

Growing Importance of Patient Engagement in Healthcare

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Abstract - *It's a common phrase in the healthcare industry to say, "Patient engagement and adherence has long been seen as the 'last mile problem of healthcare'".*

Patient engagement involves reaching out to patients via various communication mediums to help improve health outcomes, drive better patient care, and achieve lower costs. This article outlines the need for deeper patient engagement, how facilities can achieve it, and what are the benefits of such patient engagement. It is quite a common conclusion in the industry that Patients who are engaged in their care tend to be healthier

Patient engagement stresses the need for patients to play an important role in their well-being. This includes reading, understanding, and acting on health information (health literacy), working closely together with a care provider from the start to opt for appropriate treatments or deliberate options (collaborative decision making), and providing feedback on the care processes and outcomes.

Effective provider & patient engagement is bi-directional and focuses on collaboration with the patient. It involves a holistic approach using patient health data from social determinants, health literacy, access to care, etc.

Keywords - *Artificial Intelligence, Patient Experience, Healthcare, Health-tech, Patient engagement*

I. INTRODUCTION

Over the past years, the concept of "Patient Engagement" has risen to prominence across the healthcare industry. Improving the health of a country requires improving the health of each individual. Patient engagement is highly predictive of both quality outcomes and health systems costs. Summing up, it is very crucial how engaged a person is in managing his/her health to understand & to progress towards the goal of improving overall population health.

With evolving technologies such as cloud computing, blockchain multiple use-cases have opened up new avenues for improving standards in the health care sector. This

document specifically works around improvement in Patient engagement.

Although there is no widely accepted definition of patient engagement, the concept is that patients are actively involved in their health—in terms of processing information, deciding how care fits in their lives, and acting on those decisions. Engaged patients strive to be informed about their health, are involved in health care decisions, and participate in self-care. They assume responsibility and accountability for the role their behaviors play in their care outcomes. [1]

Engaging patients in their healthcare is a growing trend. The Institute of Medicine (IOM) has recommended that individuals receive opportunities to access appropriate medical information and clinical knowledge, enabling them to be the 'source of control' in making healthcare decisions. By increasing patient participation, it is believed that patients can experience higher satisfaction and better health outcomes. A recent issue of *Health Affairs* dedicated to patient engagement referred to the phenomenon as equivalent to the next 'blockbuster drug'. [2]

One area in which patient engagement has been historically limited is within the hospital. For many patients, hospitals are unfamiliar, isolating places filled with anxiety and unanswered questions. Being a hospital patient has been called 'one of the most disempowering situations one can experience in modern society. In a survey of hospital patients conducted by Tumbler *et al.*, 90% of respondents said they wanted to review their hospital medication list for accuracy, but only 28% were given the opportunity to do so. [2]

As healthcare providers continue to focus on driving deeper patient engagement, it's changing the way chief information officers are prioritizing their needs. No longer CIO's can afford to deploy solution which addresses the basic needs of the hospital function but rather starts focusing on holistic improvement by implementing software applications which can focus on Patient, Patient care & Patient satisfaction, all of which by the way impacts the performance and success of the providers.



Positive patient engagement needs to go beyond just normal/typical patient-provider interactions and amenable facilities, although those factors are still important.

Creating a positive environment that drives patient engagement towards better health is a vital cog in the entire spectrum of the healthcare ecosystem.

The goal of comparative effectiveness research (CER) is to provide patients, their advocates and caregivers, health care professionals, federal officials, policymakers, and payers with evidence-based information to make informed health care decisions. Previously, CER studies were designed by researchers and had relatively little input from patients. Patient engagement has rapidly gained acceptance as crucial to the successful translation of CER for all interested parties. [3]

II. IMPORTANCE OF PATIENT ENGAGEMENT

Targeted/contextual outreach and engagement can have a profound impact on the quality of patient's health, health outcomes, informed decision-making ability, cost considering & finally, patient satisfaction.

While “patient engagement” is a popular theme in today’s healthcare industry, only a few of the healthcare organizations have been able to implement some form or other of effective patient engagement programs.

The primary outcome was patients' ratings of their overall satisfaction with hospital care, and the primary independent variable was patients' ratings of their physicians' communication behaviors. To remove possible confounding of the association between patient ratings of physician communication and overall satisfaction by other patient-specific attributes, we created an instrumental variable (IV) in a two-stage linear regression. The IV was the mean of the communication ratings given to each physician by the other patients cared for by that physician. **PRINCIPLE FINDINGS/CONCLUSIONS:** Three thousand one hundred and twenty-three patients were included in the analysis. In the ordinary least squares regression, there was a significant positive relationship between overall satisfaction and overall ratings of attendings' communication behaviors, with an increase in the overall satisfaction of 0.58 points on a 5-point scale for each 1-point increase in overall attendings' communication behaviors, p<.001. This relationship was maintained but attenuated in the IV regression, with a coefficient of 0.40, p=.046. Although we find that the relationship between patient communication ratings and overall patient satisfaction may be confounded by patient-level factors, we nevertheless continue to find evidence of a statistically significant and sizable relationship between physicians' communication behaviors and overall patient satisfaction after controlling for such factors.[4]

Multi-dimensional Framework for Patient & Family Engagement Health Care

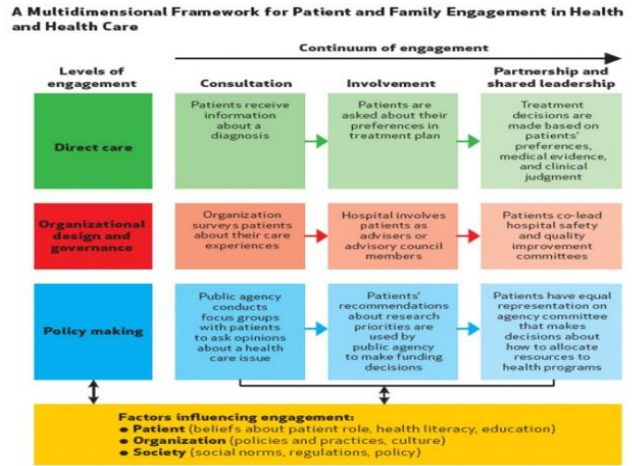


Image – source [6]

III. KEY FACTORS

In healthcare, the last mile is engaging patients to actively participate in their plans of care. Providers can do a great job of using their knowledge and experience, along with evidence-based best practices, to develop a plan of care that they know will improve a patient’s health. None of that will matter, however, if the patient either doesn’t understand what he or she needs to do or chooses not to participate.

There is a preponderance of clinical evidence that demonstrates the improved clinical and financial results that occur when patients are engaged in their own care. Basic common sense will also lead you to that conclusion.

Just as there are strategies patients can actively follow to improve their health, there are strategies healthcare organizations can follow to encourage active patient participation. Following are six of the most essential.[5]

A. Keep the information simple.

It's not very uncommon for providers to use healthcare jargon and acronyms, and most often, simpler terms for those jargon are often ignored.

Use of such complex jargon & terms is acceptable to be used between professionals with advanced degrees and not with patients who are not so literate in terms of medical terminology. Therefore it's critical for providers to use simpler terms to explain the next steps in the plan of care to a patient.

To ensure better understanding, physicians, care providers, & related personals should offer explanations at the middle school level and then determine if such patients can comprehend the material & information.

And if required, information may be needed to be further simplified, enabling the patient to execute the plans.

The same thinking applies to any written materials, print materials video/ audio that is supplied to the patient. Health literacy in the USA is comparatively higher, & even individuals who are educated in other industries have a limited knowledge & understanding of the complex world of healthcare & its jargon. Summing up, keeping the information simple enough for patients to understand becomes one of the key factors for success.

B. Be as specific as possible.

As healthcare providers often tell their patients what needs to be done to improve their health outcomes but don't tell them how to? Providing instruction with vague approach/ ambiguity is like such as “Quit smoking” or “you should lose 20 pounds” is like advising they should drive from New York to Pittsburg without providing a map or a GPS navigation system.

So it's important to keep the information simple; it's equally important for providers to offer information as specific as possible, making it easy for patients to get to the goal and increase their willingness to embark on a journey with the providers.

C. Patient involvement

With rapid communication & information exchange, patients tend to gather detail about the treatment online through google/search engines or speak with colleagues /friends to gather more firsthand information. Patients, especially the upcoming generation, take much more interest in their own health and seek information from other sources, which can be an annoyance to the physicians. However, such a level of information consumption indicates the inclination for the patient to be more active throughout the process of treatment.

Providers can leverage this mindset by getting patients more involved in setting up their health goals. Most often, patients are more likely to follow the plan if they know what they are working towards and the outcomes. e.g., For a patient with borderline sugar level, this might mean avoiding lifelong medication with outcomes towards personal and financial reasons

More concrete the personal goals & objectives are, the chances are higher for the patient to follow the plan and achieve them.

D. Bring Patient-Provider on the same page.

George Bernard Shaw once referred to Britain and America as “two nations divided by a common language.”

The analogy is often true for healthcare providers and their patients. However, the perspective of understanding may differ.

Let's take a simple case of a "healthier diet" patient; when put on a healthier diet plan may follow, but the perspective could be different.

What the provider means for a healthy diet was taking fruits, vegetables & low carb foods, but what the patient perceived was meat & bread.

Therefore, it's imperative to be on the same page and avoid basing assumptions on experience & training. Rather, to focus on when "X" is said by the provider, the patient should not perceive as "Y". Otherwise, the patient may end up adhering to the care plan, which was not intended.

E. Information sharing

As part of the transformation over the years, providers are developing a longitudinal plan of care. Breaking the approach of working in silos, clinicians & care providers work across the spectrum of the facility to provide & ensure patients receive consistent direction & motivation throughout their treatment journey. Taking an extra step, some providers are even joining hands with other players in the ecosystem to take advantage of resources & work towards a common goal

Some provider organizations are even collaborating with payers to take advantage of their resources and work toward a common goal.

The technology of Electronic Medical Record (EMR) is apt for storing information, sharing plans, patient goals, support information & other health data. Which opens the door for sharing information across the clinicians throughout the continuum of the plan and track progress & present unified & consistent message to the patients through their treatment journey

Patient portals (i.e., electronic personal health records tethered to institutional electronic health records) are recognized as a promising mechanism to support greater patient engagement, yet questions remain about how health care leaders, policymakers, and designers can encourage the adoption of patient portals and what factors might contribute to sustained utilization[9]

F. Create accountability

Having covered all other points on sharing information, specific information, making information simple, it's equally important to have measurable accountability, deadlines to encourage participation & also gauge the progress leading to the success of the plan.

Take the example of the weight watchers group (which offers weekly weight checks) & which offers fitness challenges

where big groups are divided into a smaller group that competes to determine challenges posed like who can walk the most, the fastest, furthest distance, amount of weight lost. This kind of fitness challenge helps patients to be motivated and take a cue from peers. And tracking the progress towards goals for individual patients or groups is of great value addition towards driving patient engagement.

Ensure engagement having a great plan of care is important in helping the sick get well, and the healthy remain so. However, the plan only has value if it is followed.

By taking care of these six engagement essentials, healthcare organizations can ensure the last mile of care is as strong as all those before it. It's the key to a happier, healthier patient journey.

IV. BENEFITS OF PATIENT ENGAGEMENT

There are strong indicators that deployment of process & application around patient engagement does have tangible outcomes.

Timely, targeted communication goes a long way in gaining deeper patient engagement.

A. Wellness

It's imperative that patient has full knowledge & understanding of health pertaining to their self-health, well being & options leading to improved care & reduction in urgent care & emergency / unplanned visits.

B. Financial Benefits

Improved patient care & deeper holistic engagement also has tangible financial outcomes/ benefits as it leads to a reduction in no-shows, canceled appointments, helps in increasing revenue by maintaining the existing patient base & increases with new ones.

C. Relationship & Retention

Involving patients in the process of decision-making, healthcare provides can make better-informed decisions regarding health, improving the patient-provider relationship and ultimately paving the way for better retention rates.

D. Time & Cost-efficient

By enhancing the patient engagement levels & with a higher satisfaction index, patients are treated in the most effective way available and ultimately transforming towards better time & more cost-efficient

V. WHAT ARE THE ISSUES?

Just like any major transformation, Patient engagement faces hurdles with the perspective specific to the healthcare industry-

Below are some factors and impediments that may need to be overcome to carry out effective patient engagement

strategies. Few are attributed to patients & their characteristics and proclivities and others to those of providers.

VI. FACTORS INVOLVING PATIENTS:

Most of the time, patients have a high amount of anxiety towards treatment, and for patients to effectively engage in the decision-making process with the provider, a certain degree of health information literacy is required.

Howard Koh, assistant secretary for health at the Department of Health and Human Services, and his co-authors propose a new Health Literate Care Model that assumes that all patients are at risk of not understanding their health conditions or how to deal with them. Health care organizations adopting this model would work to increase health literacy and patient engagement over the entire care span. [6]

Koh and colleagues propose, for example, that health care organizations first adopt the Care Model, formerly known as the Chronic Care Model, a mode of delivering health care that draws on clinical information systems, decision support, and self-management support to provide comprehensive care for chronically ill patients. Then, health literacy strategies would be incorporated into the model, such as the "teach-back" method, in which providers ask patients to explain back to them what the patients have learned, their own understanding of their condition, the options available to them, and their intentions to act on the information.[6]

VII. DIVERSE BACKGROUNDS

Patients across the globe for the providers come from diverse backgrounds, and such factors include ethnicity, culture, language, race, sex, age, education & society, including religious beliefs.

A 2004 Institute of Medicine (IOM) report cited a continuing shortage of minorities among health care professionals, even though ethnic minorities make up ~27% of the U.S. population and are projected to be ~37% in 2025. According to the IOM report, increasing ethnic/racial diversity among health care professionals is important because diversity is associated with improved access to care for ethnic/racial minorities, greater patient choice and satisfaction, better patient-clinician communication, and improved educational experiences for allied health students.

However, becoming culturally competent is a much more daunting task. Culture (and ethnicity) often influence a patient's perceptions of health and illness. Therefore, if healthcare providers appear insensitive to cultural diversity, their actions may negatively affect the quality of the healthcare that they provide.[7]

VIII. COGNITIVE ISSUES

Robert Nease and colleagues of Express Scripts have noted that there are well-known limitations to human decision-making skills and the ability to maintain attention that serves as barriers to patient engagement. They argue that there may be better ways to influence patients' decision-making, such as through "choice architecture," in which decisions to be made are structured so as to "nudge" a patient toward a particular choice. For example, in a pilot study by Express Scripts, patients were required to use preferred, lower-cost drugs before they could "step up" to other options. They were given information about the step-therapy program and given 60 days in which to "opt-out" if they wanted to switch to a non-preferred medication. The opt-out rate was only 1.5 percent, indicating that choice architecture is a potential alternative to other patient engagement approaches.[8]

IX. AVERSION TO CONSIDERING COSTS

One area in which it may be especially hard to engage patients is considering costs in the context of making decisions about their health care. Roseanna Sommers, a Yale Law School student, and coauthors convened 22 focus groups of insured people and asked them about their willingness to weigh costs when deciding among nearly comparable clinical options--for example, to receive a computed tomography scan or undergo a more expensive magnetic resonance imaging after having had a severe headache for three months. Most participants were unwilling to consider costs and generally resisted the less expensive inferior options. [10]

The authors identified a number of factors that lead patients to ignore cost. These factors include patient's preference for the care they perceive to be the best, regardless of expense; an inclination to equate cost with quality; inexperience in considering trade-offs among cost and quality; disregard for costs borne by insurers or society as a whole; and the impulse to act in one's own self-interest even though resources are limited.

One antidote to consumers' aversion to considering costs might be giving them the cost and quality information that they find most useful and relevant to their concerns.

X. FACTORS INVOLVING PROVIDERS

Similar to factors involving patients, there are certain factors involving healthcare providers which have a direct impact on patient engagement.

Studies have identified numerous barriers, including time constraints, insufficient provider training, a lack of incentives, and information system shortcomings.

In one study, Grace Lin of the University of California, San Francisco, and coauthors explored the use of decision aids--DVDs and booklets about colorectal cancer screening and treatment for back pain--at five primary care clinics in Northern California that expressed a willingness to use them. Despite that support, the actual distribution rates for these items remained low, even after staff training sessions and other promotional activities. Some physicians felt that patient input was not warranted, although others had difficulty moving away from traditional physician-directed decision-making. Most physicians cited a lack of time as a major barrier.[11]

That perspective echoed a finding in the systematic review of 38 studies by Légaré and Witteman, which was that clinicians pointed most frequently to time constraints as the primary barrier, even though there was "no robust evidence that more time is required to engage in shared decision making in clinical practice than to offer usual care." [12]

To enhance patient engagement & increase stickiness, communication needs to be targeted, concise, timely & contextual.

It is imperative to reach the right audience at the right time with the right context and establish objectives for each engagement program.

These can include:

- Warm welcome Interactions
- Health risk assessments
- Obtain information/feedback
- Provide information/education
- Promote preventive care
- Identify/close care gaps.
- Medication adherence/compliance

A. Warm Welcome calls

Patient engagement commences even before the patient visits the facility. So it's very important the engagement factor is considered from the first point of interaction. The interactions outside the facility would be in the form of emails, SMS text, phone calls, or chatbots. Therefore, the message conveyed has to be precise and should not confuse the patients.

Similarly, once the patient is inside the facility, the first person, he/she, would interact needs to be warm and pleasing and should be able to help them with activities such as check-in process, billing, navigation, to name a few.

B. Health risk assessments

The key component of entire patient engagement is health risk assessments which is the starting point for the patient's journey into well-being. The screening tools, processes, and their use for the patients is a vital step for better engagement.

It is important for providers including a nurse, doctors, technicians to impart require knowledge towards the screening, process and outcome and in certain scenarios possible next stage for the treatment.

C. Obtain feedback/ information

At every step, gathering feedback and imparting information goes a long way towards the satisfaction of the patient. The feedback mechanism should be very easy and accessible & should be contextual to the services being availed by the patient.

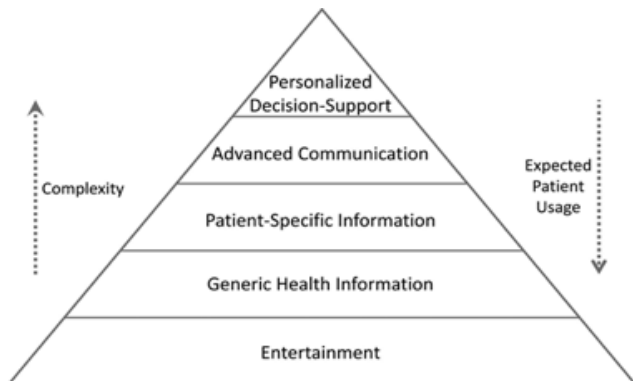
Also, imparting the right information at every stage of the journey gives a holistic view of patient satisfaction.

Feedback can be through kiosks, feedback display machines, online links sent through email, SMS, or simple paper with a set of questions.

D. Provide information/ Education

At every step, gathering feedback and imparting information goes a long way towards the satisfaction of the patient. The feedback mechanism should be very easy and accessible & should be contextual to the services being availed by the patient can be of three types-

- a) Education- educating patients with certain health information, e.g., preventive care on diabetics. Not targeted to one patient but to a group of patients with specific traits
- b) Generic information- information that is generic in nature, e.g., health information for a county, city, or country
- c) Specific – this is very specific to the patient's health, offering tips and also include information such as blood reports, etc., in a different format.



E. Promote preventive care

There are multiple benefits to promoting preventive feedback. And such benefits are included, ranging from making the country more health aware to leading to early diagnosis of chronic diseases.

Preventive care and checkup can lead to better patient engagement and would also lead to better trust factor between patient and provider.

F. Identify/ Close care gaps

Patient engagement is all about how we can communicate effectively with patients; may it be online or in-person, at every touchpoint of patient experience, providers and patients both experience gaps. Bringing the gap closer would ensure a better satisfaction index of the patient journey.

E.g., if providers witness a high amount of wait time with a specific department/service, they can add additional nurses/ doctors/ technicians to bring that down and ultimately give a better patient experience which in turn translates to an improvement in patient engagement.

G. Medication adherence/compliance

The Healthcare industry is highly regulated to the complexity in nature involving the health of living beings. Therefore with the evolution of the medical field, more regulations have been put in place in order to streamline the providers.

In today's complex world, adherence has gained a lot of significance and its imperatives for providers to adhere to policies and also comply with those. E.g., HIPAA- Health Insurance Portability and Accountability Act which covers security rule compliance. Keeping patient data safe requires healthcare organizations to exercise best practices in **three** areas: administrative, physical security, and technical security.

To summarize, by focusing on the 6 main factors, providers will have a good amount of traction build to enhance patient engagement, ultimately leading to higher patient satisfaction.

XI. BENEFITS TO PROVIDERS

While providers deploy Artificial intelligence-based more Patient-focused care-based solutions, it offers a unique proposition for healthcare providers.

With solutions unlocking a varied amount of data and datasets, providers would be able to engage with applications that can bring them closer to patients.

Similarly, deploying various engaging solutions spreading over different channels can become an educational tool for their well-being.

Therefore, implementing the application will offer providers to focus on patient care improvement more holistically & offer immense benefits towards patient engagement, which

leads to better satisfaction & ultimately towards an increase in topline & bottom-line revenue for providers.

XII. REVIEW OF EXISTING STUDY

Daniel Mullins, Abdulla M. Abdulhalim, Danielle C. Lavallee, et al., (2013), The goal of comparative effectiveness research (CER) is to provide patients, their advocates and caregivers, health care professionals, federal officials, policymakers, and payers with evidence-based information to make informed health care decisions.^{1,2} Previously, CER studies were designed by researchers and had relatively little input from patients. Patient engagement has rapidly gained acceptance as crucial to the successful translation of CER for all interested parties.³ Experiences with patient engagement in research, including community-based participatory research,⁴ suggest that success hinges on patients being interested and emotionally involved in the research question and understanding their role in the CER process.

Jennifer E Prey, Janet Woollen, Lauren Wilcox, Alexander D Sackeim, George Hripcsak, Suzanne Bakken, Susan Restaino, Steven Feiner, David K Vawdrey, et al., (2013) Engaging patients in their healthcare is a growing trend. The Institute of Medicine (IOM) has recommended that individuals receive opportunities to access appropriate medical information and clinical knowledge, enabling them to be the 'source of control' in making healthcare decisions. By increasing patient participation, it is believed that patients can experience higher satisfaction and better health outcomes.

Article by Zimmerli et al. discussing the effects of different design features for virtual reality exercises in engaging patients in lower extremity motor rehabilitation. One of Zimmerli's main points is that the use of health technologies is highly relevant for active and continuous patient engagement during robotic-assisted rehabilitation; however, Zimmerli suggests that patient preferences and expectations should be taken into more consideration when designing virtual reality exercises for every day, clinical motor rehabilitation.

Arksey and O'Malley's and Levac et al.'s framework for scoping reviews, we designed our protocol to identify relevant a) published articles through systematic searches of 7 electronic databases and snowball sampling and b) unpublished articles through systematic searches of databases and websites and snowball sampling. We will include published and unpublished models and frameworks of patient engagement in health services research and exclude those not in English or unavailable as full texts. Two reviewers will independently screen the abstracts and full texts of identified articles for inclusion and extract relevant data; a third reviewer will resolve disagreements. We will conduct a descriptive analysis of the characteristics (i.e., elements

underlying patient engagement and those related to the study authors, publication, and model/framework) of included articles and a narrative analysis of the data concerning elements of the model or framework. Our primary objective is to count and describe elements of patient engagement that overlap (present in ≥ 2) and diverge (present in < 2) among identified models and frameworks. Discussion: Through the identification of elements that overlap and diverge between existing models and frameworks, this review will provide a starting point for the critical reflection on our collective understanding of what patient engagement in health services research *is* and/or *could be*. Ultimately, we hope that the findings of this review raise awareness of existing models and frameworks and shed light on some of the complexity of conducting engaged patient research through the identification of key elements that shape this approach.

One area in which patient engagement has been historically limited is within the hospital. For many patients, hospitals are unfamiliar, isolating places filled with anxiety and unanswered questions. Being a hospital patient has been called 'one of the most disempowering situations one can experience in modern society. In a survey of hospital patients conducted by Cumbler *et al.*, 90% of respondents said they wanted to review their hospital medication list for accuracy, but only 28% were given the opportunity to do so. O'Leary *et al.* reported that only 32% of hospital patients surveyed could correctly name even one of their hospital physicians. A popular account of the difficulties faced by hospital patients is found in the 1980 autobiographical Martha Weinman Lear book, adapted as the Mary Tyler Moore television movie, *Heartsounds*. The protagonist is a doctor-turned-patient whose care team ignores him as he nears death from heart failure. His wife makes the illustrative statement, 'I marveled ... He is a doctor; he is white and middle-class; he has a wife who can make demands in his name; he is a private-room patient in a great medical institution; he is gravely sick; what the bloody hell goes on in the wards?'

Balagopal Ramdurai et al., In the current years, due to the significant developments in technologies in almost every domain, the standard of living has been improved. The emergence of the latest innovations, advanced machinery, and equipment, especially in the healthcare domain, has simplified the diagonalizing process to a wide extent. Smart techniques employed in medical applications resolved the detection and rectification of various diseases. This work reviews the cloud-based mobile application for stroke patients. The prime goal of this research is to study the challenges and necessary measures to be implemented for the rehabilitation of patients post-stroke. Furthermore, the existing cloud-based services and the techniques to be modified for the improvement in the patients' health status need to be explored

Patient Activation Measure (PAM) developed by Hibbard *et al.* The PAM is a 22-item questionnaire that measures the activation of the patient in managing his/her health. Future research would benefit from the development of an ontological framework for describing and measuring patient engagement to provide a common vocabulary for research in this area.

Wilcox *et al.* abused inpatient interviews to explore requirements for medication IT. They found patients were often confused by frequent changes in medication therapies and desired verbal briefings to be supplemented with electronic information. In particular, patients thought that having a record available would help them gauge therapeutic progress. Patients also desired the ability to read educational information about their medications and to be able to validate a list of their home medications.

With the need to reduce healthcare costs and the movement towards personalized healthcare, the healthcare industry faces challenges in essential areas like electronic record management, data integration, and computer-aided diagnoses and disease predictions. Machine Learning offers a wide range of tools, techniques, and frameworks to address these challenges.

XIII. CONCLUSION

To sum up the paper, there are tremendous gaps that exist regarding patient engagement in the healthcare ecosystem. A lot of research & work needs to be carried out with tangible outcomes. As Henwood *et al.* [33] noted, ‘the informed patient will not emerge naturally or easily within existing structures and relationships’. Future studies should focus on identifying optimal methods for engaging patients and rigorously examining the impact of these methods on the healthcare delivery process. Specifically, there is a clear need for both methodological and practical research on inpatient engagement that addresses health outcomes and cost-effectiveness.

Patient engagement has become an important cornerstone for success amid growing competition for healthcare providers. And recent study & survey shows a growing number of investments towards enhancing patient engagement. Technologies combined with Artificial intelligence do show there is the possibility of the tangible outcome, which does have an increase in patient engagement & satisfaction.

Applications & Technologies addressing factors covering pre-visits & post-visits such as welcome, to conduct health assessment & informed screening, imparting education & knowledge to the patients to obtaining the feedback and acting on that feedback will go a long way towards the success of patient engagement program.

Healthcare technologies provider must start gearing up to start developing an intelligent application in aiding providers with deeper patient engagement & enhanced care.

Ultimately, providers need to embrace technologies & tools to achieve goals set for deeper & better patient engagement.

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