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The Development of a Web Portal for an Assisted Reproduction Center in South India and an Analysis of its Efficacy

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ABSTRACT

Introduction: Telemedicine is the need of the hour to keep pace with developments in the healthcare industry. Easy and better access to facilities facilitates customer retention. Online consultations facilitate hassle free patient–doctor communication, in sharp contrast with the common sight of long waiting queues for doctors. Objective: To develop and analyse the efficacy of a web portal for an assisted reproduction center at a tertiary care hospital in South India.

Method: This study was conducted between November 2017 and April 2018. An initial study was conducted to analyse the need for online consultations at this center. Based on this study and considering the future requirements of e consultation in Kasturba hospital, a web portal was developed. Upon the completion and implementation of the web portal, patients who registered for the web portal services were administered a feedback questionnaire on the efficacy of the web portal. This questionnaire had to be filled out by the patients when they logged out of their web portal account. The questionnaire responses were analysed to assess the acceptance level of patients to online consultation and the working efficiency of the web portal.

Results: Patients who registered with the web portal found it user friendly. They found it easy to access all information on the portal. The positive feedback and suggestions from patients suggest that the patient portal was wilfully accepted by them.

Keywords: *Telemedicine, Online consultation, E-health, E-consultation, patient portal, web portal.*

INTRODUCTION

Telemedicine is the need of the hour to keep pace with developments in the healthcare industry. Easy and better access to facilities facilitates customer retention. Online consultations facilitate hassle free patient–doctor communication, in sharp contrast with the common sight of long waiting queues for doctors. In an era of consumer driven healthcare, where patients browse healthcare information on the Internet, graphically appealing, informative and patient centred websites can attract their attention.[1]

Patients seek better communication with their physicians. A fully functional website with patient portal solutions will not only facilitate enhanced patient-to-provider relationships but also enable hassle free patient- physician communication.[1] The patient portal is a secure, interactive, web based communication solution that provides a platform for online interaction between doctors and patients. The availability of a patient portal can influence the patient's choice of healthcare provider.[1]

A recent trend in eHealth is delivering health care services online. Online health services like E-consultations have become increasingly popular.

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These online health services can reduce both waiting time and travel expenditure. Online consultations can improve the operational efficiency and effectiveness of and equitable access to medical resources. They can reduce medical costs and improve customer satisfaction.[2] With increasing awareness and newer technology, the demand for assisted reproduction services is growing. The IVF market in India is growing at a Compounded Annual Growth Rate(CAGR) of 28% and is expected to be a Rs.500 crore market in India by 2022.[3] With growing internet penetration, internet users in India are expected to increase at a CAGR of 15.6 per cent from 450 million at the end of 2017 to 700 million by 2020.[4]

OBJECTIVES

1. To develop a patient friendly web portal for an Assisted Reproduction Center(ARC).

2.To assess the efficacy of the web portal.

METHODOLOGY

This study was conducted in an Assisted Reproduction Center (ARC) at a tertiary care hospital in South India between November 2017 and April 2018. An initial assessment was done of the requirement of online consultation in this department. The number of email exchanges between doctors and patients was counted. The need for features like report uploads and appointment scheduling was assessed. It was seen that 30-40 email exchanges per month were happening between doctors and patients. No consultation fee was being charged for the e mail consultations. There were several instances of overseas patients wanting to consult a doctor in the assisted reproduction center but not being able to do so because of the lack of a patient portal for online consultations. In order to cater to all these requirements, a patient portal with the following features was developed for the assisted reproduction center.

1. Patient Registration:

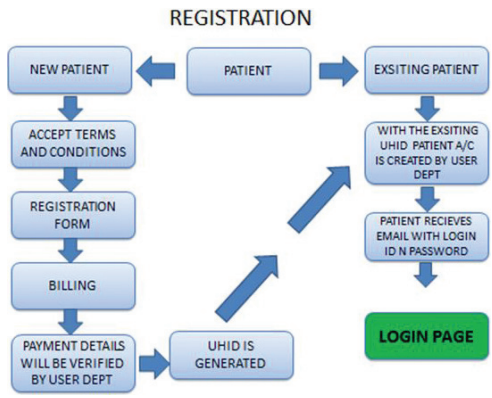

Figure 1: Registration process for a new patient

2. User Interphase: The portal has 3 kinds of users: Patients, doctors and administrators. Each one will have access to a different view. 3 different views were created:

a. Patient view (Figure 2) : This is accessible only to patients. It has the following features : Option to get an online consultation through message; Option for the patient to upload his reports to get the doctors' opinion; Option to view the date and time of the scheduled appointment. Every patient who needs an online consultation with a doctor is directed to the payment gateway for payment of the consultation fee. The patient can contact the doctor only after the payment is completed. Every message sent by the patient to the doctor is considered a consultation and is charged. The patient can upload her reports on the portal. The file size limit for each file is 5 MB. The acceptable file types are pdf and jpeg.

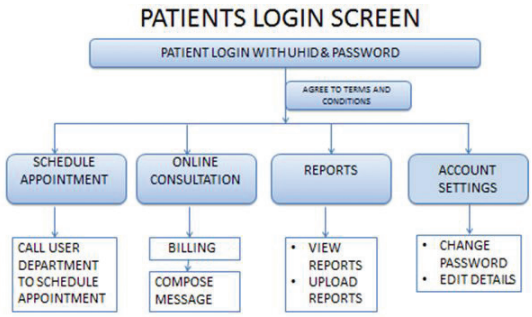

Figure 2: User interphase : Patient view

b. Doctors' view (Figure 3): This view is accessible only to doctors. It has the following features: IVF module; Exchange of messages with patients; Viewing of reports uploaded by patients; Appointment list of patients with date and time. The IVF module contains details of patients who are undergoing treatment at the ARC. This can be accessed only through a password which is unique for each doctor.

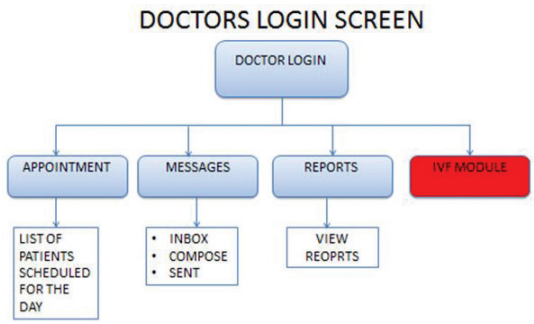

Figure 3: User interphase : Doctors' view

c. Administrators' view (Figure 4): This is accessible only to the front office staff. It has the following features: The registration of patients for accessing the patient portal. Every patient can be registered only through a valid email ID and valid Hospital number given to the patient at the time of registration; Scheduling of appointments; The message exchanges between the patient and the doctor.

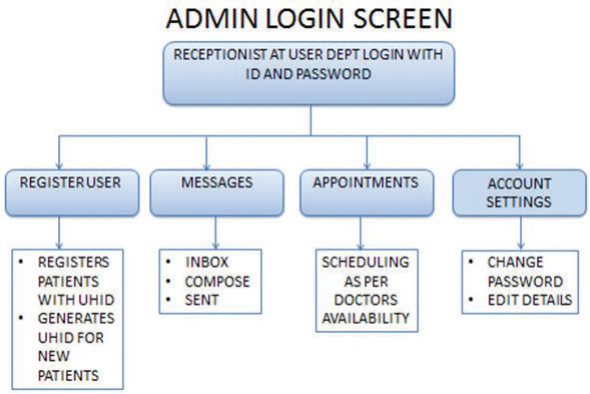

Figure 4: User interphase: Administrators' view

Assessment of the efficacy of the web portal: The web portal efficacy assessment was done by analysing the patient feedback, which was taken from patients with the help of a structured questionnaire. A sample size of 10 was considered for the analysis. Every patient who was registered in the portal had to give feed back at the time of logging out. The structured questionnaire consisted of 10 questions, out of which 8 were multiple choice questions and the remaining 2 questions were open ended, where the respondents had to fill in their comments.

RESULTS

Question 1: How easy was the login process ?

The answer options were Very Easy, Easy, Neither easy nor difficult, Difficult and Very difficult. 2(20%) respondents answered Easy. 8(80%) respondents answered Very Easy.

Question 2: Were you able to view all information after logging in successfully?

The answer options were "Yes" and "No". All 10 respondents were able to view all information after logging in.

Question 3: Did you find any issues in sending or viewing messages ?

The answer options were "Yes" and "No". All 10 respondents had no problems in sending or viewing messages.

Question 4: Was it easy to upload a report? The answer options were "Yes", "No" and Not Applicable. Of the 10 respondents, 5(50%) who actually uploaded a report found it easy to do so. The remaining 50% did not upload any reports.

Question 5: Were you able to update your password easily ?

The answer options were "Yes", "No" and Not Applicable. All 10 respondents were able to update their passwords easily.

Question 6: How would you rate the web portal?

The answer options were "Excellent", "Good", "Average", "Bad" and "Very bad". Of the 10 respondents, 6(60%) rated the web portal Excellent whereas 4(40%) rated it Good.

Question 7: Overall, how well does our website meet your need?

The answer options were "Extremely well", "Very well", "Somewhat", "Not so well", "Not well at all". Of the 10 respondents, 5(50%) responded that the website met their need extremely well, while 5(50%) responded that the website met their need very well.

Question 8: How easy is it navigate our web portal ?

The answer options were "Extremely easy", "Very easy", "Somewhat easy", "Not so easy" and "Not easy at all". Of the 10 respondents, 6(60%) responded that the web portal was extremely easy to navigate. The remaining 4(40%) responded that the web portal was very easy to navigate.

DISCUSSION

cherpbier-de Haan et al in an initial implementation of a web based consultation process for patients with chronic kidney disease observed that In the absence of telenephrology, 43 patients (35.3%) would have been referred by their family physicians, whereas the nephrologist considered referral necessary in only 17 patients (13.9%) (P <.001). The family physician would have treated 79 patients in primary care. The nephrologist

deemed referral necessary for 10 of these patients. Time investment per consultation amounted to less than 10 minutes.[5] Edwards et al in the evaluation of a pilot observational study on the use of a primary care online consultation system in 36 general practices in South West England observed that the use of e-consultations was very low, particularly on weekends. Unless this can be improved, any impact on staff workload and patient waiting times is likely to be negligible. It is possible that use of e-consultations increases primary care workload and costs. Online consultation systems could be developed to improve efficiency both for staff and patients. These findings have implications for software developers as well as primary care services and policy-makers who are considering investing in online consultation systems.[6]

Biermann et al in their study on using the internet to enhance physician-patient communication, observed that the rise in internet use by patients with musculoskeletal problems has put orthopaedic surgeons under increased pressure to provide Web-based resources. Patients are researching musculoskeletal conditions online, and many want to communicate electronically with their physicians. Online medical information may be a useful adjunct to traditional physician-patient interaction because it is readily available, is wide in scope, and can provide the patient with basic knowledge on a given topic. A clinical encounter may then be efficiently spent refining information and answering specific questions. Orthopaedic surgeons should be aware of the advantages of using Internet resources as part of their practice as well as the potential legal and confidentiality pitfalls in electronic communication. Some patient concerns may be easily satisfied and communication enhanced through the use of e-mail. Physicians planning to incorporate electronic communication with their patients must be prepared to manage unsolicited e-mail, maintain patient confidentiality, and adopt practices that maximize the use of online resources to enhance patient education.[7]

Hjelm et al, while wiring a medical school and teaching hospital for telemedicine, observed that little attention has been paid to the use of audio-visual communication within a smaller setting such as a hospital. They demonstrated that there are many applications of audio-visual communication in such an environment. They state that Audio-visual communication between patients and health professionals, and between health professionals themselves, should improve the quality of health and of undergraduate and postgraduate teaching to all categories of health professionals. They observed that the costs for a hospital-based audio-visual LAN are surprisingly low compared with overall costs for patient care. Therefore, they concluded that telemedicine in a hospital environment could well be the main application of this form of information technology in the longer term.[8] Baldwin et al in their study on the pitfalls, promises and learnings from patient portals and health apps observe that the widespread use of health information technology (IT) could potentially increase patients' access to their health information and facilitate future goals of advancing patient-centered care. Despite having increased access to their health data, patients do not always understand this information or its implications, and digital health data can be difficult to navigate when displayed in a small-format, complex interface. The authors discuss two forms of patient-facing health IT tools—patient portals and applications (apps)—and highlight how, despite several limitations of each, combining high-yield features of mobile health (mHealth) apps with portals could increase patient engagement and self-management and be more effective than either of them alone. Patient portal adoption is variable, and due to design and interface limitations and health literacy issues, many people find the portal difficult to use. Conversely, apps have experienced rapid adoption and traditionally have more consumer-friendly features with easy log-in access, real-time tracking, and simplified data display. These features make the applications more intuitive and easy-to-use than patient portals. While apps have their own limitations and might serve different purposes, patient portals could adopt some high-yield features and functions of apps that lead to engagement success with patients. The authors thus suggest that to improve user experience with future portals, developers could look towards mHealth apps in design, function, and user interface. Adding new features to portals may improve their use and empower patients to track their overall health and disease states. The authors conclude by saying that both these health IT tools should be subjected to rigorous evaluation to ensure they meet their potential in improving patient outcomes.[9]

CONCLUSION

The ARC patient portal was wilfully accepted by patients, as evidenced by the positive feedback and suggestions given by them. This could be considered a stepping stone for the acceptance of E-health and for the

further adoption of a patient portal in the departments of the hospital based on the hospital requirements.

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