Prescription Medication (BPM) Label within Compact Packaging for Selected Over-the-counter Drugs among Visually Impaired Young Adults."

Educational Attainment of the Validator:

Education	Field of Specialization	Higher Education Institution
Bachelor's Degree	BS Pharmacy	SPC, Davao City
Master's Degree	MS Pharm	UIC, Davao City
Doctorate Degree	PhD in Pharmacy(Dissertation II)	UIC, Davao City

Research Studies Conducted:

Research Title	Research Role		Year
	Lead Researcher	Co- Researcher	2020
PHYSICIANS – PHARMACISTS TEAM INTERVENTION IN ANTIMICROBIAL STEWARDSHIP IN HOSPITALS: A SYSTEMATIC REVIEW AND META-ANALYSIS	/		

Relevant Experience in Validating Research Instruments:

Research Title	Year	Program	Higher Education Institution

Mariabe P. Quinco, RPh, MS Pharm

Direction: Please check the number of the rating that corresponds to your choice using the rating scale provided.

Rating	Verbal Description
4	**Excellent**
3	**Very Good**
2	**Good**
1	**Fair**

1. CLARITY	**4**	**3**	**2**	**1**
The instructions in the survey questionnaire/interview schedule are clear, concise, understandable, and suited to the level of the respondents		/		
The questions in the survey questionnaire/interview schedule given are clear, concise, understandable, and suited to the level of the respondents/participants.		/		
2. ORGANIZATION	**4**	**3**	**2**	**1**
The questions/items in the survey questionnaire/interview schedule are organized in logical manner based on the statement of the problem of study/the grand tour question.		/		
3. APPROPRIATENESS	**4**	**3**	**2**	**1**
The questions/items in the survey questionnaire/interview schedule are appropriate and relevant to the study.			/	

The questions in the survey questionnaire/interview schedule were designed to answer appropriately and comprehensively the specific questions in the statement of the problem/grand tour question.			/	
4. ADEQUACY	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule is sufficient to gather information needed to answer questions in the statement of the problem/grand tour question.		/		
The survey questionnaire/interview schedule represents the coverage of the research adequately		/		
5. OBJECTIVITY	**4**	**3**	**2**	**1**
Each questions/items in the survey questionnaire/interview schedule requires only one specific answer and measures only one behavior.		/		
There are no items in the survey questionnaire/interview schedule which suggest bias on the part of the researcher/s.	/			
6. ATTAINMENT OF OBJECTIVES	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule as a whole fulfill the objectives of the study to which it was instructed.	/			
7. EVALUATION RATING SYSTEM	**4**	**3**	**2**	**1**
The rating system and the scale adopted is appropriate and relevant to all items.		/		
8. ETHICAL CONSIDERATIONS	**4**	**3**	**2**	**1**
The survey questionnaire/interview schedule includes a brief description on the purpose of the survey/interview and what data will be collected, how their responses will be used, and their right to withdraw at any time.	/			
Precautions to protect sensitive information by indicating protocols in securing storage and transfer methods, as data breaches can have severe consequences for both participants and the credibility of the research	/			

Comments and Suggestions

1.Lay out: Title in single indention only. Divide the questionnaire into 5 parts.

2.Demographic Profile is not part of the SOP but it still important to include. I added items 11-12.

3. If I may suggest to add LEVEL of SATISFACTION to assess the use of VoxQRcode. This will be part V and post test only. There are items in the MEDICATION ADHERENCE that be deleted or be included in the LEVEL OF SATISFACTION.

4. Give a short thank you statement after the last table.

5. Avoid jargon or medical terms, difficult for the respondents to understand. I suggest you will have a Tagalog translation of your Consent form and Questionnaire.

Mariabe P. Quinco, RPh, MS Pharm

Name of the Validator : Kimberly Jean B. Surmion

Educational Attainment of the Validator:

Education	Field of Specialization	Higher Education Institution
Bachelor's Degree	BS Pharmacy	St. Alexius College
Master's Degree	Masters in Pharmacy major in administrative and management	Philippine Women's University

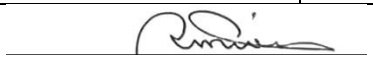
Doctorate Degreee	PHD in Pharmacy	Centro Escolar University

Research Studies Conducted:

Research Title	**Research Role**		**Year**
	Lead Researcher	Co- Researcher	

Relevant Experience in Validating Research Instruments:

Research Title	**Year**	**Program**	**Higher Education Institution**



Kimberly Jean B Surmion

(Name and Signature of Validator)

Direction: Please check the number of the rating that corresponds to your choice using the rating scale provided.

Rating	**Verbal Description**
4	**Excellent**
3	**Very Good**
2	**Good**
1	**Fair**

1. CLARITY	**4**	**3**	**2**	**1**
The instructions in the survey questionnaire/interview schedule are clear, concise, understandable, and suited to the level of the respondents		/		
The questions in the survey questionnaire/interview schedule given are clear, concise, understandable, and suited to the level of the respondents/participants.		/		
2. ORGANIZATION				
The questions/items in the survey questionnaire/interview schedule are organized in logical manner based on the statement of the problem of study/the grand tour question.		/		
3. APPROPRIATENESS				
The questions/items in the survey questionnaire/interview schedule are appropriate and relevant to the study.		/		
The questions in the survey questionnaire/interview schedule were designed to answer appropriately and comprehensively the specific questions in the statement of the problem/grand tour question.		/		
4. ADEQUACY				
The survey questionnaire/interview schedule is sufficient to gather information needed to answer questions in the statement of the problem/grand tour question.		/		
The survey questionnaire/interview schedule represents the coverage of the research adequately		/		
5. OBJECTIVITY				
Each questions/items in the survey questionnaire/interview schedule requires only one specific answer and measures only one behavior.		/		
There are no items in the survey questionnaire/interview schedule which suggest bias on the part of the researcher/s.		/		

6. ATTAINMENT OF OBJECTIVES					
The survey questionnaire/interview schedule as a whole fulfil the objectives of the study to which it was instructed.	l		/		
7. EVALUATION RATING SYSTEM					
The rating system and the scale adopted is appropriate and relevant to all items.			/		
8. ETHICAL CONSIDERATIONS					
The survey questionnaire/interview schedule includes a brief description on the purpose of the survey/interview and what data will be collected, how their responses will be used, and their right to withdraw at any time.				/	
Precautions to protect sensitive information by indicating protocols in securing storage and transfer methods, as data breaches can have severe consequences for both participants and the credibility of the research					

Comments and Suggestions

Add a short description about the purpose of the study. Include how many days you are going to measure the blood pressure after pre test. Include the need for contact details for post test conduct.

KIMBERLY JEAN B SURMION

(Name and Signature of Validator)

Appendix E

Certificate Of Developer Of Voxqr Code

Appendix F

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Certificate Of Proofreading

This document certifies that the thesis mentioned below was reviewed and edited for proper English language, grammar, punctuation, spelling, and overall style by the undersigned. Neither the research content nor the author's intentions were altered in any way during the editing process.

Thesis Title

Effectiveness Of Voxqr (Voice Qr Code) In Enhancing Knowledge Medication Adherence For Geriatric Hypertensive Patients **in Koronadal City**

Thesis Authors

Alvero, Kezia Zoe B.

Amin, Salman A.

Badajos, Denise Nicola D. Dela Cruz, Roxanne A.

YEAR AND PROGRAM

lll – Bachelor of Science in Pharmacy

DATE ISSUED

May 13, 2025

SHIELA MAE C. SILVA, LPT

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SHS English Teacher- St. Alexius College, Inc – ISD-SHS

APPENDIX G

Documentation




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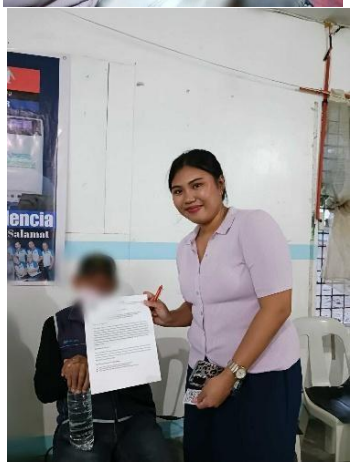









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Appendix H Gantt Chart