

Evaluation of HelloDoctor 24x7 Healthcare Services in Rural India: A Case Study

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Abstract—The poor state of healthcare systems and outcomes in developing countries is widely known. There has been a growth in telephone consultation to assess patients' symptoms, providing health information and referring patients to appropriate levels of care. In this case study, we evaluate the utilization of HelloDoctor 24X7 health hotline services aimed to facilitate health information, consultation and referral services over a three month period (June-Sep 2011) in the State of Orissa, India. A total of 1900 calls were received during this three month period. Gender data was available on 1377 callers of which 74% calls (n=1023) were made by males. 68% of the calls were made in the evening. Health information was delivered in 11% of the cases, doctor information was provided in 6%, and hospital information and medicine related general information was delivered in 6% of the cases. Of the total 1900 calls made, only 94 were referred during this time period that included 17% of the calls being actually referred to the specialists. 48% of the calls were made to gather information about treatment and 8% gathered information about medicines. Common ailments for which the calls were made included fever, diarrhea and vomiting, diet and weight management, allergies and women health related issues.

Keywords-health hotlines; evaluation; rural; triage; information.

I. INTRODUCTION

There has been an increase in the use of telephone consultation and triage; the process where calls, from people with a health care problem, are received, assessed and managed by giving advice or by referral to a more appropriate service [1]. These systems, in general, aim to help with the provision of out of hours care, manage demand for care, or provide an additional source of help and advice that is not limited to out of hours care alone.

Health hotlines are medical call centers that provide health-related information, advice, referrals, and sometimes prescriptions to individual callers over a phone line [2]. Callers are connected to health professionals such as nurses, paramedics, or physicians, who usually follow standard protocols to assess medical situations and provide information and advice. Health hotline is described as a service whose main goal is to provide medical advice and information over the telephone and has following four characteristics [2]: (a) it primarily gives information to callers who are individual patients, but many also serve as medical personnel or health workers, delivers information to callers mainly through a voice call, over the caller's wireless or landline telephone connection, (c) more inbound service as it receives many more calls than it makes; the limited number of outbound calls may be for follow up or reminders and (d) callers may be anywhere and need not be at a specific location such as a telemedicine center, a health clinic or with a health worker. Health hotlines provide several services such as medical information, triage, consultation, diagnosis, referral, treatment and counseling.

The poor state of healthcare systems and outcomes in developing countries is widely known. There are more than four billion mobile connections-most in developing countries-health hotlines accessible to mobile phone basic health information [2]. This can provide care even to people in sparsely populated or low income areas where there are few health care facilities and doctors. There are several factors that might hinder achieving good health outcomes and these include lack of primary care physicians, lack of financial resources to consult better quality providers, high cost of health facilities and presence of low quality primary care facilities and personnel are often not highly skilled.

People lack basic information about the location and availability of pharmacies, clinics and laboratories and about prescription medicines. People widely consult with informal, sometimes traditional, healthcare providers who may not be trained or ethical [3]. Poor information leads to poor healthcare outcomes. Individuals spend time and money to go to the doctor because they don't know the

condition and travel long distances to find that the healthcare provider is unavailable. Health hotline providers in developing countries have been and utilize diverse approaches to deliver healthcare services. These include deploying of phone and video units at pharmacies linked to health hotline [4], multiple interventions in rural areas to strengthen and supplement health system [5], integration of patient records with existing facilities and build new clinics [6] and expansion of rural telemedicine facilities [7]. The hotlines utilize health call agents from diverse backgrounds and roles and responsibilities and can include doctors, nurses, paramedics and non medical personnel. Several health hotlines have been developed in developing countries including Pakistan [4], India [5], Mexico [6] and Bangladesh [7]. Health Management Research Institute (HMRI) is a not for profit organization and offers free services includes phone consults, counseling and complaints, information on facilities and drugs and mobile health clinics [5]. The top caller complaints in this case were recurring abdominal pain and back and knee pain [5].

However, Health line is for profit organization offering phone consults information on facilities and drugs, test results interpretation and discounts on hospital visits. The major caller complaints included chronic diseases, ENT, early pregnancy, and diarrhea [7]. Health hotlines may be sponsored by a government, a healthcare provider, or a Mobile Network Operator (MNO) and some are independent. Health hotline providers can provide proper information at right times that can significantly reduce the overall cost associated with healthcare. Informed individuals can prevent adverse health outcomes, treat some conditions themselves, and make the right decisions during medical emergencies. A health hotline can create a low-cost, widespread, infrastructural model for the delivery of health information. Health hotlines face several challenges such as difficulty in identifying who and what services to offer, reimbursement model associated with these services, measures of effectiveness of these services, associated medical liabilities and how can these services be sustainable. Another major limitation of existing Health hotlines is the limited evaluation of these services especially in developing countries. There is a continuous ongoing need to evaluate and gauge effectiveness of Health Hotline programs.

The objective of our study is to evaluate —Hello Doctor 24X7 healthcare services, a health hotline aimed to deliver health information, consultations, and triage and referral services to individuals from diverse settings such as urban, rural and tribal in the State of Orissa, India.

HelloDoctor 24x7 healthcare services

HelloDoctor 24X7 [8] provides an opportunity for healthcare service providers to extend their services and facilities to the patients in need. As a result, general public is empowered to make informed decisions. People anytime, anywhere can dial on 0674-66 55 555 and can have

necessary information to take proper healthcare decisions free of cost. It uses a Peopletch call center [9] package that sends calls to a health call agent and allows an agent to place calls. It can run in an inbound, outbound (as predictive or manual dialing) or blended capacity (handling inbound and outbound calls in the same agent session). There is also the ability to allow for Interactive Voice Response (IVR) applications interacting with customers' calls. The HelloDoctor 24X7 services have both individual and institutional members. The program is managed by individuals with two roles: health advice officers and healthcare associates.

These individuals had diverse backgrounds and included healthcare professionals including medical trained allopathic doctors, other professionals including (Ayuvedic / Homeopathic / Physiotherapy), nurses or other paramedical staff. The professionals were trained in addressing the needs of the health information seekers. An initial training was provided to the different health advice officers and healthcare associates. The Hello Doctor 24X7 has developed clinical protocols for the management of minor ailments and while initial support can be provided by the health advise officers and if needed the calls can be triaged to the specialists. The health information service providers support for providing health information relevant to specific hospitals, nursing homes, clinics, consultants, blood donors, ambulance and information about the doctors on call.

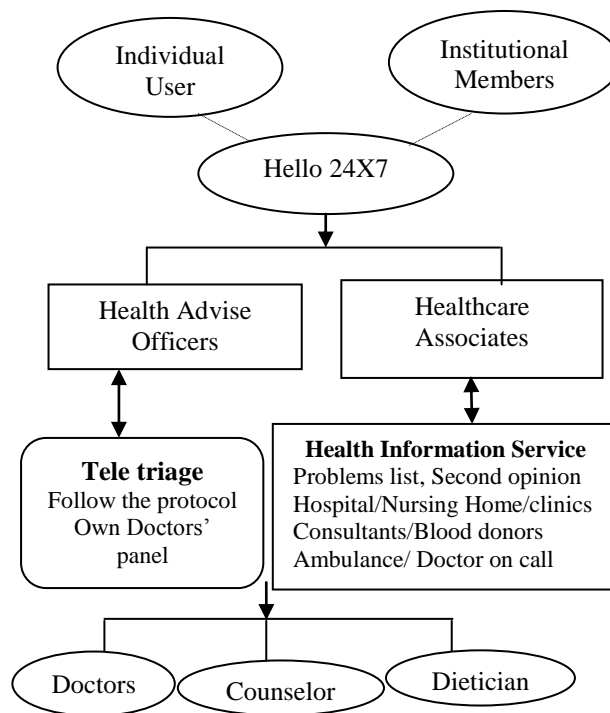


Figure 1. HelloDoctor 24X7 healthcare delivery services

II. METHODS

Analysis was performed on the data gathered during June 2011-Sep-2011 using the HelloDoctor 24X7 services. The data recorded during every call included caller id, date and time of the call, age, gender, purpose and if the call was triaged or not. The entire data gets stored in the Microsoft SQL database. For the purpose of this study we particularly explored the utilization of HelloDoctor 24X7 services over 3 month period (June-Sep 2011). The date and time variable was further stratified into month, day (Monday to Sunday) and time (morning/afternoon) to explore and better understand the temporal utilization of these services.

III. STATISTICAL ANALYSIS

Descriptive analysis was performed and means and standard deviation was reported for the continuous variables and frequency distribution for the categorical variables. Stratified analysis was performed to examine the average number of calls during different days and time. Further stratified analysis was performed to determine differences in the number of health information calls made either by males or females during this time period. Correlation analysis was performed to determine association between the number of calls and the day (i.e. Monday to Sunday) and time (morning/afternoon) of the calls. All analysis was performed using SAS version 9.1

IV. RESULTS

Overall 1900 calls were made during a 3 month period (June-Sep 2011) (Figure2). There has been a consistent increase in the total number of calls over these months. The average age of the callers was 20 years (SD=20.6). Gender data was available on 1377 callers of which 74% (n=1023) were males and 26% (n=354) were females. 68% (n=1345) of the calls were made in the evening as compared to the remaining 32% calls that were made in the morning (n=554). Fifty three calls have been received for the month of September (Till September 3, 2011).

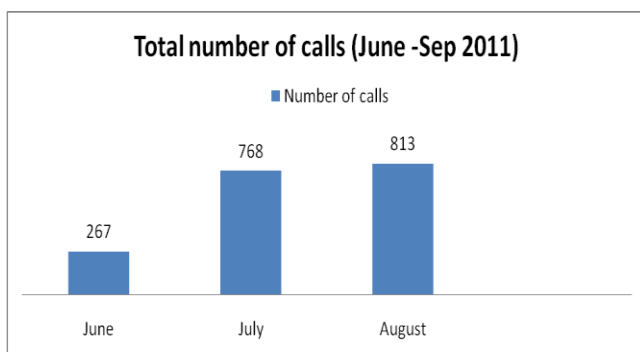


Figure 2. Total number of calls during June-Sep 2011

We also performed analysis to explore temporal utilization of these health information calls. Figure3 illustrates that the majority of calls were made on Friday (n=300/1900),

followed by Wednesday (n=273/1900) and Saturday (n=272/1900). Our results reflect a change in the utilization of health information calls using the HelloDoctor 24X7 services.

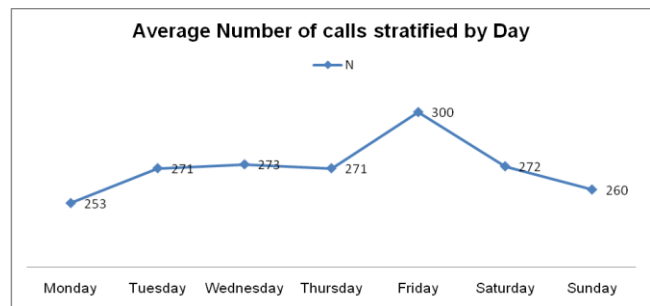


Figure 3. Average number of calls stratified by days of the week

Results also show that majority of the calls were made in the afternoon for the different days of the week (Figure4). Majority of the calls were made on Thursday afternoon (n=204) followed by Friday afternoon (n=203). Results showed that the lowest number of calls were made on Thursday morning (n=67)

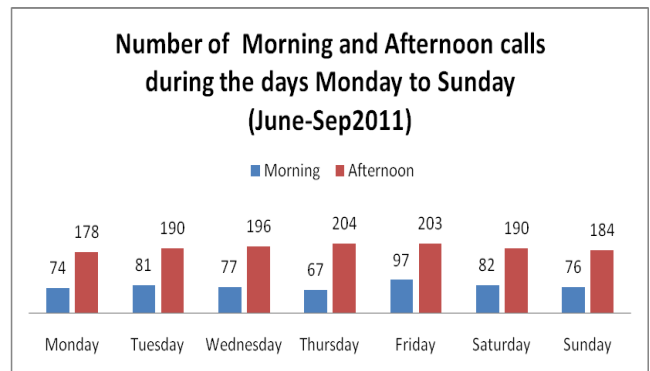


Figure 4. Calls stratified by the time of the day

Our results also showed gender disparity in the utilization of HelloDoctor 24x7 healthcare services (Figure5). Males were consistently making use of these services than females for all the days of the week. Most of the calls by males were made on Sunday while most of the calls by females were made on Monday.

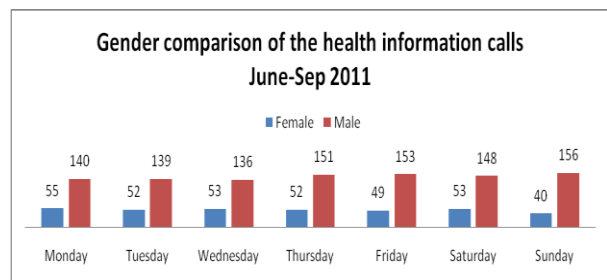


Figure 5. Gender comparisons of health information calls

Additional analysis was performed to determine the characteristics of the calls during the time period from June-Sep2011. Results found 18% (n=340) of the calls to be prank calls. In 11% (n=210) of the cases, health information was received, doctor information was provided in 6% (n=121), hospital information and medicine related general information in 6% (n=108) cases. Additional calls gathered neurologist (4%; n=73), orthopedic, obstetrics and skin and venereal disease related information (3%; n=63).

We also performed triage analysis to determine the frequency of calls that were referred to the specialists. Of the total 1900 calls made during this time period, 94 were referred. Of these calls, only 17% (n=16) of the calls were actually referred to the specialists. 46% (n=43/94) of the calls were made to gather information, 48% (n=45/94) of the calls focused primarily on treatment and the remaining 8% (n=6/94) was to gather information about medicines. Common ailments for which the calls were made included fever, diarrhea and vomiting, diet and weight management, allergies and women health related issues.

V. DISCUSSION

Telephone access and consultation can be used to overcome geographical barriers. Health hotline provides health information and can help the public make informed decisions. They can also help in providing information and handling surges during specific emergency responses.

Previous studies have shown that people from the remote areas in Bangladesh, now find it convenient to pick up their mobiles and call for help. The rural areas, where 80% of the populations inhabit, lack hospitals, clinics, health facilities and particularly qualified doctors. To be able to talk to a doctor is a unique privilege for the villager or an individual in a regular medical situation or emergency. However, there is a significant need to continuously evaluate health hotlines programs so that greater adoption and dissemination of these services can be done.

The results of our study present an overview of the utilization of the health hotline program HelloDoctor 24X7 serving the rural areas of Orissa. The program facilitates delivery of health information, consultation, triage and referral services. Results of our study show significant age and gender variation in seeking HelloDoctor 24X7 healthcare services. Males were likely to utilize these services. Results showed significant variation in the times when these calls are made. Majority of the calls were made during afternoon than morning that might reflect a need of more trained staff when the call load is more. Health hotlines is an excellent way to answer and be in touch with those who consider this service as a place where to find somebody interested in their requests, for not having, sometimes, the possibility to access to information otherwise.

However, there are several limitations of the study. The health hotline delivery model is not a full substitute for traditional, in person modes of health information delivery.

Several factors also limit the ability of health hotlines to provide information and advice to callers. First, some callers require in-person consultations, prescription drugs, or other treatments that may not be affordable even if they are available nearby. Second, health hotlines have limited ability to follow up with callers to understand the results of their information and advice. Patients do not regularly call to report the results after they complete a course of treatment or act on the hotline's advice. This makes it difficult for hotlines to judge how successful their interventions have been and how to adapt their protocols or recommendations. If anything, the patient is more likely to call back if the advice or prescription has not worked. Another limitation of the study was that it did not really gauge the effectiveness of the health hotlines in improving health outcomes.

There is a need to develop health call center protocols, algorithms and tools for specific scenarios to advise the community on how to self-triage, identify symptoms and call for help or advice. There is a significant need to provide consistent, accurate information, collecting/maintaining structured data to characterize events/responses (situational awareness) and developing capability and capacity to adapt to public health emergencies (technology tools can assist with this).

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