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Medical Record Management System of Baung Health Center

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ABTRACT

This study is focused on the design, development and implementation of a Medical Record Management System (MRMS) for Baung Health Center, aimed at replacing the existing manual, paper-based record-keeping system. The primary objectives included designing a database to store medical records, creating a user-friendly interface for authorized personnel, ensuring data security through reliable backup systems, and providing accurate printed medical records. Utilizing the Rapid Application Development (RAD) methodology, the system was developed through phases of requirements planning, prototyping, testing, and deployment. The implementation of the MRMS was expected to enhance the efficiency and accuracy of managing patient records, reduce the risk of errors, and improve overall patient care. The new system provided a standardized method for recording and accessing patient information, addressing the current challenges of time-consuming and error-prone processes. The study highlighted the significant benefits of the MRMS in streamlining operations, safeguarding sensitive patient data, and supporting healthcare providers in delivering quality care. The findings suggested that the MRMS not only improved the management of patient information but also served as a valuable model for other healthcare facilities considering similar upgrades.

Keywords: *Medical Record Management System (MRMS), Data security, Rapid Application Development (RAD), Patient records, Healthcare efficiency*

INTRODUCTION

Barangay Health Center is a community-based organization that provides first aid, maternal and child health care, diagnosis of social diseases, and other basic health services to all the members of the community it is serving. It serves as the first point of contact between the residents of the community and other health care facility levels. Barangay Health Centers are essential components of the health care system in the Philippines as they provide essential health services and play a significant role in promoting the health and well-being of the community. But it is crucial in Barangay Health Centers to have a good record management in order to ensure the accuracy, completeness, and confidentiality of patient information. Proper documentation of patient visits, medical history, diagnoses, and treatment plans are essential for effective patient management, continuity of care, and monitoring of health outcomes. It also enables health care providers to identify health trends, track disease prevalence, and evaluate the effectiveness of health interventions.

One of the biggest challenges that healthcare providers face in barangay health center is the use of paper-based record. This system is prone to errors and loss of important information, which can negatively impact patient care. The lack of standardization in record management also makes it difficult to share information among healthcare providers in different locations. These challenges can result in a delay in providing the necessary treatment to patients, leading to poor health outcomes.

The Baung Health Center located in Barangay Baung, Piat, Cagayan, Philippines is a government-owned healthcare facility serving a small population of 1,446 individuals distributed across 378 households and 450 families. The current paper-based medical record management system poses challenges such as time-consuming and error-prone patient record management, delays in accessing patient records, difficulty in tracking patient history and medical trends, and increased risk of errors in prescription and medication dispensing.

The proposed system is an electronic medical record-management system that will streamline the process of recording and managing medical records. It will provide healthcare providers with a standardized system for recording and accessing patient information, reducing the risk of errors and loss of information. The system will also be designed to be user-friendly, ensuring that users can easily navigate the system and record information accurately.

The proposed system will benefit the agency in many ways. It will improve the quality of care provided to patients, reduce the time spent on paperwork, and allow for better coordination among healthcare providers. The system will also provide valuable data for analysis, enabling healthcare providers to make informed decisions about patient care and resource allocation.

The Medical Record Management System for Baung Health Center is a much- needed initiative to address the challenges faced by healthcare providers in Barangay Health Centers. The proposed system will improve the quality of care provided to patients, reduce the risk of errors and loss of information, and provide valuable data for analysis. The implementation of this system will require a significant investment of resources, but the benefits far outweigh the costs.

OBJECTIVES OF THE STUDY

The general objective of this study is to develop a Medical Record Management System for Baung Health Center to replace the manual system.

Specifically, it will:

- design a database for storing the medical records of

residents in Baung Piat, Cagayan.

- develop a user-friendly interface that allows authorized personnel to access and manage patient records efficiently.
- provide a secure and reliable backup system t prevent data loss or data damage.
- produce an accurate and printed medical records

MATERIALS AND METHODS

The diagram below (Figure 1) depicts the stages and phases of the development of Medical Record Management System of Baung Health Center. It entails requirements planning, prototyping, testing, and cutover.

Figure 1. Rapid Application Development

Technology Used

The front end of the system was developed using the VB.NET programming language, an object-oriented language that offers a vast set of features for creating highperformance, scalable applications. In addition, the proposed system utilized MySQL for the backend, an open-source database management system known for its robust features and scalability. The database provided efficient data storage and retrieval mechanisms for managing large volumes of patient data.

System Requirements

User Requirements:

- Computer Literate
- Authorized personnel of the agency

Software Requirements:

- Operating system
- Microsoft Windows 10
- Microsoft Visual Basic .Net 2013
- XAMPP
- MySQL
- Microsoft Office

Hardware Requirements:

- Monitor
- Keyboard
- Mouse
- Minimum of 10GB Hard Disk Drive
- Printer

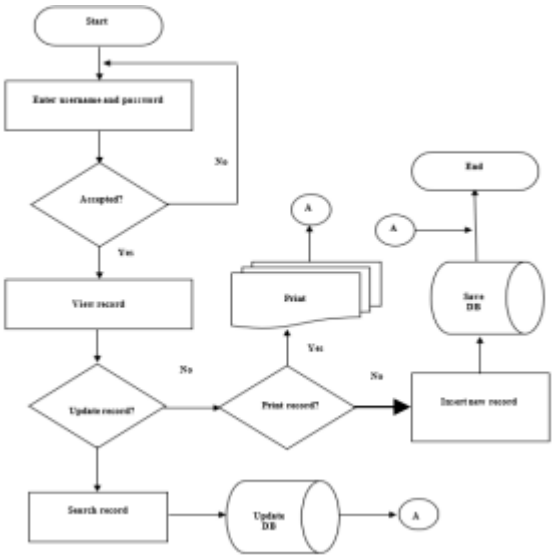

Figure 2. Operational Flowchart

RESULTS AND DISCUSSION

Once the necessary data and information were obtained, the system was designed, programmed, and tested. The following are some examples of forms. Based on the process, the system user selects from the available transactions (Figure 3).

Figure 3: The Log in

The user will be required to enter their correct login credentials (e.g., username and password). Otherwise, the system will display Message box indicating an invalid username or

password with the remaining login attempts left.

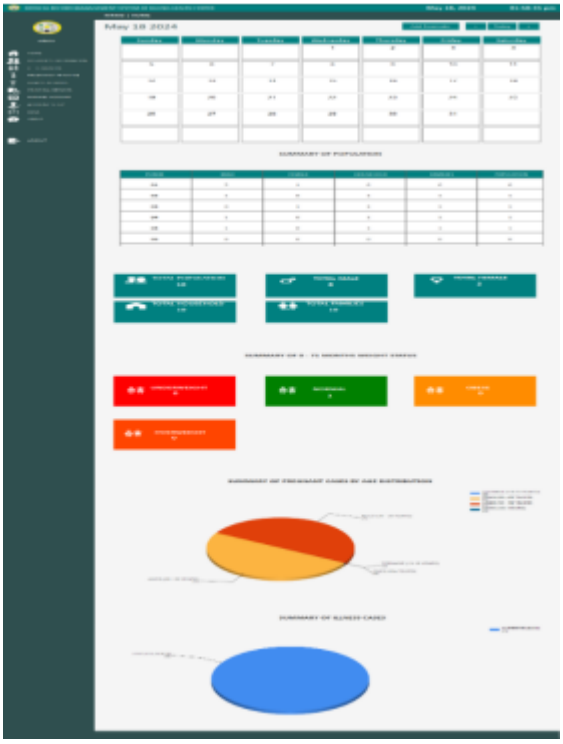

Figure 4: The home page

The home page of the system contains the calendar, summary of population, summary of 0- 71 months' records, pregnancy, and illness cases

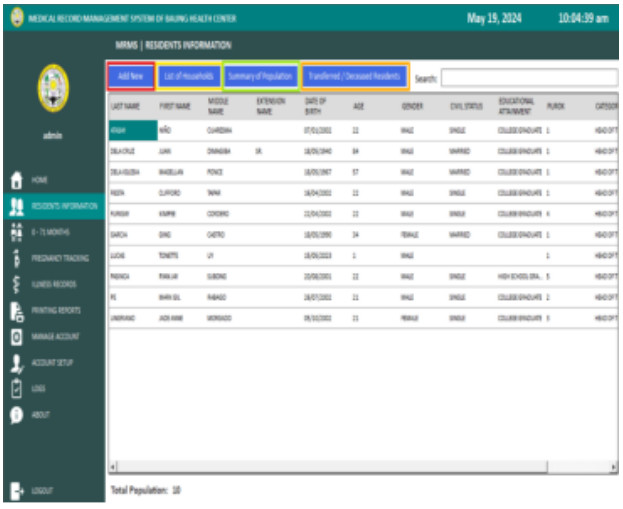

Figure 5: Residents Information Form

It contains elements such as buttons (Add New (Figure 5.1), List of Households (Figure 5.2), Summary of Population (Figure 5.3), and Transferred/Deceased Residents (Figure 5.4)), a table containing all the records of the residents, and a search bar to search for a table containing all the records of the residents, and a search bar to search for a particular resident.

Figure 5.1: Add New Residents Information form

Here, the user can add a resident's basic information and indicate their category (Member or Household Head). If the resident is a household member, the interface will appear as shown in Figure 5.4.1, allowing the user to either type the Household Head's name to automatically populate the Household No. textbox, or vice versa. However, if the category is Household Head, the "Head of the Family" combobox will not be shown, and the user will type the Household number instead. Additionally, a minor feature is incorporated where the age calculation based on the birthday is included, reducing errors in the record.

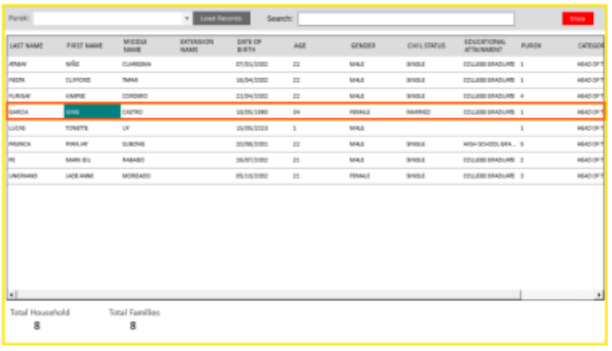

Figure 5.2: List of Households

This displays the list of household heads, and when clicked, it will show Figure 5.2.1 with complete and more detailed information about

a household.

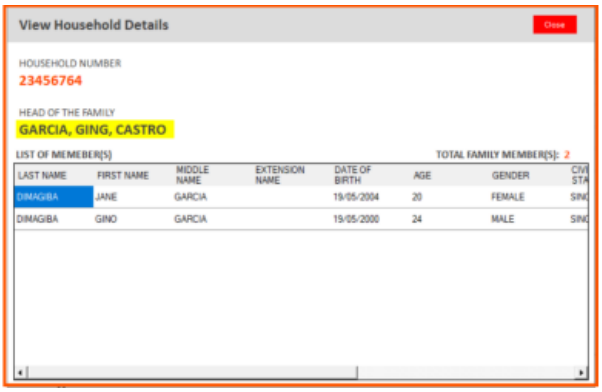

Figure 5.2.1: View form of Household's details

Here, detailed information about one household is displayed. It includes the household head, household number, household members, their details, and the total number of household members.

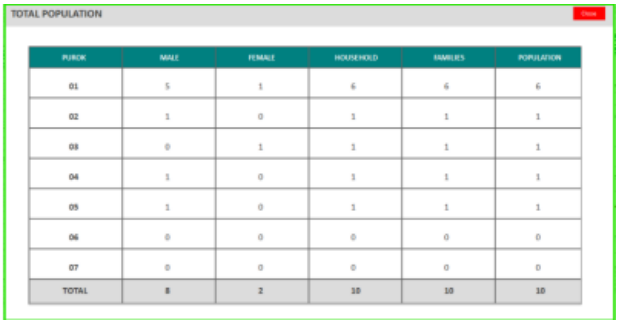

Figure 5.3: Summary of Population form

This shows a detailed summary of the population per purok, including the number of males and females, households, and families per purok.

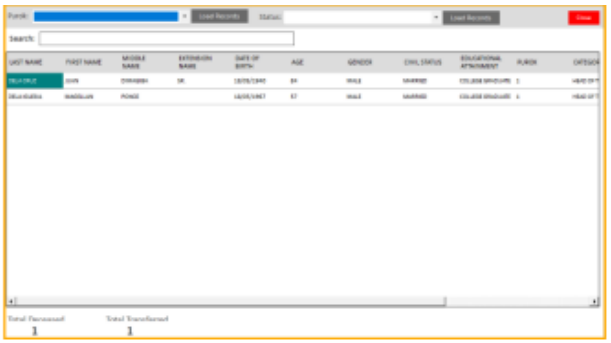

Figure 5.4: Transferred/Deceased Residents form

This shows the list of residents who have been transferred or deceased. It serves as an archive of such records to preserve data.

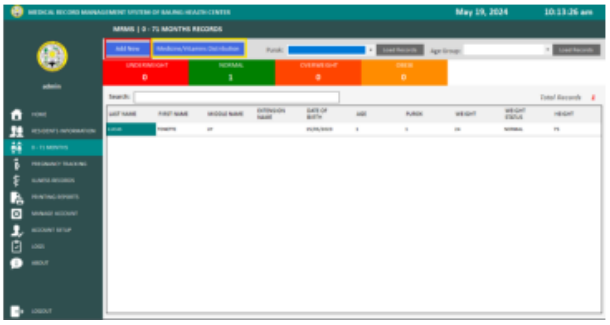

Figure 6: 0 – 71 Months form

In this form, there are buttons for adding new records for children aged 0-71 months (Figure 6.1), which will be displayed in the table. Additionally, there are buttons for medicine/vitamin distribution (Figure 6.2), filtering features for the 0-71 months records (either by purok or age group). It also includes boxes that display the total records by weight status, and a search bar to find a specific record.

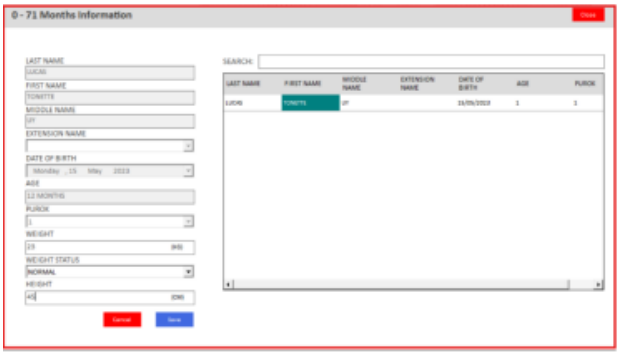

Figure 6.1: 0 – 71 Months form

Here, when the user clicks on a particular cell, that record will automatically populate the textboxes. The user can then add more details such as weight, weight status, and height of children aged 0-71 months.

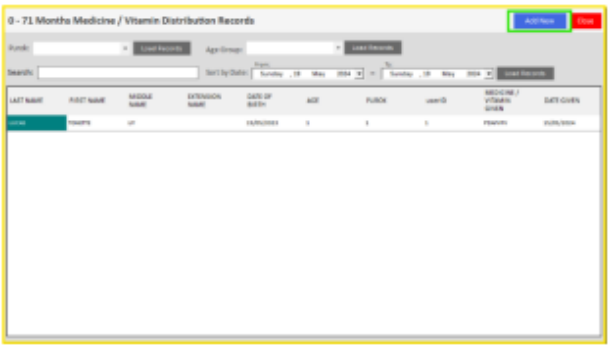

Figure 6.2: Adding 0-71 Months Distribution of Medicines/Vitamins Records

Here, the user will be able to add a new record by clicking on the table, and that record will populate the textboxes, enabling the user to add more details such as the medicine or vitamin to be given, as well as the date given.

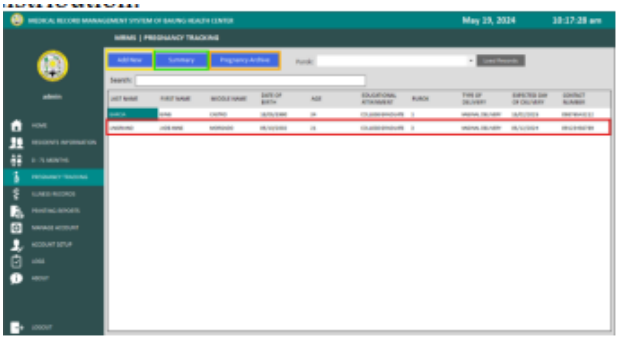

Figure 7: Pregnancy Tracking

In this form, functionality is included such that clicking on the table of pregnancy records enables the user to modify a certain record (Figure 7.1), and the edited record will then be moved in the pregnancy archive. Additionally, there are buttons for adding a new pregnancy record (Figure 7.2), a summary of pregnant women by age group.

It also includes filters by purok and search functionality where users can search for a particular record.

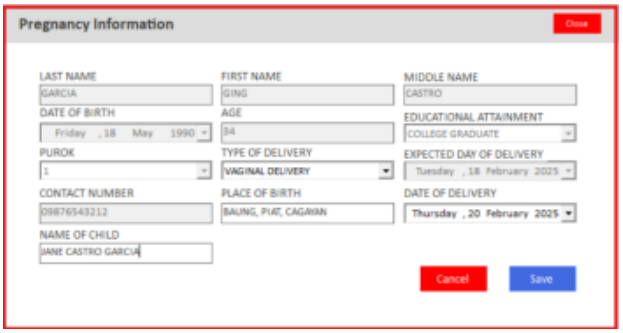

Figure 7.1: Updating Pregnant Record

When the pregnant woman has already delivered her baby, the user can then update the record, which will automatically remove it from the pregnant list and move it to the pregnancy archive.

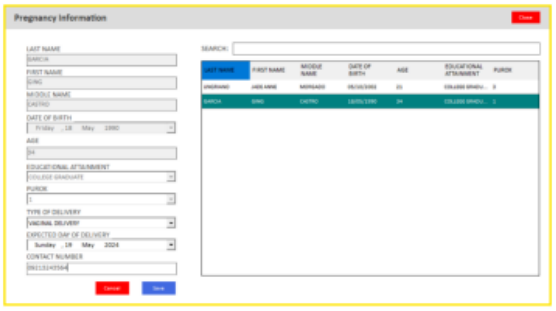

Figure 7.2: Adding New Pregnant Record

To add a new pregnant record, the user should first select a woman from the table whose age is 13 or older. Then, upon clicking on her entry, the relevant information will be populated in the textboxes. Subsequently, the user can proceed to add further details regarding the pregnancy.

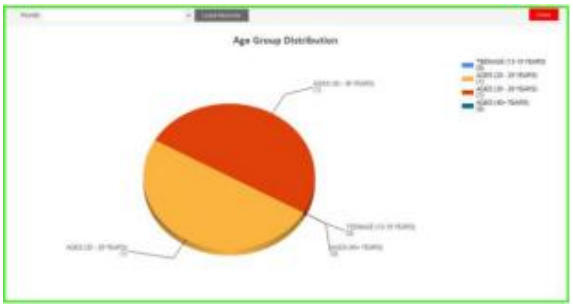

Figure 7.3: Summary of Pregnant Record

This section presents a pie chart depicting pregnant women by age group, which is effective for classifying teenage pregnancy. Additionally, a filter by purok is included to determine which purok has the highest records of pregnancy, especially teenage pregnancy.

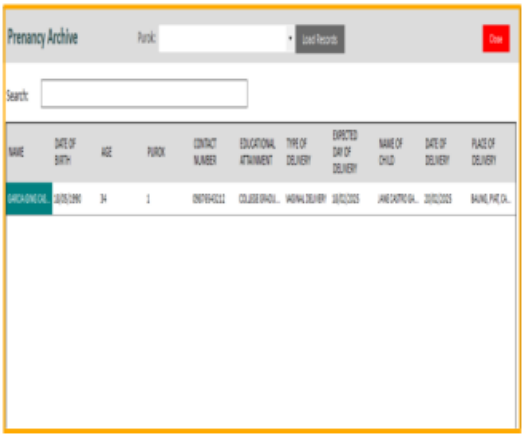

Figure 7.4: Pregnant Records Archive

The pregnancy archive form displays the updated

records from the update form (Figure 7.1) of women who have successfully delivered their babies.

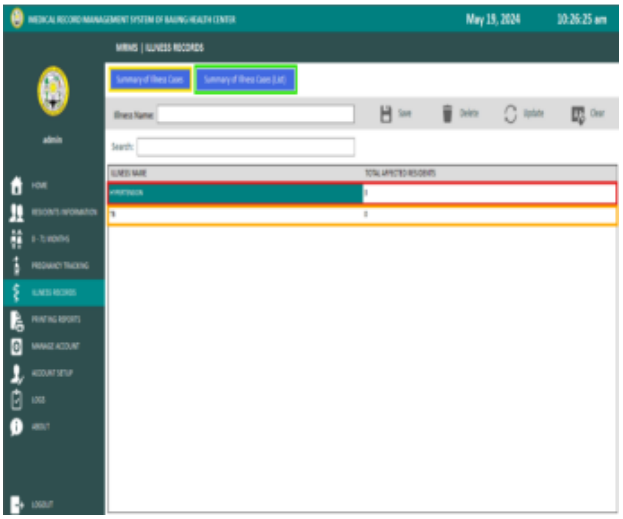

Figure 8: Illness Records

In this form, the user can view the summary of illness cases by a pie chart (Figure 8.1) or by list (Figure 8.2). Before adding a new illness case, the user must first add an illness name in the "Illness Name" textbox and save it using the save button. If the user wishes to modify an illness (e.g., delete or update), they can click on the illness in the table, and it will be populated in the "Illness Name" textbox. Additionally, the user can add and view illness cases by clicking on the illness name in the table, which will make the "Add New" and "View Records" buttons appear (Figure 8.3).

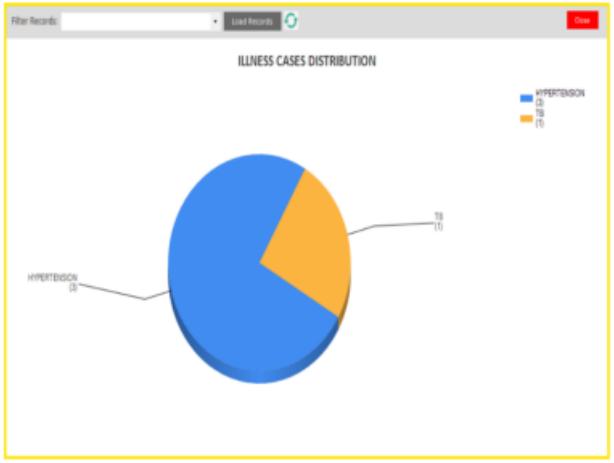

Figure 8.1: Pie Chart of Illness Cases

This chart displays the total number of recorded illness cases. Additionally, the user can filter the records by purok to further assess the cases in the barangay. Furthermore, a refresh button is incorporated to update the data on the chart after it is filtered by purok.

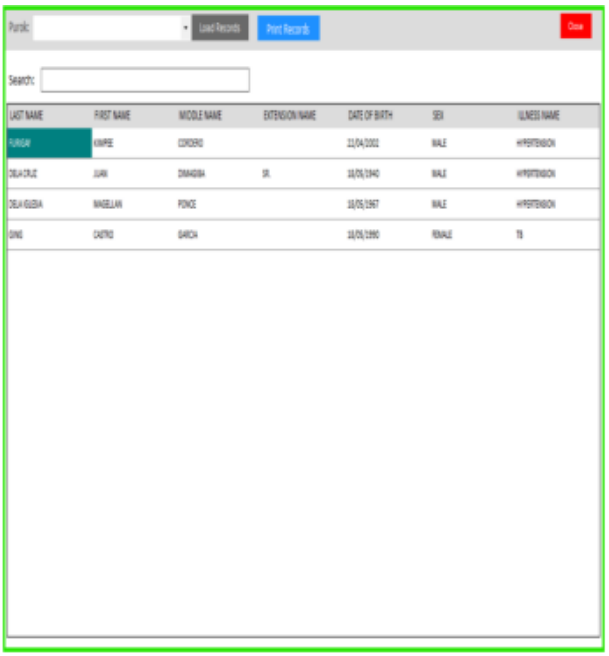

Figure 8.2: List of Illness Cases

Here, the cases of illnesses are displayed in a list format, with a filter by purok also incorporated. Additionally, a print button is available if the user needs to generate a report.

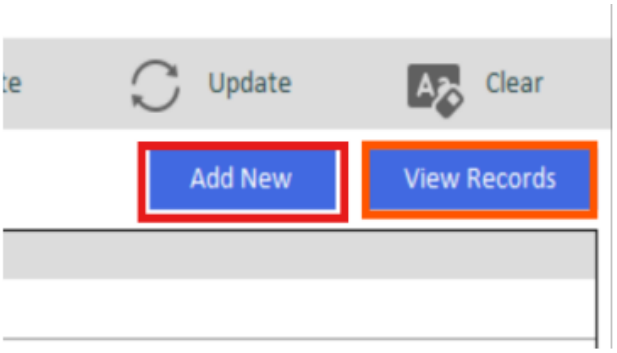

Figure 8.3: List of Illness Cases

These two buttons will show different interfaces depending on which illness is clicked. For a special instance like "Hypertension," it will show an interface exclusive to Hypertension: adding a new case (Figure 8.4A) and viewing cases (Figure 8.5A). For other illnesses, it will show an interface for adding (Figure 8.4B) and viewing (Figure 8.5B) cases.

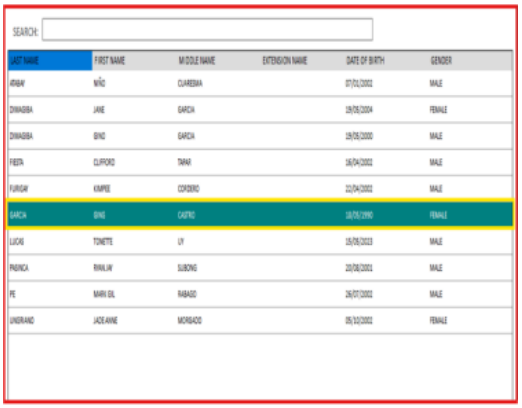

Figure 8.4A: Adding Hypertensive Case

To add a new case of hypertension, the user should click on the specific resident, which will then show (Figure 8.4A.1). If the user has trouble finding a particular resident, they can use the search bar for easier access.

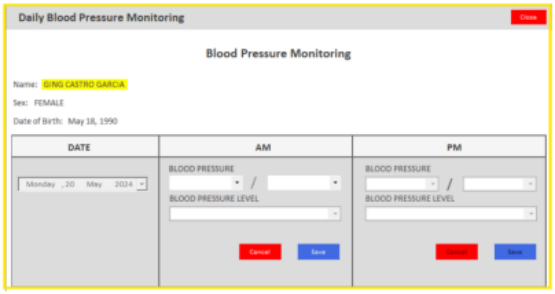

Figure 8.4A.1: Adding New Hypertension Case

Here, the user will input the systolic and diastolic blood pressure of the person, and the blood pressure level will be automatically displayed based on these values. Additionally, hypertensive patients are required to be monitored in the morning (AM) and afternoon (PM), so the newly added record will be shown in Figure 8.5A.2.

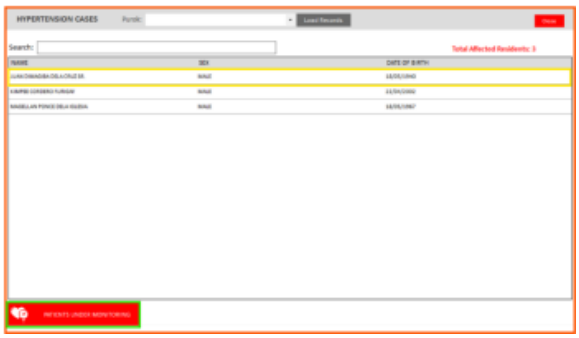

Figure 8.5A: View form of the Hypertension Cases

Here, the list of recorded hypertension cases is displayed. The user can filter records by purok, and the total number of records can also be seen. Additionally, when a record is clicked from the table, (Figure 8.5A.1) will appear. Moreover, this form includes a button to view the patients under monitoring (Figure 8.5A.2).

Figure 8.5A.1: Detailed Blood Pressure Monitoring of a Patient

In this form, the user can view the monitoring details of a patient's blood pressure. Additionally, the user can print the detailed report.

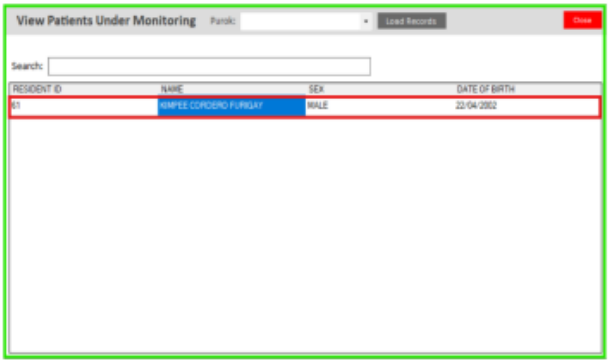

Figure 8.5A.2: View Patients Under Monitoring

Hypertensive patients are required to be monitored. By clicking on a particular hypertensive patient from the table, their detailed monitoring information will be displayed (Figure 8.5A.2.1).

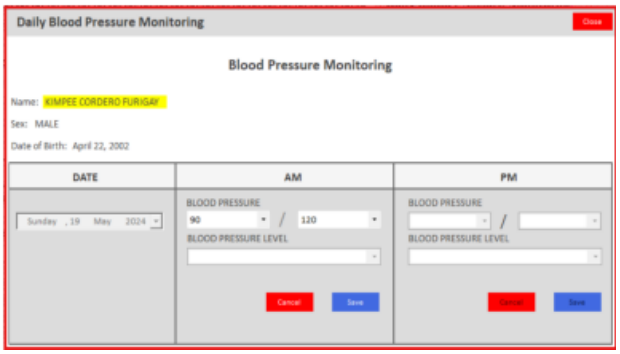

Figure 8.5A.2.1: Updating Blood Pressure Monitoring

The user will then be able to add the patient's systolic and diastolic blood pressure for the afternoon.

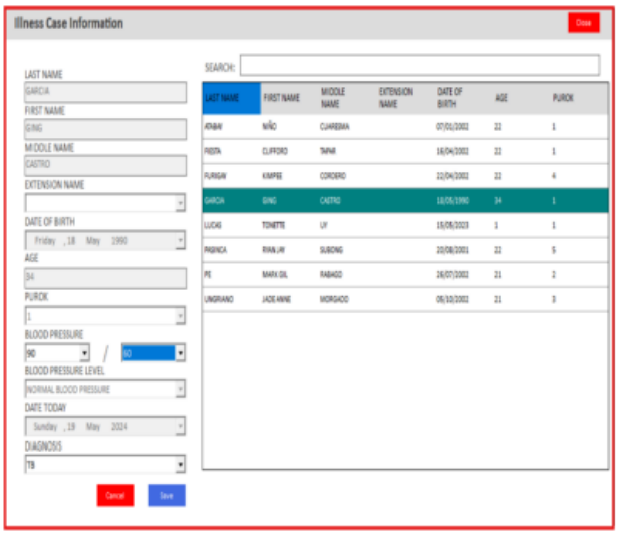

Figure 8.4B: Adding New Illness Case

This is the interface for adding a new illness case when it is not "Hypertension." A table consisting of residents' information is provided, and when clicked, the data will be populated in the textboxes. Then, the user can add further information like blood pressure, with the blood pressure level automatically displayed based on the values. Additionally, the date is automatically set to "Today" as the actual date the case was recorded. Moreover, the diagnosis is automatically populated based on the clicked illness from Figure 8.

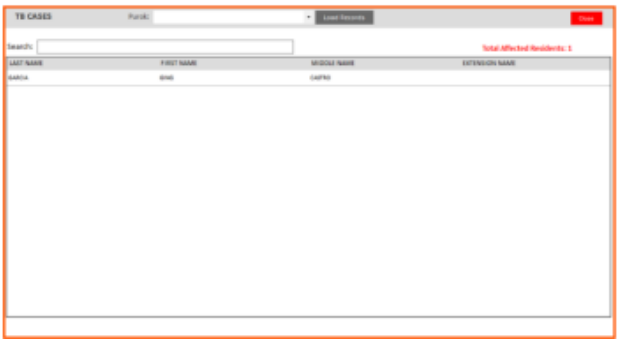

Figure 8.4B: Viewing Illness Cases of a Specific Illness clicked on in Figure 5.7.

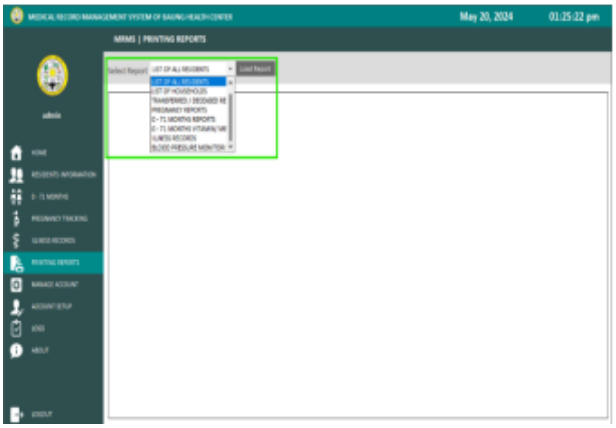

Figure 9: Printing Reports

Here, the user will choose a particular report from the combo box. For example, “List of All Residents.”

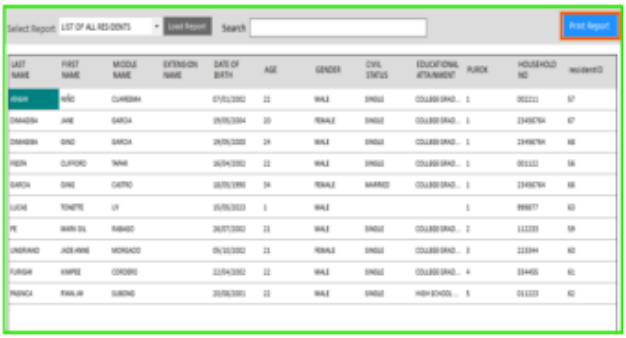

Figure 9.1: Printing Reports

The selected report will be displayed here. Additionally, a search feature will appear so that if the user needs to generate an individual report, they may do so by clicking on the record of the specific person. Moreover, the Print button will also appear as soon as the report is shown in this table.

CONCLUSION AND RECOMMENDATIONS

Based on the findings, the researchers conclude that the Medical Record Management System of Baung Health Center is accurate, up-to-date, and contributes to the advancement of computerization within the health center, thereby streamlining its operations. The system proves highly effective in adding personal information and updating reports for residents, providing easy access to each resident's medical records within the health center. Given the functionality of the system, the researchers strongly recommend the adoption and utilization of the Medical Record Management System at Baung Health Center.

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