

Addressing Patient Waiting Times in Low-Resource Environments

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ABSTRACT

Long patient waiting times are widely prevalent in healthcare settings across the world and negatively impact patient experience. We examine the notion of patient waiting time in two distinct low-resource Indian contexts, analyzing our empirical findings as they relate to (1) actual waiting time or the actual time spent in the clinic, (2) perceived waiting time or the time the patient thinks he/she waited, and (3) preventable waiting time, which refers to the increased patient load due to patients' lack of awareness and/or lack of skill for self-management of chronic illnesses. We also provide design recommendations to suggest how existing ICT applications might be leveraged to address these dimensions of patient waiting time in low-resource healthcare environments.

Keywords

mHealth; waiting times; India; ICTD

Categories and Subject Descriptors

H.5.m. [Information Interfaces and Presentation (e.g. HCI)]: Miscellaneous

1. INTRODUCTION

Long waiting times adversely impact patient experience and subsequent adoption of the product or service in question. In healthcare environments, long waiting times remain a persistent concern, particularly in resource-constrained contexts where clinics are overcrowded and patient-doctor ratios are significant [7]. We present a mixed-methods study of waiting times affecting patient experience in two different clinical settings in and near Ahmedabad (Gujarat, India) - one with a working appointment system and one without. We use a combination of survey and interview findings at a rural and an urban clinic to make two contributions. First, we build on the existing understanding and classification of waiting times in these settings and aim for an actionable breakdown of the problem. Second, we present design recommendations that account for context and highlight the potential of leveraging existing technology

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ICTD '16 June 03-06, 2016, Ann Arbor, MI, USA

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ACM ISBN 978-1-4503-4306-0/16/06.

DOI: <http://dx.doi.org/10.1145/2909609.2909643>

innovations for a process-oriented solution. Although our focus is on low-resource Indian settings, our conceptualization of the waiting time problem could be useful for researchers and practitioners operating in alternative contexts as well.

2. THE IMPACT OF WAITING

Waiting times are a critical component of patient experience in healthcare facilities. In certain rural and urban Indian settings, where health care centers have traditionally been under-resourced in personnel and facilities, patients have to wait hours for a consultation. Our literature review affirms that this problem extends to healthcare settings across the world, including North-Western Nigeria [7], OECD countries [6], and Uganda [4], among several other countries: *"Patients perceive long waiting times as a barrier to actually obtaining services and keeping patients waiting unnecessarily can be a cause of stress for both patient and doctor [7]."* Though literature on analyses of the implications of waiting times in the developing world context is sparse, a study conducted in the US [9] recently analyzed the impact of rising waiting times on overall patient satisfaction. Together, these papers discuss the impact of long waiting times in terms of transportation costs involved for repeat visits when the first one is unsuccessful, loss of earnings from time spent at the clinic for patients and caregivers, burden on household responsibilities particularly for young brides, greater vulnerability to diseases due to prolonged exposure to germs, movement away from public to expensive private institutions, and avoidance of primary care visits that are misjudged as non-urgent.

3. METHODOLOGY

We attended a clinical summit in 2015 that was part of a weekend-long hackathon in Bangalore (Karnataka, India). This summit was attended by health care professionals - including medical doctors, public health experts, and community health workers - in addition to researchers, engineers, designers, entrepreneurs, and other stakeholders in India's growing 'MedTech' industry. After several targeted panel discussions, presentations, and brainstorming exercises, participants compiled a list of problems urgently needing attention in the Indian public health sector. One of these challenges was listed as follows: *"Primary health centers in India have low resources - both in terms of personnel and facilities. Patients have to wait for hours for a consultation, which results in loss of income and strain. Methods of work, supported by technology-based systems, are required to reduce strain for healthcare providers and patients alike."* We undertook this challenge because we (first and second authors) have repeatedly heard it discussed without resolution at prior venues. By the end of the hackathon, we had undergone repeat iterations on our research design and received feed-

back from multiple experts and stakeholders. We collated feedback and obtained further validation from design, technology, and public health experts before we began the study mentioned below.

We conducted observations and interviews at two field sites in and near Ahmedabad (Gujarat, India) to enrich our understanding of different dimensions of patient experience and waiting times. These sites included one rural clinic (RC) - a Community Healthcare Center (CHC) in Vastrapur on the outskirts of Ahmedabad and one urban clinic (UC) for endocrinological and metabolic disorders (largely non-urgent care such as for diabetes, lipid disorder, and thyroid patients). In our first round of data collection, we conducted participant observation for 8 weeks, surveying 151 patients at RC in the first 3 weeks and 102 patients at UC in the next 3. In our second and follow-up round of data collection in the last 2 weeks, we conducted in-depth interviews of 14 patients, 16 caregivers, 3 physicians, and 4 staff at RC and 19 patients, 8 caregivers, 3 physicians, and 6 staff at UC.

Our survey included questions regarding patient demographics, existing technology practices, patient visits to the clinic - with a focus on waiting times, and queue management details. We also brainstormed with patients so they could suggest ways to address the inconvenience of waiting. Our follow-up interviews of patients solicited further detail. We also interviewed physicians and the clinics' staff to obtain a more complete assessment of the sociotechnical context.

4. SURVEY FINDINGS

We briefly discuss survey findings on patient demographics, patient visits, waiting times, and queue management.

4.1 Patient Demographics

In RC, we collected data from 70 men and 85 women. Their ages ranged from 18 to 60 and the average age was 41.2. Approximately 24% had low literacy, 64% had studied up to high school, and only 12% had pursued a college degree. As for employment, 42% were housewives, 33% were laborers, and 25% were engaged in small jobs/businesses. Approximately 75% had a monthly family income of less than INR 10K (USD 150), 25% earned INR 10K-20K (unto USD 300), and only 9% earned more than INR 20K. Finally, 93% claimed that they had shared/individual access to a mobile phone.

In UC, we collected data from 45 men and 57 women. Their ages ranged from 35 to 70 and the average age was 54.1, higher than in RC because the patients mostly suffered from endocrinological concerns. Since the clinic was located in an urban setting, only 8% reported zero or low literacy, 18% had studied up to high school, and 75% had pursued a college degree. Approximately 14% of the patients surveyed were housewives, only 3% were laborers, and 83% were otherwise employed. Incomes were also higher here, as 21% earned less than INR 10K, 30% earned INR 10K-20K, and the rest earned more than INR 20K. Only 1% did not have access to a mobile phone.

4.2 Patient Visits

Most hospital visits we observed were of non-urgent nature or, in other words, were planned visits, as voiced by patients (and corroborated by physicians). In RC, 75% of the 155 patients came to the clinic for non-urgent reasons while the corresponding figure in UC was 92.1% (given the nature of the clinic). A follow-up visit was required of 91% UC patients and 84% RC patients. The former is natural, given that patients at this clinic suffered largely from chronic diseases. In the latter case, it is worth noting that 30% of the patients were pregnant women making their antenatal care (ANC) visits. In both clinics, over 90% patients claimed that they

would visit the clinic again for the same or for a different ailment.

4.3 Waiting Times

The average actual waiting time was 63 minutes in RC and 49 minutes in UC. Further, the actual waiting time for 64% of the RC participants and 51% of the UC participants was longer than an hour. Most patients in both clinics complained about waiting time. Only 13% of RC visitors claimed that waiting time was not an inconvenience (even when it was well over an hour). On the other hand, fewer than 5% of UC patients felt the same. Most clinic visitors who were laborers and farmers earning daily wages felt that longer waiting times were a significant nuisance as these resulted in a loss of wages. Further, as anticipated, 85% of the women who visited the clinic complained that they had to abandon urgent household chores, including tending to dependents such as children or elderly members of the household.

We tried to determine how long patients actually spent in the clinics, but also wanted to ascertain how long - on a scale from 1 (best) to 5 (worst) - they *felt* they had spent. In RC, the average score was a 3.5 out of 5, with 45% of our participants claiming that the waiting time was very long. In UC, the average score was a 2.9 out of 5 and 37% of the respondents complained that wait time was too long. Our interview data gives us further insight on what these numbers meant.

4.4 Queue Management

It must be noted that UC had an appointment system, managed by a receptionist who told the calling patient to arrive at the clinic at a specific time of day. More than 90% of our respondents had called to seek an appointment. On the other hand, there was no formal queue management system in RC. None of the patients had called the clinic before leaving their homes, not even to ask whether the doctor was in. Nearly 70% of rural respondents claimed they knew the doctors' schedules from their past visits and through other informal sources, while 22% of them walked in without checking on the doctors' availability.

5. INTERVIEW FINDINGS

We now present our interview findings, that we organized into subsections discussing *actual* waiting times, *perceived* waiting times, and *preventable* waiting times. This framework draws upon existing literature on waiting times in healthcare settings [9, 1].

5.1 Actual Waiting Times

We computed actual waiting times by measuring the time that lapsed after the patient entered the clinic and until he/she was able to meet with the doctor. Our participants agreed that there were costs involved in waiting, but they did not have an option. This also meant that they did not make an effort to ascertain how long their wait would be beforehand. One rural participant shared: *"No, I did not call the hospital before coming ... I think nobody does ... We just walk in ... Sometimes we ask the neighbors or the local person at the tea shop if they know what the availability of the doctors is like and they might tell you if they have visited the hospital or have met someone in recent hours who has gone."*

Since UC had an appointment system in place, patients did call, although their waiting times remained reasonably long (lower than those at RC). This could be attributed to the nature of illness of the patients visiting UC. Most of them had an endocrinological disorder such as diabetes, as mentioned, and generally had to wait for their lab reports (for roughly 45 minutes) before they could consult with the doctor: *"Once we come here and give blood for sugar test,*

we have to wait for the report and then the doctor calls us. Waiting time is about 40 minutes.”

The absence of an appointment system in rural clinics points to an important lacuna that could be filled. The larger question is whether all stakeholders would be keen to implement it [2] and how we can leverage available and familiar technological solutions to address this challenge.

5.2 Perceived Waiting Times

The perceived waiting time - or the length of time patients *felt* they had spent in the clinic - arguably has a more serious impact on patient experience than the actual time they waited [9]. As our survey findings showed, perceived waiting times were longer for RC than for UC. This is likely explained by the fact that UC patients typically took an appointment before coming and were prepared to wait. Another major factor has to do with what the patients (and caregivers) *did* while they waited. Approximately 84% of them at RC said that they did “*nothing*” while waiting. This may not literally mean nothing, but indicates that they did not find ways to engage themselves while waiting. UC gave visitors access to educational materials related to diabetes such as dietary recommendations or suggestions regarding lifestyle modifications. As one patient shared, “*While we wait, we read these magazines, look at the posters, or use our mobiles.*” Instructional material in the form of brochures, magazines, and posters was displayed on the walls of UC. Further, the clinic had a small television display where educational material played on repeat. This information was useful in engaging the audience and improving the overall patient experience.

Roughly 67% of the RC visitors expressly stated a desire to be informed along similar lines, requesting that health-related information be provided to them as they waited. When asked what *kind* of information they wanted, more than 90% stressed that they wished to know more about their current illness. This is not surprising, since we would expect their current concerns to seem most relevant. For example, pregnant patients were understandably most concerned about their pregnancy, and asked to be informed about health concerns to watch out for while they waited. In UC, more than 94% of the visitors shared that they wished to be provided more information about their illness as they waited.

Research has shown that how the waiting time is being filled is an important determinant of perceived service quality [3]. Patients in both clinics emphasized that the most valuable source of health information for them was the interaction with their doctors. However, as a pregnant patient at RC shared, “*There is too much rush here... always... but we come here as this is nearby. We don’t ask them (hospital staff and doctors) if we have doubts. They are too busy to give a proper reply... we sometimes go to ASHAs [Accredited Social Health Activists] if we need to know.*” Posters and charts in the clinic do help. On a scale from 1 (least important) to 5 (most important), patient-doctor interaction was ranked at an average of 3.8 while posters and educational material were ranked at an average of 2.9. This feedback indicated that the time spent in the waiting room could be effectively utilized for health education - especially since these patients demonstrated high receptivity for such information as they waited - and potentially reduce perceived waiting time.

5.3 Preventable Waiting Times

Doctors and clinic staff posited that one of the important aspects of highly crowded waiting areas is the lack of awareness patients have regarding their illness. For instance, the general practitioner at RC explained: “*Many times these patients don’t know about the*

self-limiting nature of mild viral diarrhoea. These type of patients usually come to hospital for consultation without understanding that it does not require any treatment. If these patients are aware of when to visit the hospital, half of my rush will be taken care of.” The endocrinologist in UC corroborated this claim, adding: “*Proper patient education would not only decrease the anxiety associated with illness, it would also prevent unnecessary visits to the hospitals.*” Another physician in UC explained: “*Most of the diabetic patients I see daily come for routine follow up. Actually the number of their visits could be drastically reduced if they are taught, and they implement self-management of the illness at home.*”

We classify this category of unnecessary visits resulting in crowded clinics as *preventable waiting time*, roughly alluded to in [1]. With proper education and awareness, particularly regarding chronic ailments, higher self-efficacy could potentially reduce the number of redundant visits by the patients and improve overall actual waiting times in the long term.

6. DESIGN GOALS

Our findings led us to factor in the needs and concerns of our study participants and deconstruct our design goals as follows. First, how can we reduce *actual* waiting times? Second, how can we effectively utilize waiting times to reduce *perceived* waiting times? And third, how can we generate awareness so that future visits are relevant and meaningful to reduce *preventable* waiting times? We clarify here that our primary focus is on improving patient experience in rural clinics that are significantly resource-constrained. The data collected at UC has been tremendously helpful in providing us with the perspective of a slightly better equipped setting *with an existing appointment system*.

7. DESIGN RECOMMENDATIONS

Based on our understanding and articulation of the problem space, we offer design recommendations towards a process-oriented, contextually appropriate, and holistic approach to addressing the above design goals.

Our brainstorming with RC participants revealed their willingness to explore lightweight mobile-based solutions with a gentle learning curve. Given recent ICTD research on Interactive Voice Response (IVR) systems based on recent ICTD research [10, 8], we recommend that their utility be explored to address queue management in this context. These are low-cost systems that require a basic phone call or SMS from the patient’s end and low-overhead queue management on the clinic’s end. The system would hold a spot for the patient - based on a regular or missed call - and also update the patient regarding the time remaining for his/her appointment. The system design depends on the direct proportionality of waiting times to the list of callers. The clinic would simply need to “pop” a caller/patient off the “stack” every time a patient was called in to be seen.

Patients’ perceived waiting times could be reduced by engaging them in the waiting area. If this engagement entailed relevant and instructive health content - to build awareness regarding common ailments, based on inputs received from patients, our findings indicate that they are likely to feel that their time in the clinic was effectively utilized. Here, we reference a project currently implemented in rural UP called Projecting Health [5], where videos have been created and disseminated locally - by and for the community - for maternal and newborn health. The design of local/hyperlocal content to make the patients aware of their health condition and enhance their self-management skills might also help in reducing the preventable waiting times mentioned above.

8. CONCLUSION

The contributions we make with this paper are three-fold. We provide the motivation and contextual needs assessment for a widely prevalent problem in global health, formulating it with a view to highlight the role that ICTD approaches could play towards addressing it. We aim for this to invite additional research efforts from other researchers/practitioners in the community. We also further ICTD conversations in two ways. We emphasize the relevance of looking not for perfect and clean solutions but for *partial* solutions, which may be significantly easier to devise and deploy and can have meaningful impact, even though they may not completely eliminate the problem. Finally, we demonstrate the approach of addressing ICTD problems from a *process innovation* standpoint and not a technology innovation standpoint. This can lead us to discovering a multi-faceted design that might leverage the affordances of a combination of technologies, a less explored approach to ICTD research.

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