DentaWeb: A Web-based Patient Information and Scheduling System

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BACKGROUND OF THE STUDY

In recent years, the healthcare industry has witnessed significant changes through the incorporation of advanced technologies. The development of Patient Information and Scheduling Systems plays a pivotal role in enhancing patient care within clinical settings. The study, led by Hübner et al. in 2020, delves into the intricacies of these systems, emphasizing their role in improving patient satisfaction and healthcare efficiency. The decentralized authority and dynamic nature of healthcare settings present challenges that are being addressed through the adoption of software solutions to replace manual scheduling. Our study's objectives center on examining key components of these systems, with a strong emphasis on usability and user-centered design, with the goal of contributing to the enhancement of patient healthcare journeys within clinical settings.

REVIEW OF RELATED LITERATURE

In recent years, healthcare has evolved with advanced information systems. This review covers key research areas, highlighting ethical concerns in Clinical Information Systems, the need for user-friendly patient info systems, and the quest for more efficient electronic patient records. It explores web-based appointment systems, Health Information Systems in patient safety, and improving patient flow. Additionally, it assesses how Clinical Information Systems can cut clinical errors and costs. Digital patient portals and Fast Pass for appointments are discussed. These studies offer insights into the impact of information systems on healthcare, emphasizing the importance of ongoing research to enhance healthcare quality.

RATIONAL AND SIGNIFICANCE

This study explores Patient Information and Scheduling Systems in healthcare, emphasizing their role in improving patient satisfaction and operational efficiency. These systems are essential in modern healthcare, replacing manual processes. The research focuses on usability and user-centered design. Its significance lies in advancing healthcare delivery and addressing broader impacts like ethics, user-centered design, and efficiency. Continuous research and development are essential to enhance healthcare services.

HIGHLIGHTING GAPS IN KNOWLEDGE

In the realm of Patient Information and Scheduling Systems in healthcare, crucial knowledge gaps demand further exploration. These gaps encompass practical methodologies for user-centric design, integrating ethics education into system development, optimizing patient flow and operational efficiency, and understanding the impact of digital patient engagement. Challenges related to interoperability, health equity, long-term impacts, cybersecurity, and healthcare professionals' adoption warrant additional investigation. Closing these gaps is vital for enhancing patient care and healthcare efficiency through these systems.

TRANSITIONING TO THE RESEARCH PROBLEM

In the changing healthcare landscape, which now includes advanced patient information and scheduling systems, there's a clear need for more research. Despite these systems being widely used in medical facilities, there hasn't been enough thorough research into how they truly affect patient care, ease administrative tasks, and enhance overall healthcare efficiency. This study aims to answer the key question: "How do advanced patient information and scheduling systems in medical settings improve healthcare delivery, make administrative tasks more efficient, and elevate the patient experience?"

NEEDS ASSESSMENT

RESEARCH METHODOLOGY

In this study, we used a mixed-method research strategy, combining quantitative and qualitative methodologies, to gain a comprehensive understanding of the subject matter.

Mixed Methods Research – Different Types & Examples. (2022, February 9). Bachelor Print.
https://www.bachelorprint.com/methodology/mixed-methods-research/

TYPES OF RESEARCH DATA COLLECTION AND INSTRUMENTS USED

INTERVIEW

1. What existing systems or tools are currently in use for managing patient information and scheduling, if any?

2. What specific challenges or problems are you currently facing due to the absence of a Patient Information and Scheduling System?

3. What is your primary goal in implementing a PIS?

4. What are your preferences regarding the accessibility and usability of the PIS for your staff and patients?

5. What specific features or functionalities do you envision for the PIS to meet your needs?

6. What kind of patient information do you need to store and manage within the system?

7. What devices or platforms should the system be compatible with for easy access?

8. What are the key challenges or pain points you hope this system will address?

Figure 1. Research Questionnaire was used during the interview.

TYPES OF RESEARCH DATA COLLECTION AND INSTRUMENTS USED

SURVEY

Research Title: "Patient Information and Scheduling System"
Name (Optional):_____Sex:_____ Age:_____

1. Have you ever used a Patient Portal to access your medical information and schedule appointments before?
   [ ] Yes   [ ] No
2. Are you aware of the existence of patient portals offered by healthcare providers or organizations?
   [ ] Yes   [ ] No
3. Would you be more likely to schedule appointments with your healthcare provider if you could do it online through a Patient Portal?
   [ ] Yes   [ ] No
4. Are you concerned about the security of your medical information when using an online Patient Portal?
   [ ] Yes   [ ] No
5. Would you prefer to receive e-prescriptions through a Patient Portal rather than traditional paper prescriptions?
   [ ] Yes   [ ] No
6. Is the ability to view your medical history, including past diagnoses and treatments, important to you when using a Patient Portal?
   [ ] Yes   [ ] No
7. Would you be more likely to recommend a healthcare provider that offers a user-friendly Patient Portal to friends and family?
   [ ] Yes   [ ] No

8. Do you believe that having a Patient Portal would make it more convenient for you to access your medical information, such as e-prescriptions and test results?
   [ ] Yes   [ ] No
9. If your healthcare provider recommended using a patient portal for managing your healthcare, would you be inclined to use it?
   [ ] Yes   [ ] No
10. do you believe that implementing a Patient Portal would enhance your healthcare experience?
   [ ] Yes   [ ] No
11. What specific features or functionalities would you expect from a Patient Portal to meet your healthcare needs better? (Please list any features you have in mind.)
_____
_____
_____

12. How important is it to you that the Patient Portal is accessible via mobile devices (smartphones and tablets) for on-the-go access to your health information?
   [ ] Very important   [ ] Somewhat important
   [ ] Not very important   [ ] Not important at all
13. On a scale of 1 to 5, how important is it to you that the Patient Portal is accessible via mobile devices (smartphones and tablets) for on-the-go access to your health information?
   [ ] 1 (Not important at all)   [ ] 2 (Slightly important)
   [ ] 3 (Moderately important)   [ ] 4 (Very important)
   [ ] 5 (Extremely important)
14. How confident are you that a Patient Portal would enhance your overall healthcare experience?
   [ ] 1 (Not confident at all)   [ ] 2 (Slightly confident)
   [ ] 3 (Moderately confident)   [ ] 4 (Very confident)
   [ ] 5 (Extremely confident)
15. Overall, do you believe that implementing a Patient Portal would enhance your healthcare experience?
   [ ] Yes   [ ] No

Additional Comments and Feedback: *(Please share any additional comments, suggestions, or concerns you may have regarding the implementation of a Patient Portal for accessing your medical information and scheduling appointments.)*
_____
_____
_____

Figure 2. Questionnaire used to conduct a survey

TABLE 1. CLIENTS RESPONSE

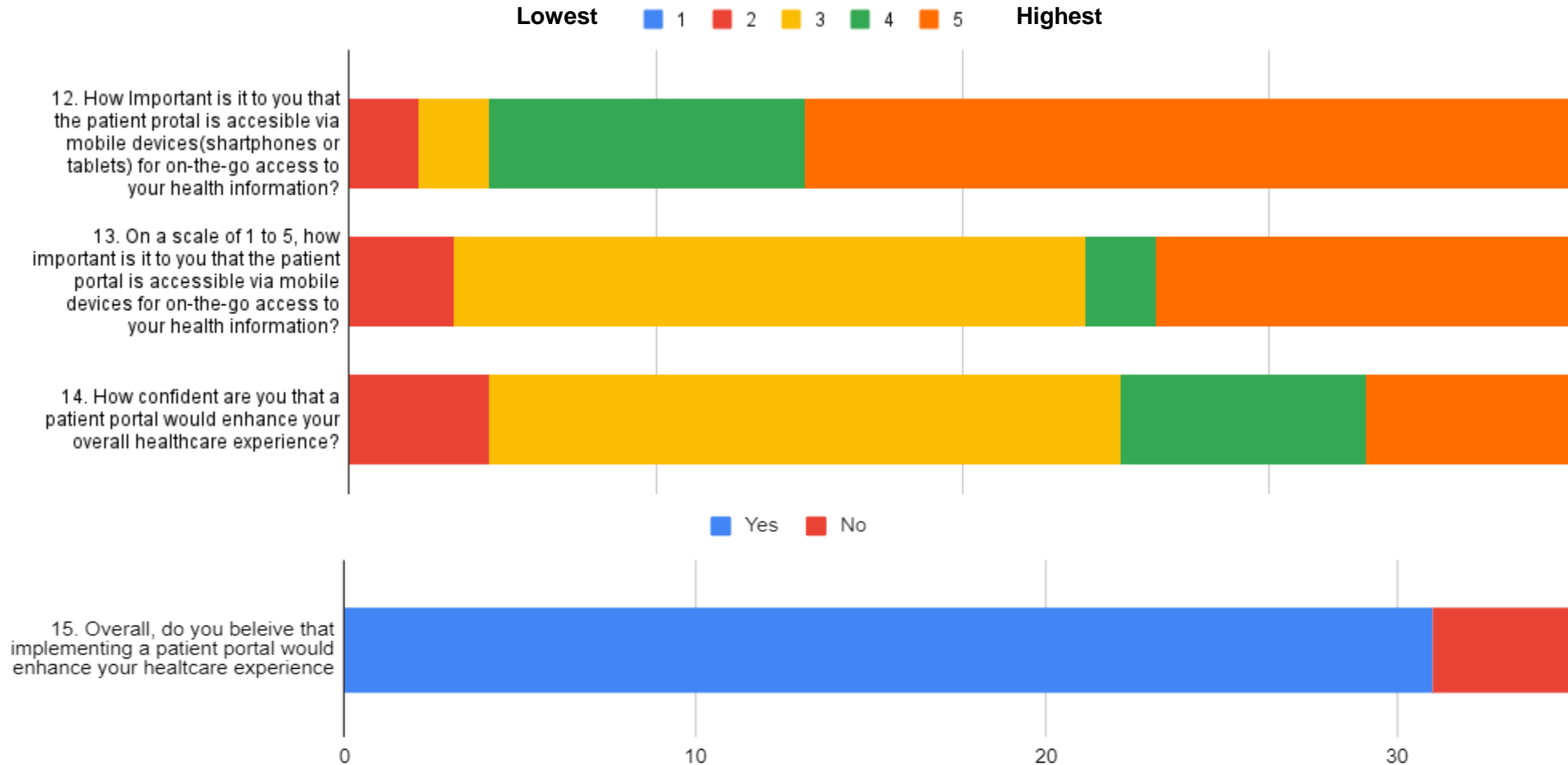| QUESTION	CLIENTS RESPONSE
1. What existing systems or tools are currently in use for managing patient information and scheduling, if any?	Yes, but the system has never been used.
2. What specific challenges or problems are you currently facing due to the absence of a Patient Information and Scheduling System?	Difficulty of managing files and documents for managing patients due to the absence of Patient Information System.
3. What is your primary goal in implementing a PIS?	To store and manage clinic documents for managing patients due to the absence of Patient Information System
4. What are your preferences regarding the accessibility and usability of the PIS for your staff and patients?	To easily access quick retrieval of patients documents
5. What specific features or functionalities do you envision for the PIS to meet your needs?	Medical Record Keeping, Appointment Scheduling, Billing, E-Receipt, E-Prescription
6. What kind of patient information do you need to store and manage within the system?	The system would store patient medical history
7. What are the platforms should the system be compatible for easy access?	Personal Computer
8. What are the key challenges or pain points you hope this system will address	The system should address challenges in managing and storing patient documents and providing easy access to patient information.

SURVEY RESPONSE
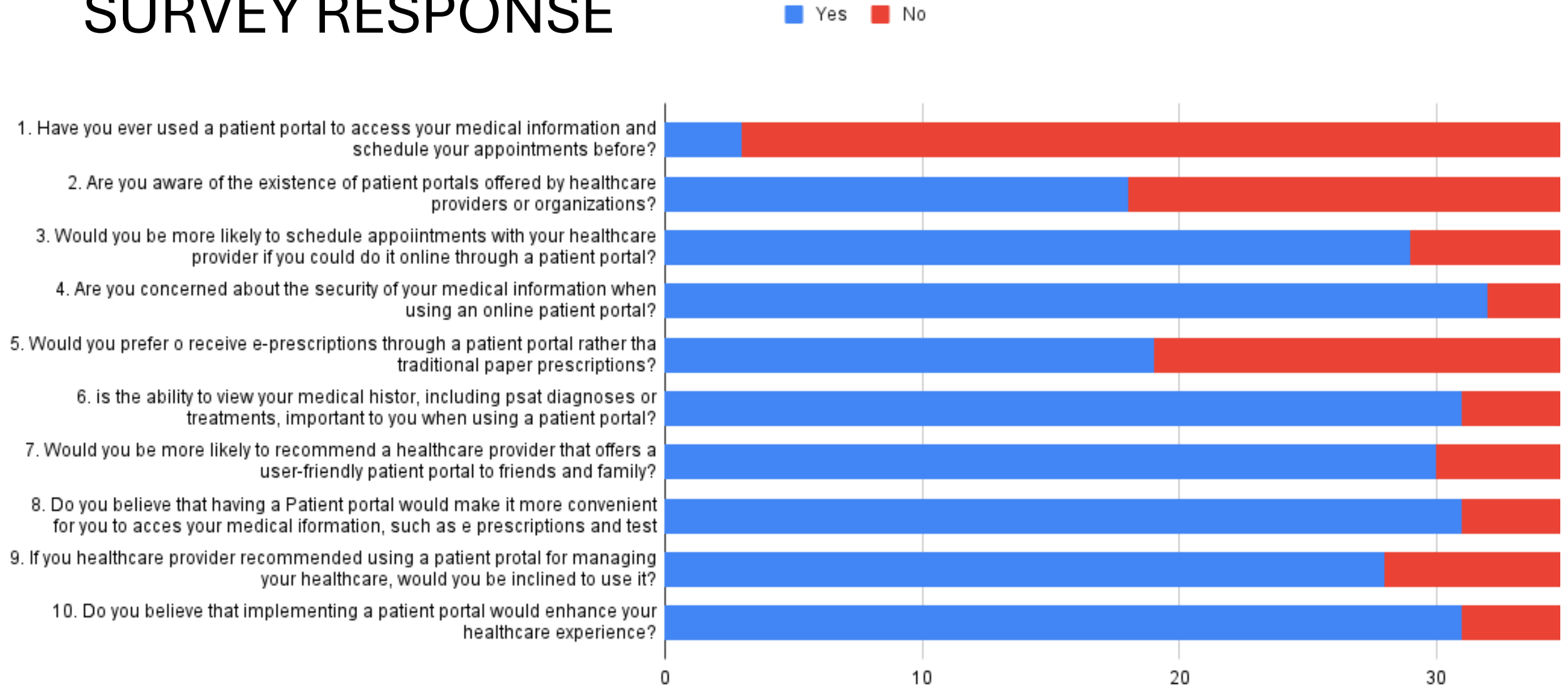
SURVEY RESPONSE

11. What specific features or functionalities would you expect from a patient portal to meet your healthcare needs better?
- Here are some of the common functionalities requested: Medical Record Keeping, E-prescription, Appointment Scheduling, and Doctor Profile

Lowest ■ 1 ■ 2 ■ 3 ■ 4 ■ 5 **Highest**

Chart 1: Stacked bar chart for questions 12, 13, and 14 (scale 1 to 5):
- 12. How Important is it to you that the patient protal is accesible via mobile devices(shartphones or tablets) for on-the-go access to your health information?
- 13. On a scale of 1 to 5, how important is it to you that the patient portal is accessible via mobile devices for on-the-go access to your health information?
- 14. How confident are you that a patient portal would enhance your overall healthcare experience?

■ Yes ■ No

Chart 2: 15. Overall, do you beleive that implementing a patient portal would enhance your healtcare experience

ASSUMPTION AND CLAIM VALIDATION
INTERVIEW

ASSUMPTION	CLAIMS	CONCLUSION
The client's current system is missing crucial functionality.	A system is required to enhance operations.	The client acknowledged the need for a more functional solution.
The client faces difficulties in daily operations.	Implementing a new system is vital to overcome challenges.	Difficulties in storing patient documents and records due to the absence of a PIS were identified.
The client has a clear vision for a new system.	The main goal is process optimization.	The client outlined primary objectives for implementing a PIS, emphasizing document management and appointment scheduling.
The client has specific requirements for usability.	User-friendliness is crucial for staff and patients.	The client stressed the importance of easy access and quick retrieval of patient documents, confirming the need for usability.
The client has unique features in mind.	Specific features are necessary to meet requirements.	The client envisions specific features, including medical record keeping, appointment scheduling, billing, e-receipt, e-prescription, and potential additional functionalities.
The client manages diverse patient information.	The system must handle varied patient data.	The client emphasized the importance of storing patient medical history, confirming diverse patient information management.
The client desires compatibility with chosen platforms.	Compatibility with chosen platforms is a priority.	The client prefers compatibility with PCs for easy access.
The client seeks a remedy for organizational issues.	Implementation is expected to resolve organizational issues.	The client's primary challenge is efficient management and storage of patient documents and providing easy access to patient information.

ASSUMPTION AND CLAIM VALIDATION
SURVEY

Questions	Assumption	Claims	Conclusion (Based on Questionnaires)	
			YES	NO
1	Users have experience with patient portals	Users have used patient portals	3/35	32/35
2	Users are aware of patient portals	Most users are aware of patient portals	18/35	17/35
3	Users would be more likely to schedule appointments online	Users will be more likely to schedule their appointments online as it is more convenient	29/35	6/35
4	Users have security concerts through patient portal	Users will have security concerns with patient portal	32/35	3/35
5	People would prefer to receive e-prescription through patient portal	Users will prefer to receive e-prescriptions through patients portal as it is more convenient.	19/35	16/35
6	People would prefer viewing their medical history including past diagnoses through patient portal	Users will prefer viewing their medical history through the patient portal	31/35	4/35
7	Users would recommend healthcare provider that offers patients portal	Users will recommend healthcare provider that has patient portal because of the convenience it gives.	30/35	5/35
8	Users find it convenient to have patient portal.	Most users find it really convenient to use patient portal.	31/35	4/35
9	Users would use the patient portal if it is recommended by the health care provider	Users will use the patient portal if it was recommended by their healthcare provider.	28/35	7/35
10	Users believe that implementing a Patient Portal would enhance your healthcare experience	Patient portal can enhance healthcare experience for its users.	31/35	4/35
15	Patient Information System enhances healthcare experience.	Users will find it useful to use patient portal as it enhances their experience.	31/35	4/35

1 – Not Important, 2 – Slightly Important, 3 – Moderately Important, 4 – Important, 5 – Very Important			1	2	3	4	5
12	Users find it important having access to a patient portal	Accessing Patient Portal through mobile application is very important	0	2	12	9	22
13	Users would find it important that patient portal is accessible via mobile devices	Patient Portal is very important as it improves users experience	0	3	18	2	16
14	Patient Portal can improve overall healthcare experience.	Patient portal is very important as it improves healthcare experience of the users.	0	4	18	7	6
11	Users would have specific features they expect from the patient portal	Users have some expected features in patient portal	Users expect Medical Record Keeping, E-prescription, Appointment Scheduling, and Doctor Profile				

DOCUMENTATION
INTERVIEW WITH THE CLIENT

Figure 1. A letter of Permission to conduct interview was obtained by the client.

Figure 2. A screenshot from the video clip during the interview with the client.
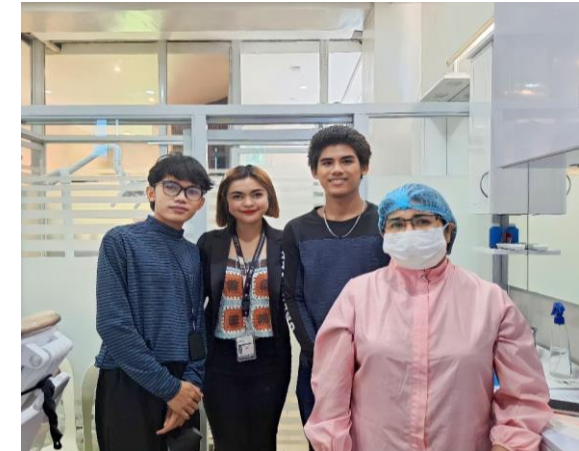
Figure 3. A photo after the interview

DOCUMENTATION
SURVEY

Figure 4, 5, 6. Images conducting survey

CONCLUSION

The research study "DentaWeb: Patient Information and Scheduling System" concludes by highlighting the critical role that cutting-edge healthcare systems play in improving patient care and operational effectiveness. It emphasizes the need of user-centric design, ethics integration, and solving healthcare concerns while highlighting significant knowledge gaps. The mixed-methods research technique utilized in this study emphasizes the importance of more user-friendly, diverse patient data management, and functional patient information systems. The results of the survey show that patients are aware of and prefer patient portals, which include e-prescriptions, online appointment scheduling, and simple access to medical records. Users find patient portals easy and like healthcare organizations that offer them. The study's overall conclusion highlights the ongoing need for research and development to enhance patient care and healthcare effectiveness.