

Strengthening Healthcare Referral Systems In Nigeria Using The Medical Referral Information Management System

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Abstract – The challenges faced by physicians and medical practitioners in referring patients to an appropriate healthcare provider for continuation of care, have been a major discourse in healthcare services. Most referral actions by physicians and practitioners are a mere handover of patients because of the inability of most receiving facilities to provide feedback to the initiating facility. These challenges have often led to delay in commencement of treatment and decreased collaboration between the different levels of healthcare – primary, secondary and tertiary. In this work, a system that enhances the referral process by aiding healthcare providers in establishing a connection with an appropriate healthcare provider for outpatient referrals was developed. The system enables patients establish first contact with a suitable primary healthcare provider. The methodology adopted is Object Oriented Hypermedia Design Methodology; it is one of the first methods to postulate the separation of concerns that defines its various models: requirements, conceptual, navigation, abstract interface and implementation. The system provides interfaces through which a healthcare provider can establish connection with another healthcare provider for purpose of referral. The results obtained using the system includes the recommendation of healthcare providers upon a specialty, care level and location based search request by a health provider. With the developed system, healthcare providers can easily reach nearby or far away healthcare facilities of varying specialties; this improves collaboration in healthcare services and strengthens the referral process.

Keywords – Referral, Healthcare Provider, Health Care Level. Outpatient.

I. INTRODUCTION

It is pertinent to note that an appropriate, robust and sustainable model for improvement in health system performance is essential in order to reverse the declining trends in health and development status. Given the diversity of the health system across Africa, improvement would be dependent upon the convergence of commitment, expertise and resources within the system (Kasege, 2006). Today, one of the major problems of health care is accessibility. Accessible health services are considered to be physically accessible, affordable, appropriate and acceptable (Scrimgeour & Scrimgeour, 2008). Healthcare service includes all services dealing with the diagnosis and treatment of disease, or promotion of health. The World Health Organization (WHO) sees health care in two different dimensions – people centered care and patients-centered care. People-centered care is care that is focused and organized around the health needs and expectations of people and communities, whereas, patient-centered care is commonly understood as focusing on the individual seeking care, vis-à-vis his uniqueness or personal beliefs. There are a number of ways through which healthcare can be improved in Africa, some of the ways are through the deployment of digital technologies and getting the right knowledge, skills and resources where they are needed (Jimenez, 2015). Prior to independence, millions of people on the geographic or social periphery of African countries received either marginal health care or none at all (Skrovseth, 2015). Many years after independence, Nigeria instituted Primary Health Care (PHC) systems, and developed a pyramidal referral model to support the primary health care level. Clinics and health centres were intended to provide local services for uncomplicated cases,

referring patients with more serious conditions to state and teaching hospitals (Ademiluyi & Aluko-Arowolo, 2009). The Primary Health Care is designed to provide general health services for preventive, curative, promotive and rehabilitative purposes to the population; serving as the entry point of the health care system, while the secondary and tertiary health care renders specialized and highly specialized services respectively to patients that are referred from the primary health care facilities. The development of effective patient referral systems is germane to effective management, prognosis and outcomes of ailments in the hospital setting. Referral is a process by which a health worker transfers the responsibility of care temporarily or permanently to another health professional or social worker or to the community" (Akanke, 2016). Referral has also been defined as a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the assistance of a better or differently resourced facility at the same or higher level to assist in, or take over the management of, the client's case (Coovadia et al., 2009). Referral systems have been considered to be an important component of health systems in developing countries since the emergence of primary healthcare (Murray, 2008). In practice, referrals are not only between lower and higher-level facilities (considered to be an integral part of allopathic health systems), but also between primary facilities as well as within hospitals which can be vertical, horizontal or diagonal. The referral system thus ensures a continuum of care as patients are required to seek health services from higher tiers of care in the referral system should there be need to do so. Furthermore, it ensures that patients are dealt with in the right place with effective treatment provided at the affordable cost. Advantages of an effective referral system in literature have been also documented to contribute to high standards of care by limiting over-medicalization, permitting an efficient division of tasks between generalists and specialists, freeing specialists to develop their special skills, and by reducing medical cost. Literature has extensively documented the referral of patients within hospital levels both in Nigeria and abroad. Irrespective of the reasons that range from cheaper hospital out-patient services to improved quality, self-referral has generated economic concerns and is a practice that should be discouraged if its cons outweigh its pros. A recent study conducted in Ilorin found out that only 7.1% were referred from primary health centres to the hospital while 91.9% reported directly without referral. The importance of referral systems has been documented in several studies; however there is a dearth of literature on self-referrals particularly in sub-Saharan Africa notable for self-referrals. This study sought to add to existing body of knowledge by examining patterns of self-referral practices among civil servants. This especially becomes more important in a setting such as Nigeria, a low and middle income country (LMIC), where the health system is not as optimal as that of developed countries. Findings from this study will help to inform health policy decisions geared at strengthening of the health system which comes with improvement on the referral linkage (Okoli, 2017).

II. THEORETICAL BACKGROUND

An effective referral system ensures a close relationship between all levels of the health system and helps to ensure people receive the best possible care closest to home (Abodunrin et al., 2010). It also assists in making cost-effective use of hospitals and primary health care services. Support to health centres and outreach services by experienced staff from the hospital helps build capacity and enhance access to better quality care. A high proportion of clients seen at the outpatient clinics at secondary facilities could be appropriately looked after at primary health care centres at lower overall cost to the client and the health system. A good referral system can help to ensure: patients receive optimal care at the appropriate level, hospital facilities are used optimally and cost-effectively, patients who most need specialist services can access them in a timely way, primary health services are well utilized and their reputation is enhanced. A referral system at all levels is used as a means to facilitate flow of patient referrals among healthcare providers. It is an important activity in any healthcare system for it is a critical component of quality clinical care. If practiced efficiently, it can contribute to high standards of care by improving patient outcomes and decreasing costs through optimal use of medical services. An optimal referral process should be in place for the effectiveness, safety and efficiency of high standard medical care. A referral process is an inherently complex activity, which involves referral decision and referral communication. A referral decision is a clinical decision made by physicians about referral indication (whether referral is needed or not), service identification, and provider selection (Abodunrin et al., 2010). Referral communication deals with subsequent interactions that exist between referring and referred-to providers once a referral decision is made. These two key aspects of a referral process require the transfer and coordination of complex and diverse forms of information distributed between providers. The complexity of the process often causes inefficient referral decisions and referral communication, which in turn affects the quality and cost of care. Hence, it is important to improve both the decision-making as well as communication aspects of the process to enhance the overall outcome of the referral system. Referral does not mean only the forward referrals. Equal importance should be given to the downward referrals as well. If the patients are treated at the first level referral centre they may be referred back to the original primary health care centre with the necessary follow-up advices. This will enhance the trust towards the primary care centers by the patients from

the catchments areas. Effective referral requires clear communications to assure that the patient receives optimal care at each level of the system.

III. METHOD

This section therefore describes the method employed by the researcher at various stages of the software development. We carried out an evaluation using qualitative methods, performing in-depth interviews and use of questionnaires to explore the barriers and challenges faced by the community to the healthcare facilities. The interviews in the community focused on exploring the challenges that the community face in their daily activities and how they go pass these challenges.

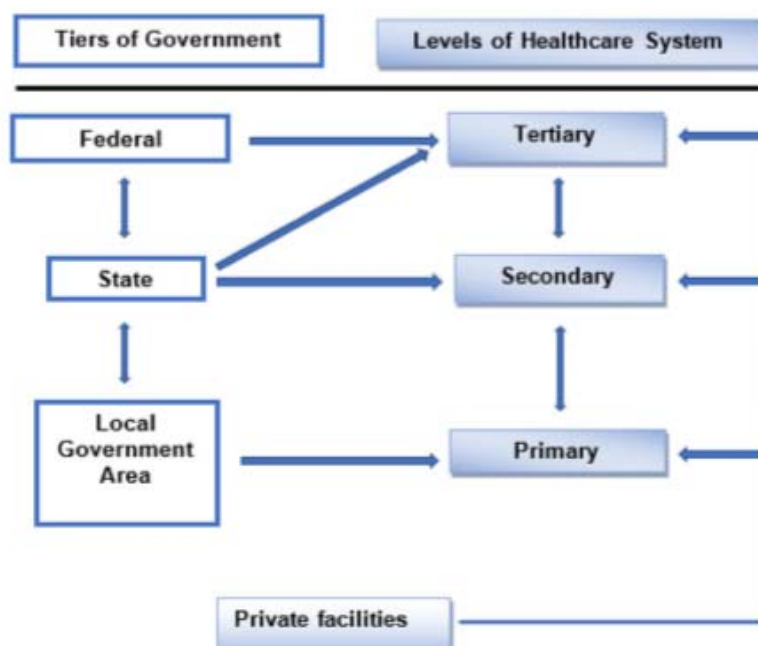


Figure 1: Levels of Healthcare Delivery in Nigeria (Koce, et al., 2019)

IV. REVIEW OF RELATED LITERATURE

Having reviewed the related works, one could see the need for a system that assists patients or prospective patients in locating a primary healthcare facility closest to home. Most Physicians resort to the use of email and telephone to reach specialists or other health care providers; this may limit them to only care givers with whom they have established contact with (Zuchowski et al., 2015).

(Afolaranmi et al., 2018) while assessing primary healthcare centres in Plateau State, North Central Nigeria observed that for an effective referral system, a health care facility must have a list of designated and available catchment facilities it can refer patients to. The need for communication and feedback between healthcare providers was highlighted by (Maizes et al., 2009) - this as presented will improve knowledge sharing among healthcare professionals and ensure that health care referrals are not merely the handover of patients from one hospital to another without due follow up and feedback. Patients bypassing the Primary Health Care (PHC) facilities to self-refer to other levels of health care, and the inability of the referral facilities to readily and easily establish contact for outpatient referral have proven to be a challenge in healthcare. Developing a system that presents a solution to the highlighted challenges is the basis for this work.

(Celso Give sozinhos et al, 2019) a major common facilitator was the existence of referral ships to expedite treatment upon reaching the health facility. Addressing common barriers to and strengthening the efficiency of referral system have the potential to improve health at community level. Improved communication and feedback between involved stakeholders especially strengthening the intermediate role of CHWS and active community engagement will be key to stimulate better use of referral

services and health care facilities. Failure for referred ship. Long distance and opportunity and transport costs were presented as barriers to accessibility and affordability of referral services at the health facility level.

(Oluseye OM et al, 2019) Study assessed the knowledge and utilization of referral system among health care workers in selected primary health care center.

Sixty-six (75.0%) of the respondents indicated that there are three levels of health care system. Sixty-two (93.2%) health care workers knew that referral system can be from lower to higher level of care and 61 (69.3%) knew that referral system can be from higher to lower level of care. Only 21 (23.9%) of the respondents refer patients frequently and 66 (75.1%) of them mostly refer to secondary health care facility. Factors identified by respondents as influencing utilization of referral system included distance of one facility to another 74 (84.1%) social support 71 (80.7%) and availability of referral forms 70 (79.6%). The implementation of the process was poor. It is vital that future studies should explore identified factors since a functional referral system is vital for effective health care system.

(Technical working guidance, 2020) proposed a strategic directions for adapting primary health care to better address COVID-19. A suite of technical guidance papers developed by the WHO regional office for Europe to provide practical information and resources for decision makers on measures to strengthen the health system response to COVID-19.

(Anil kumar Gupta et al, 2017) Proposed a health system strengthening focusing on referrals. The referral system makes cost effective utilization of health care. Here it ensures better quality care in all levels.

(Afolaranmi et al., 2018). An effective referral system ensures a close relationship between all levels of the health system and helps to ensure patients receive the best possible care close to home. However, there appears to be a weak link of referral system in chain of continuity of care across the levels of health care in Nigeria placing huge demands on secondary and tertiary levels of care for health care service provision. This weakened implementation of referral system in Nigeria has been corroborated by finding of a survey conducted in Ilorin, North Central Nigeria where only 7.1% of all consultations in a tertiary health institution were referred, resulting in overwhelming demands for health care with health problems that can be handled and managed at the lower levels of health care.

V. ANALYSIS OF THE PROPOSED SYSTEM

The proposed Medical Referral Information Management System (MRIMS) will serve as a one stop system for medical referrals, particularly for hospitals in Nigeria. The framework by capacity will have the registry of Primary Health Care offices and their areas - this module of the framework will be available to the general population for conceivable self-reference by patients. The MRIMS will empower doctors pre-educate and impart reference intends to target getting clinics or clinical offices. By choosing a consideration level (Primary, Secondary or Tertiary), area and claim to fame, a doctor can get suggestions of clinics for conceivable reference. The doctor can send reference reports and get input from the getting office. The Physicians can get to both the essential, optional and tertiary consideration office suppliers enlisted with the framework, notwithstanding, doctors or specialists can just utilize the framework as representatives working with a clinical office enrolled in the framework. The MRIMS will be intended to permit clinics to enroll and be important for the framework, enlisted medical clinics or clinical offices will upon confirmation be recommendable to other medical care suppliers in the framework. Figure 2 shows the information stream between the framework segments.

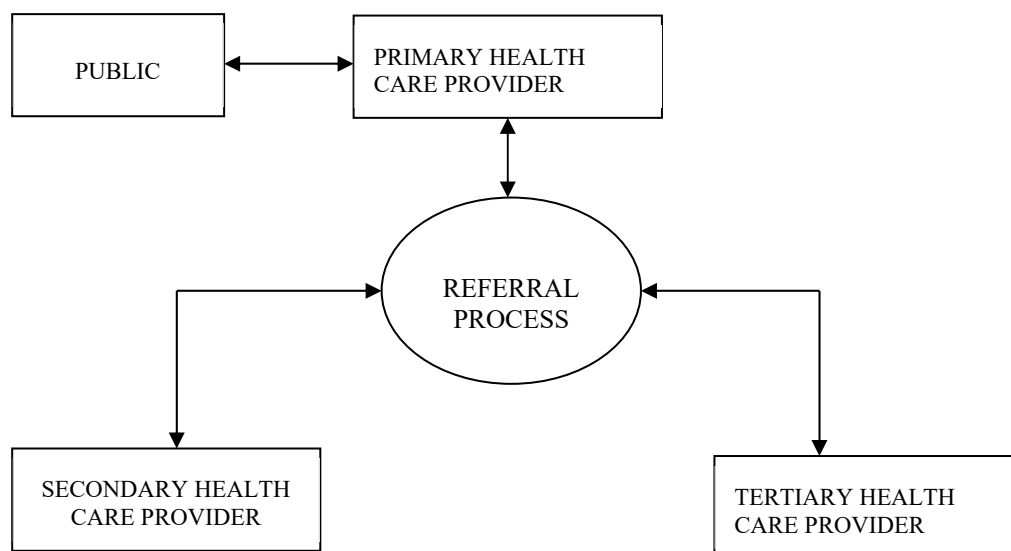


Figure 2: Data Flow Diagram of the Proposed System.

3.1 Use case model of the proposed system

The use case model describes how different types of users interact with the system to solve a problem. As such, it describes the goals of the users, the interactions between the users and the system, and the required behavior of the system in satisfying these goals. A use case model consists of a number of model elements. The most important model elements are: use cases, actors and the relationships between them. This is shown in figure 4.

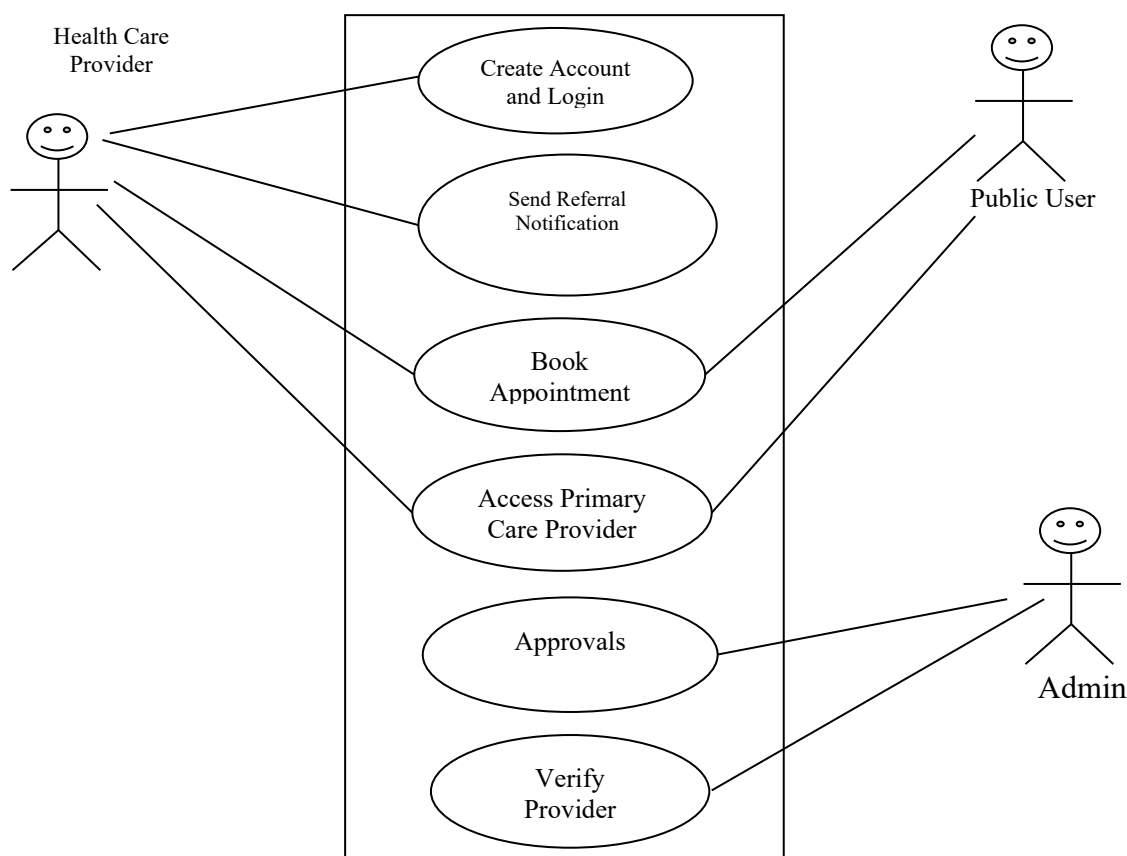


Figure 4: Use case diagram of the proposed system

VI. RESULTS AND DISCUSSION

The objective for designing the Medical Referral Information Management System is to build a system that will make the medical referral process more efficient and effective. The system will achieve this by recommending hospitals to patients and physicians, based on location, care level and specialty. The User Section of the system comprises of three major modules, namely Provider Search module, Health Care Provider module and Messaging module. The Provider Search module allows the public and the physician to find primary health providers and specialists operating within a location; the Health Care Provider Module allows the user to view providers' information, be it Primary, Secondary or Tertiary Care Provider while the messaging module enables public-provider and provider-provider interaction. The system works with a MySQL database system. Input to the system can be made through text boxes and selection boxes. The visitor, the specialist and the admin can make inputs into the system; however there is a symptom selection module that allows the visitor/patient to input his location, health problem category and symptom. The system now uses the combination of these to filter the list of specialist based the selections of the visitor/patient. The system empowers the admin to approve provider's registrations and verify providers – this ensures that only verified providers are visible to the public.

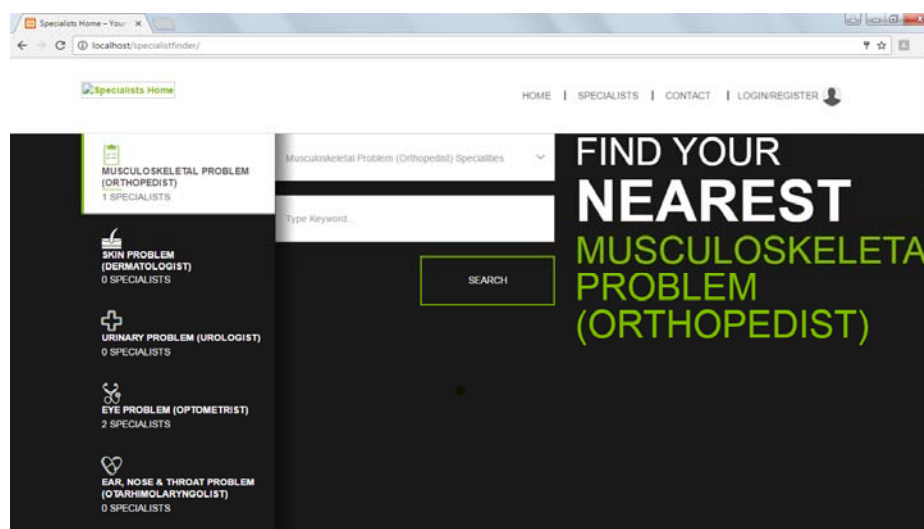


Figure 7: Home Page

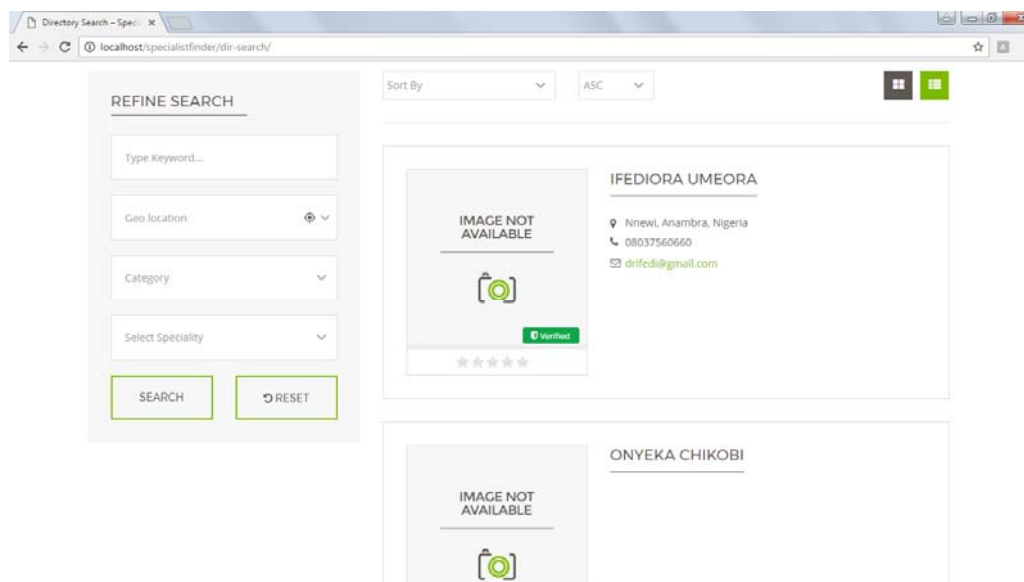


Figure 8: Symptom Search Panel

VII. CONCLUSION

The desire to improve accessibility and digital inclusiveness in healthcare systems has motivated this work. We have through this work provided a platform that aids in solving an important societal problem. Noting that most referrals are a mere handover of patients, where there are hardly avenues for feedback. This work mitigates the difficulties healthcare providers face during referrals. With the developed system, healthcare providers can easily establish connection with near-by or far away healthcare facilities of varying specialties; this improves collaboration in healthcare services and strengthens the referral process.

RECOMMENDATION

The work presents the Medical Referral Information Management System, a system that improves the efficiency of the referral process in healthcare systems. The system by function aids patients in establishing first contact with primary health care providers. It improves the efficiency of the healthcare referral process by serving as a platform through which healthcare providers of different levels of care can refer patients, interact and collaborate with each other. The system achieves this by recommending healthcare facilities to patients and providers based on location, care level and specialty, allows providers to create catchment facilities they may often refer to and provide an effective messaging and communication platform for referral and feedback. This work is recommended for health practitioners, government health agencies and the general public. Another area which requires further research is the development of a GPS driven mobile integrated referral solution.

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