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Improving the quality of care and operational efficiency of Indian hospitals through mobile personal health records- A detailed study of VYTAL mobile app

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ABSTRACT

Healthcare spending in India is witnessing a rapid growth of 12%, estimated to reach $195.7 billion by the year 2018. Indian families are becoming aware and not shying away from spending on quality care for their loved ones. Some of the contributing factors of these trends have been rising incomes, lifestyle diseases and increasing access to insurance. To meet the consumer demands, healthcare providers are also gearing up to standardize the quality of service delivery, control cost and enhance patient engagement. Strong mobile technology infrastructure and notable technology initiatives have helped in fuelling this trend. This paper studies one such important initiative that holds great promise in improving the quality of care and reducing costs i.e. digitization of health records through mobile apps that easily connect families with the healthcare ecosystem. The findings in this paper are based on our study of Vytal Healthtech applications, various surveys conducted with clinical and administrative heads of leading Indian Hospitals and interview with medical specialists. This paper discusses the applicability and benefits of such technologies and highlights the right features that address the requirements of Indian healthcare providers, patient communities and Indian urban families. The findings can be of tremendous use to progressive Indian healthcare providers and policy makers.

Keywords— *Medical records, Indian hospitals, Healthcare, Indian hospitals*

1. INTRODUCTION

It was observed that healthcare providers are building adoption of such technologies into their strategy for an integrated and coordinated care experience to their IPD and OPD patients. The factors governing the successful adoption of these technologies include; strong leadership, full involvement of medical experts in design and implementation, effective training and adherence to budget. The vytal app helps hospitals and doctors engage better with their patients even beyond the tenure of treatment, facilitates patient safety and quality improvement through checklists, alerts, effective communication; embedded clinical guidelines and easy access to health history and diagnostic reports avoiding medical errors and redundancy. Digitization of valuable data, otherwise trapped in paper records, helps gain greater insights about patient's health, spend and medical practice in general. Faster, more accurate communication and streamlined processes lead to brand loyalty, increased patient satisfaction, fewer errors, fewer duplicate tests hence reduced costs and better utilization of hospital resources and faster responses to patient inquiries.

2. OBJECTIVES

The objective of this paper is to verify and validate the key constructs and benefits of using electronic medical records such as improved efficiency and quality of healthcare, reduced medical errors, cost- saving, financial transparency and improved patient safety, engagement and satisfaction.

3. METHODOLOGY

3.1 Type of research

The type of research that was used in this study is qualitative research and quantitative research. Qualitative researchers aim to gather an in-depth understanding of "why" and "how" of decision making. Besides this, the researcher also examined the phenomenon through observations in numerical representations and through statistical analysis. Semi-structured interviews with the respondents were conducted.

3.2 Sampling method

The research sampling method that was used in this study is random sampling to obtain a more scientific result that could be used to represent the entirety of the population. A list of key health care facilities (consultant clinics and hospitals) in Mumbai was acquired.

3.3 Respondents

The respondents in this research were hospital administrative, clinical and medical specialists. There were 23 respondents across 15 hospitals in Mumbai and Mumbai suburbs.

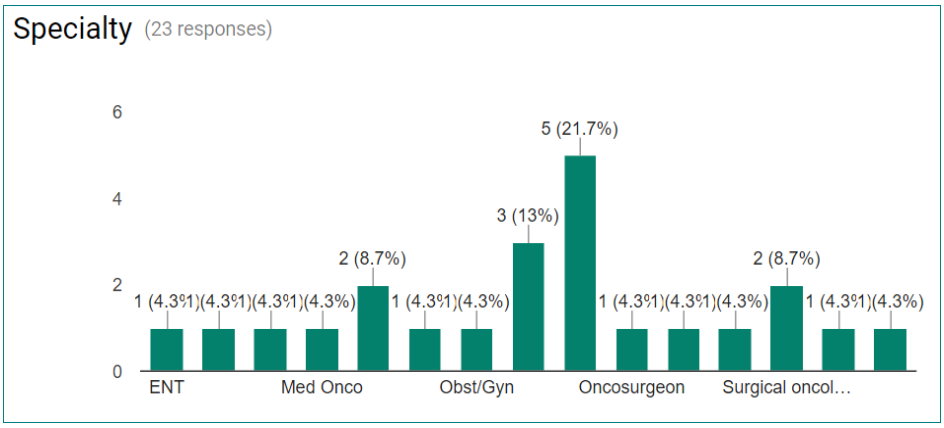

Fig. 1: Respondents

3.4 Questionnaire

The questionnaire starts with basic information gathering about doctor's practice and background. Further, the questionnaire requires information about use and effect of computer technologies in the hospitals, and gathers their inputs on whether the benefits (such as, improved care, increased workflow efficiency, minimal medical errors, improved patient engagement and satisfaction, financial transparency etc.) would be achievable with use of electronic medical record and patient records solution.

3.5 Sample size

Altogether 23 doctors including the assisting staff to doctors and allied departments were taken under the scope of the study. Purposive sampling technique was used to collect the information.

4. FINDINGS

The research suggested few major perceived inhibitors in the adoption of such tools or technologies before the studied technology solutions were provided to them, which are listed below.

- None of the physicians is using the digitized records in their capacity of practice
- About 18.2% did not understand to use the technology
- About 86% considered data entry difficult and time-consuming
- About 22.7% perceived the use of such tools and technology to be high cost, however, they are willing to consider them in a subscription model
- About 4.5% do not have any training in such tools and technology
- Concerns about not customized as per their speciality constitute 40.9%.

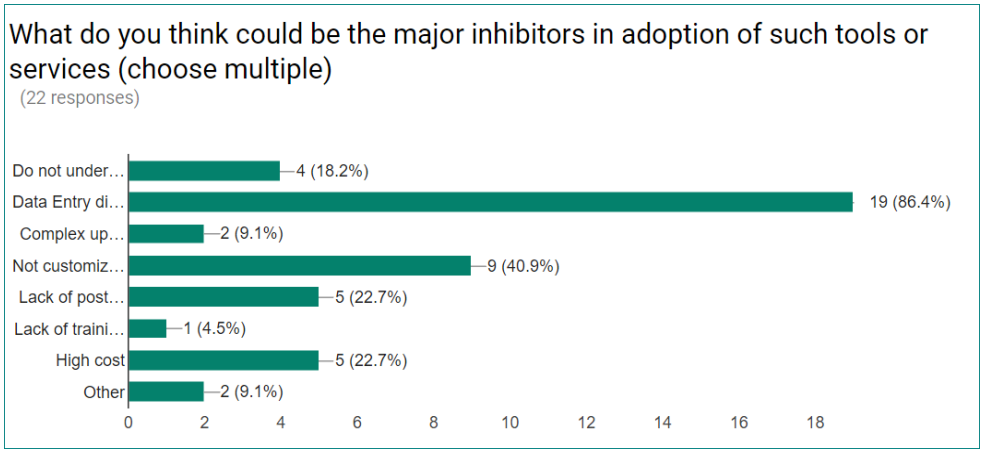

Fig. 2: Major perceived inhibitors in the adoption of such tools

- In terms of willingness to pay for technology, about 31.8% were found to be willing to pay less than Rs.5000 in annual fees; about 18.2% were found to be willing to pay in the range Rs.5000-8000 in annual fees; about 27.3% were found to be willing to pay in the range Rs.8000-10,000; about 18.2% were found to be willing to pay in the range Rs.10, 000- 15000.

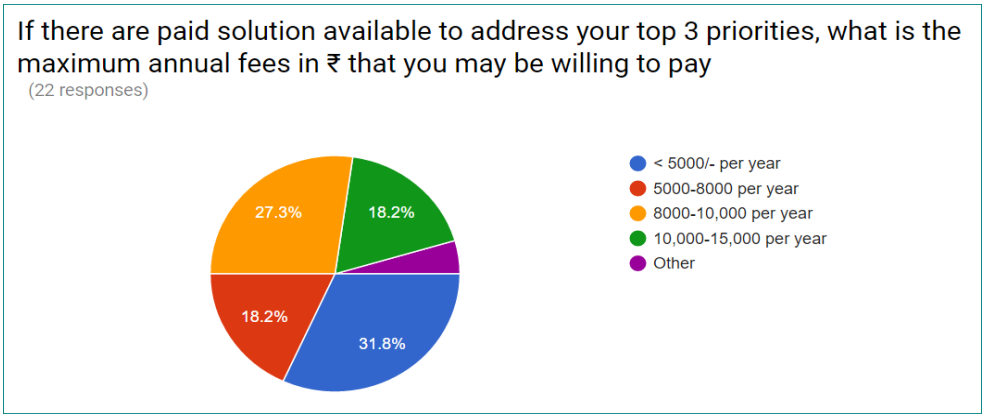

Fig. 3: Willingness to pay for technology

5. RESEARCH SUGGESTIONS

During this research, it was well understood that healthcare providers do acknowledge the role of mobile technology to attain:

- Higher engagement and build lasting relationships with patients
- Improved Patient Satisfaction and Experience
- Improved value to patients and
- Better data quality for improved insights

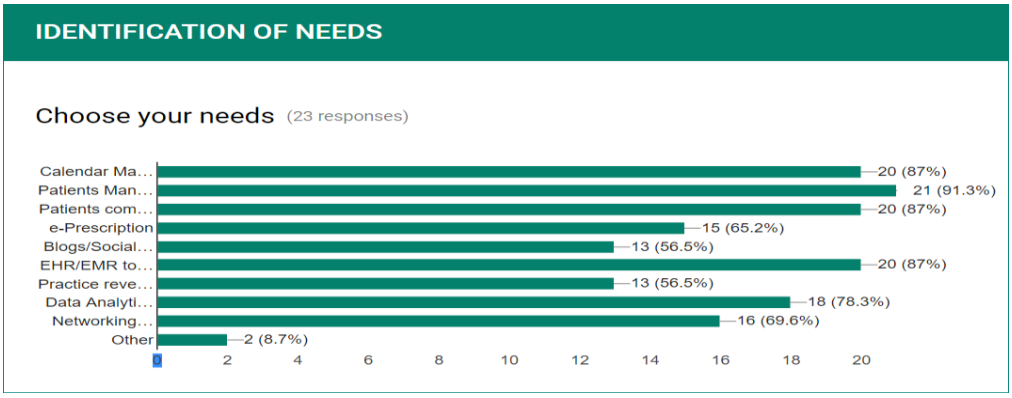

Fig. 4: Suggestions

Majority of respondents need patient engagement and medical record capture and management capabilities.

Medical records based systems are the first step towards transformed health care. The benefits span across the entire medical ecosystem including better health care by improving all aspects of patient care, safety, patient-centeredness, communication, timeliness and efficiency. Following benefits were identified during the research conducted as well as on actual usage basis of a few of the leading medical record players such as Vytal are:

5.1 Increased efficiencies in the workflow as staff time is redeployed

- Less Time Spent "Chasing Charts": When staff members have quick, easy access to patient records, they save time that would otherwise be spent locating paper charts.
- Better Information Availability: With EHRs, patient records are available simultaneously to all appropriate staff at all times, meaning your staff can more efficiently locate and process patient information.
- Improved Medical Practice Management: With easy appointment scheduling you can more efficiently run your organization and improve medical practice management.
- Less Time Spent Deciphering Handwriting: With EHRs, staff members will spend less time interpreting handwritten notes.
- Enhanced Information Sharing: Electronic sharing of data and lab reports with hospitals saving staff time that would otherwise be spent manually entering information into patient records

5.2 Improve ability to care for patients

- Improve care coordination
- Improve communication with patients
- Enhanced overall patient care
- Positive patient-physician relationships and fostered the sharing of medical information
- Make better decisions. With more comprehensive health information at your fingertips, you can make better testing, diagnostic, and treatment decisions. You can utilize drug-drug and drug-allergy interaction checks,
- Remind your patients when they need preventive care and screening

5.3 Avoid medication errors

- Generate and transmit prescriptions electronically, which means pharmacists and patients can reliably read handwriting and avoid potential errors

5.4 Engaging with patients

- Communicate with patients: With EHRs, you can manage appointment schedules electronically and exchange e-mail with patients. Quick and easy communication with your patients will enable your organization to identify symptoms earlier, proactively reach out to patients, and improve health care quality.
- Engage patients in their health and health care by providing patients with clinical summaries and educational resources
- Better share information with your patients: With EHRs, you can give patients detailed and accurate information about their health and health care. After an appointment or hospital stay, your organization can provide clinical summaries, reminders for follow-up care, or links to educational resources.
- Collect and manage the information you need to engage patients: EHRs will enable your organization to collect and manage important data about your patients. Using patient lists, your organization can identify and proactively engage at-risk patients

5.5 Improve patient satisfaction

- Reduce waiting time for office appointments and improve appointment scheduling
- Decrease unnecessary tests and immunizations, which can be costly and unsafe for patients
- Improve communication with patients and reduce turn-around time responding to billing and clinical inquiries
- Encourage your patients to take ownership of and manage their health and health care using clinical summaries and educational resources
- Provide patients with quick, easy access to their health information and give them the peace of mind their information will be secure and available to the right people in the right place at the right time

5.6 Improving Public and Population Health Outcomes

- Through immunization records, disease reporting, and electronic laboratory reporting, providers can transmit public and population health data to public health officials.
- Better your organization's ability to prevent disease. With electronic health information about the entire population of patients you serve, you can look more meaningfully at the needs of patients and offer better health care.

5.7 Financial transparency

- When patients pay online, staff members do not need to handle cash and there is complete transparency.

To keep up with the tech-savvy population, many hospitals have created or are in the process of creating mobile apps. But according to the report from tech consulting firm Accenture – while 54% of health consumers want to interact more with healthcare providers through apps on their smartphones, only 2% of patients are currently using their hospital mobile app. This important finding indicates that the solution is missing functions that consumers demand most, and then the technology adoption is bound to fail, diminishing the returns on technology investments. Health consumers' stickiness to the mobile app increases the probability of collection of relevant and analyzable data. The research, which assessed mobile app use among the 100 largest U.S. hospitals, found that two-thirds (66 per cent) of the 100 largest U.S. hospitals have mobile apps for consumers and roughly two-fifths (38 per cent) of that subset have developed proprietary apps for their patients. However, only 11 per cent of health systems offer patients proprietary apps that operate with at least one of the three functions that consumers demand most: access to medical records; the ability to book, change and cancel appointments; and the ability to request prescription refills electronically.

In India few leading hospitals either have developed a proprietary app or are in the process of designing one; however, the majority of functions are limited to informing the patients about hospital facilities or doctors schedule. Integration with hospital information system still remains a challenge due to the lack of standards in various homegrown hospital systems.

"Simply having a mobile app is not enough," said Brian Kalis, managing director in Accenture's Health practice. "Hospital apps are failing to engage patients by not aligning their functionality and user experience with what consumers expect and need. Consumers want ubiquitous access to products and services as part of their customer experience, and those who become disillusioned with a provider's mobile services – or a lack thereof – could look elsewhere for services."[1]

After studying the value-based offerings of mobile app like Vytal, that can be customized for a hospital as an effective patient engagement tool, following benefits have been identified that can help increased adoption and stickiness to the solutions

Practising physicians and hospitals may consider some of the suggestions outlined below:

a) Ready to use and complete with hospital/doctor branding

A solution like Vytal designed for the entire life for each family member and serving their purpose even beyond the treatment duration is more likely to get more stickiness. Hence the hospital can have a patient connect beyond the specific duration of treatment.

b) Help health consumers get information about hospital facilities beyond their current medical need

A patient seeking treatment for one medical condition for eg Cataract may also be in need of cardiology or orthopaedic specialty for himself or any other family member. By using any other app for appointment or search he can get static information like OPD schedule or doctor listing etc. Using Vytal he can get real time information on a regular basis about hospital facilities, new tests or treatment facilities made available or some time-bound schemes like health checks for eg discounts for heart-related investigations on the occasion of world heart day. Any such marketing initiatives can directly reach the patients who are hospital registered patients using Vytal and also non-hospital-Vytal-users who are using the general app.

c) Two-way communication channel

Using the solution as a communication channel will increase the adoption and stickiness. For example, Vytal app offers

- **Notifications:** for IPD and OPD patients about
  - appointment schedule and charges
  - marketing initiatives as per patient segment

- **Patient-specific communication :**
  - **Admission details** – bed number, class of admission etc.
  - **Intimation of admission** – when a patient wants a specific class for admission and if no beds in that particular class are available the patient is either admitted in other class or is kept on the waiting list. This is one of the areas for patient dissatisfaction. The patient can be made aware of hospital bed occupancy and her status on the waiting list through the message.
  - **Treatment-related updates** – Admitted patients seek various types of information through the ward sisters which is not readily available or many times the sisters are not able to communicate with the patients or their relatives effectively which leads to patient dissatisfaction. Updates like the status of investigation report or medication or doctor visit schedule can be communicated through this. The patient also can respond through the same function which can be answered by a specific person assigned for that task.
  - **Discharge and Billing** – Another area for patient complaint most of the times due to delay in billing or bill going above the estimated amount (a common scenario in a corporate setup or in a complicated case).

The patient can be updated about her bill on a daily basis through Vytal app. Currently, hospitals have a policy of updating the patients about their dues verbally. In some cases, if the bill overshoots the estimated amount the patients complain at the time of final billing. By using vytal they can be made aware of their bills and any overshoots. The hospitals can have a record of all the patient communications and it can be produced as evidence – to the patient or even to the COURT if a medico legal case is filed by the patient in future.

The patients also can be updated about the status of discharge process eg: discharge ready or discharge pending billing or clearance from insurance etc.

- **Follow up reminders:** for OPD and IPD patients

d) Access to medical records

Since the majority of doctors and hospitals in India still use paper for capturing clinical data and writing prescriptions and findings, the solution should have the ability to capture data from paper-based system. In Vytal, all OPD and IPD patients can access scanned images of their records at any time which can be shown to the doctors. The records could be from the hospital consultant or outside the hospital. Patients can also avail digitization through transcription portal – a paid service.
The hospital can also avail transcription services – for all records or for some specific speciality or a specific purpose.

e) Connecting with larger health ecosystem

Connecting patient with hospital services not only helps the patient get easy access to the ecosystem but also gives increased revenue opportunity to the hospital. Hospital pharmacy is the patient's obvious choice at the time of their consultation, but any subsequent purchase of medicines generally happens outside the hospital amounting to a loss of a customer for hospital pharmacy. This can be tackled by connecting "ORDER REFILL" feature to the hospital pharmacy.

f) Insight into the patient's behavior and clinical data [2]

Structured data can better reporting capabilities. Through surveillance data submission, immunization registries, and electronic laboratory reporting, providers can transmit public and population health data to public health officials. With more and better data available, public health organizations can better monitor, prevent, and manage the disease. Tools like Vytal can also help generate reports about anonymized patients' preferences or behavior outside the hospital using analytical tools.

Physicians planning to implement health record-based technology solutions may wish to consider data entry issues from the outset. Therefore a backend and outsourced transcription service, as established by Vytal, can be helpful in ensuing capturing of complete and correct data. Assistance from the technology vendor and from experienced colleagues may be of value. Issues to consider may include:

- Consistency of data entry (coding when appropriate, entering data inconsistent areas, workflows related to data entry for scanned documents);
- Completeness of data entry (medications, avoiding non-electronic external sources if an electronic source is available); and
- Accuracy of data entry.

Practising physicians may wish to consider some of the suggestions outlined earlier. Systematically informing and redirecting patients away from non-electronic external data providers such as non-electronic labs may be possible. Scheduling regular, ongoing training as well as training in ancillary IT skill such as keyboarding (if needed) may be of value. Several of these suggestions have costs in terms of money or time; physicians could periodically review the costs and benefits of various interventions. In this study, a group of physicians used collective resources to manage preventive services and this was associated with the implementation of reminder letters to patients who were overdue. Physicians may consider associating with colleagues in order to leverage group resources for selected technology solutions implementation activities.

6. CONCLUSIONS

Physicians and hospitals generally felt that to keep up with the tech-savvy health consumers, enhance the efficiency of their practice and operations and enhance the utilization of their revenue-generating services, a mobile app with functions that can

engage a patient and its family can ensure higher adoption and stickiness. In a subscription-based model and continuous technical support from the vendor, Physicians and hospitals can minimize the difficulties with adapting the system to their practices and reinventing their workflows to take advantages of such innovative and beneficial solutions during implementation.

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