E-Medical Consultation for Diagnosis and Treatment of Hypertension in Pregnancy: an Opportunity to achieve the 5th Millennium Development Goal in Kenya

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ABSTRACT

This study sought to establish the challenges that the Reproductive Health Division (High Risk Pregnancy Clinic) at Moi Teaching and Referral Hospital based in Eldoret city, one of the two referral hospitals in Kenya, faces in adopting e-medical consultation as a way of improving maternal healthcare for patients with hypertension in pregnancy and reducing maternal deaths. In this paper, an outline of the strategies and pillars that the Clinic needs to adopt to embrace the use of e-medical consultation for the diagnosis, treatment and management of hypertension in pregnancy is presented. The survey conducted established that the division is still lagging behind and has not adopted the use of e-health, especially in the consultation sessions between the doctors and patients. The outlined strategies when implemented will help steer the Reproductive Health Division (High Risk Pregnancy Clinic) towards making healthcare services available in an efficient and effective way to expectant women with the condition. The model could be adopted to extend the same to less endowed areas around the globe, where specialist: patient ratio is low.

Keywords: e-Health, e-Medical Consultation, Millennium Development Goals (MDGs), Information and Communication Technology (ICT)

1. INTRODUCTION

Three of the eight millennium development Goals (MDGs) are health goals, they are Goal 4: Reduce child mortality; Goal 5: Improve maternal health; and Goal 6: Combat HIV/AIDS, malaria and other diseases.[1] The 5th Millennium Development Goal to reduce maternal mortality by 75% during the period 1990-2015, is by far the least MDG on track to be fulfilled in Kenya, with the highest maternal death rates in the world at 488 per 100,000 live births,[2] with hypertension in pregnancy, referring to a blood pressure of greater than or equal to 140 mm Hg systolic and greater than 90 mm Hg diastolic which can starts before pregnancy, [3] or develops after the second half of pregnancy,[4] causing 18% of these deaths.[5] The use of electronic tools in delivering health care is rapidly emerging as an international priority in nations at all levels of development.[6] Achieving the international Millennium Development Goals, as well as the targets set in Kenya's Economic Recovery Strategy, is among the strongest commitments of the Ministry of Health, in Kenya, as a way of realizing the national vision of providing accessible, affordable and quality health care for all Kenyans, in particular the poor. The strategy isolates five key areas of intervention forming a five pillar conceptual framework approach to address the health care sector challenges as follows: Telemedicine; Health Information Systems; Information for citizens; Health; and eLearning.[7]

The government of Kenya has found it crucial to revitalize the health sector by improving service delivery, ensuring community participation, and enhancing cooperation, collaboration and teamwork among the various departments within the Ministry, with the districts and provinces, and with all actors having a stake

in the health sector.[8] As result, the country's first National e-Health Strategy aimed at ensuring health information is provided to the right person at the right place and time to support quality and efficient healthcare was launched by the Kenyan government in the year 2011. [8] Developing efficient, accessible, equitable, secure and consumer friendly health care services enabled by ICT, is the vision of the strategy. It also outlines a mission which is to promote and deliver efficient healthcare services to Kenyans and consumers beyond our borders, using Information and Communication Technology (ICT).[8]

2. CURRENT SITUATION

Healthcare is the 'heartbeat of a nation', yet, the challenges facing healthcare services in developing countries have manifested themselves in poor and declining health indicators. In Kenya for example, there is a high infant mortality rate of 74/1000 live births, high maternal mortality of 488/100,000 lives, low life expectancy of52 years, high prevalence of HIV/AIDS at 7.4%, and a silent epidemic of communicable diseases.[7] The World Health Organization has estimated that high blood pressure causes one in every eight deaths, making hypertension the third leading killer in the world.[5] It is sometimes referred to as '*a silent killer*' [9], mainly because it has no warning signs and the symptoms largely remain hidden until it is too late in most cases.[10] The doctor-patient ratio in Kenya, currently stands at 1:6,633 in the urban areas, while in the rural areas it is 1: 8,500[11]! The lack of specialist doctors in rural areas causes that many patients be transferred or referred, either from the district hospitals or health facilities in rural or remote areas, to the Reproductive Health Division of Moi Teaching and Referral Hospital for diagnosis and treatment. The Division has fifteen (15) specialist obstetricians attending to the High Risk pregnancy clinic for two (2) days in a week, specified as Mondays and Thursdays, yet out of the twenty (20) expectant women visiting the Division for antenatal care, every day, at least two (2) are diagnosed with hypertension in pregnancy. E-medical consultations, when adopted can be used to respond to an increasing demand for care by offering support on health related requests, [12] whilst providing a high quality and more convenient service for patients with hypertension in pregnancy.

3. RESEARCH METHODOLOGY

The study was carried out using hybrid of qualitative and quantitative research methodology at the Reproductive Health Division of MTRH, which was chosen using purposive sampling. The main objective of the study was to find out the challenges faced by the medical staff at MTRH in diagnosing and treatment of hypertension in pregnancy, and adoption of e-medical consultation for use in the diagnosis and treatment of hypertension in pregnancy; To examine the medical protocols in place at the MTRH; A sample population, which included: specialist obstetricians, registrars, medical officer interns, clinical officers, nurses and expectant women with hypertension in pregnancy, were chosen using stratified and simple random sampling. The data collection instruments used included: interviews, analysis of documents, observation, and questionnaires.

4. WHY E-MEDICAL CONSULTATION

Consultation is the dynamic process of dialogue between individuals or groups, based upon a genuine exchange of views, and normally with the objective of influencing decisions, policies or programs of action,[13] at the core of the consultative process lies the provision of information and the establishment and maintenance of channels of communication between a doctor and patients. The broad term e-health that encompasses e-medical consultation refers to the application of ICTs, to improve health by addressing challenges ranging from enhancing preventative care to reducing pandemics.[14] E-medical consultation activities at global level fall into two broad categories, namely: access to reliable, high quality health information for professionals and for the general public; and use of information and communication technologies to strengthen various aspects of country health systems, such as eLearning for development of human resources and support for delivery of healthcare services.[15] Dr. Saeed Samnakay[1] argues that; "Technology has not only simplified our lives, but also presented us with a unique chance to share knowledge and grow each other's individual and collective capacity in our service to humanity."

Following the path of comprehensive e-health service provision in Kenya, Agha Khan University Hospital in Nairobi has launched the first ever surgery, in Kenya, using the Video Conferencing Surgery (VCS) technology, with guidance from specialists in India.[15] E-Medical Consultation has the potential to increase the

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efficiency of health systems, and to improve access, especially in remote areas, or for marginalized or excluded populations, or people with disabilities and the elderly. E-medical consultation can also be used to improve service quality and can reduce the cost of healthcare delivery by reducing redundancy and duplication and introducing economies of scale through Information Sharing. [16, 17]

5. STRATEGIES PROPOSED FOR THE ADOPTION AND USE OF E-MEDICAL CONSULTATION

The key challenges the Division need to address, if e-medical consultation is to be adopted, include: lack of enabling policy environment; limited awareness on eHealth and related issues; weak ICT infrastructure and services; inadequate human capacity; inadequate financial resources; and weak monitoring and evaluation systems. The strategies to be adopted to address the challenges mentioned above are as follows:

5.1 Develop and adopt an e-Health (e-medical consultation) policy

E-health's ability to transcend sociopolitical boundaries holds the potential to create a borderless world for health systems and health care delivery. But the policy needed to guide e-health development is limited and just now emerging in developed countries.[18] E-health policy is defined as a set of statements, directives, regulations, laws, and judicial interpretations that direct and manage the life cycle of e-health.[19] The most favorable approach to the implementation of e-health at the national level is to have a framework of strategic plans and policies which lay the foundations for development. [20] The e-health policy is concerned with solutions that support capacity building and provide services that improve health outcomes. If the e-health policy is developed appropriately, it can help clear a path for sound adoption of technological solutions and enable countries with similar challenges to share resources and lessons learned across international borders. [21] Unless an e-health enabling policy is in place, it will be difficult for an average Kenyan patient to benefit from e-medical consultation.[22] Strategic plans and policies should protect citizens, promote equity, observe cultural and linguistic issues in cyberspace, ensure interoperability (the ability of different technology systems to work together), and allow for capacity development so that all citizens can access e-health solutions.[20]

5.2 Create e-medical consultation awareness

Policy-makers, health authorities and health practitioners are not fully aware of the potential benefits of the use of ICT in health. Describing the value of eHealth in healthcare terms is crucial for creating awareness of how technology can improve patient safety, quality and efficiency in healthcare.[23]This can be done through awareness seminars and workshops aimed at promoting the use of ICT to facilitate the provision of quality, equitable and sustainable health services. This should be done to sensitize Ministry of Health officials and key stakeholders in the hospital on the application of ICT in health care delivery. This will help make them ready and prepared to adopt and embrace e-health in healthcare service delivery.

5.3 Strengthen ICT infrastructure and services within the health sector

There is little investment in ICTs for health even in most developing countries. Very few government-run health services have properly functioning ICTs within them [26]. The Reproductive Health Division, however, has so far made a step towards digitizing patients' records management [27]. However, in order to start e-medical consultation, the division should ensure that the right ICT infrastructure are in place, up to standard and well maintained. This includes setting up the e-medical consultation centre, to provide healthcare services to patients at some location separate from the Division that has high end computers, satellite links, dedicated line connections, interactive television systems and very good Internet connections.

5.4 Develop e-medical consultation human capacity

Capacity building is broadly defined by the United Nations Development Programme (UNDP) as the creation of an enabling environment with appropriate policy and legal frameworks, institutional development, including community participation, human resources development and strengthening of managerial systems. [23] E-health training should be included in continuing education programmes for health workers and people in the medical fraternity and the use of ICT based learning should also be used in sharing medical information. ICT-facilitated learning and information sharing can play an important role in medical education as well as in increasing general health awareness, in particular by creating continuous medical education and increasing access to learning opportunities in remote areas and creating relevant course content which is locally applicable. Accessibility and usability are key elements and creating relevant

content is a precondition for ICTs to have a positive impact. Using ICTs for health education should be reflected in and supported by policy guidelines. [24] Forming or having a national and international network of eHealth informatics (sharing medical knowledge) can also be helpful in training.

5.5 Mobilize financial resources for eHealth

The Hospital needs to make the necessary investments in ICT infrastructure and services in the health sector, using domestic and external financing. This can be achieved by adopting various strategies to improve financial resource mobilization through necessary investment in ICT infrastructure and services in the health sector; looking for International partners and donors to support e-health initiatives and efforts. In as much as MTRH already have international partners, still no initiatives have been made towards adopting e-medical consultation within the Division. To get more funding from the Ministry of Health (MoH), for the purpose of e-health, the hospital would need to convince and demonstrate to the MoH, the benefits and it importance of e-health, if MDG number five is to be actualized and not just referred to as 'dream yet to be actualized'. This can be done by justifying their location and having convincing personnel who can justify for an increase in their allocation of finances.. The Division could also possibly come up with other ways of generating its own money by engaging in income generating activities.

5.6 Have appropriate e-medical consultation Information Systems

Every information system developed must have a purpose. An information system aims to provide relevant information to users in the required fashion: that is at the right time, at the appropriate level of detail, and accurate enough for the users who are presented with that information.[25] The Division should work towards outsourcing the development of appropriate e-medical consultation Information Systems from the universities around. For example, the Division may outsource the development and maintenance of these systems from Moi University through college of medicine in collaboration with Information Technology departments in Moi University. The other alternative would be to purchase relevant medical information systems that have information on the diagnosis, treatment and management of hypertension in pregnancy and make this information available to medical personnel at all times. The information systems should be maintained regularly to ensure that the diagnosis, treatment and management of hypertension in pregnancy information remain as relevant and up to date as possible.

6. PROPOSED PLAN OF ACTION

In order for the above strategies to work, there has to be a concrete plan of action of how each of the above is to be executed and the possible time frame for each step. The authors suggest the following eight step plan of action:

Activity	Duration (Time in months)	Expected output
Step 1: Put together an E-health policy development team (comprising of competent members both in the TCT field, in the medical field and legal field). If possible the members should be interviewed to know their potential, strength, weaknesses etc.	1-2 months	A competent e-health policy development team
Step 2: Develop an e-health policy (involves a lot of consultation with members of different fraternities such as IT, medicine, lawyers, security etc)	2-4months	A complete eHealth policy
Step 3: Put together an eHealth championing team (one that will drive the eHealth agenda)	1-2months	eHealth champions
Step 4: Create eHealth awareness (This will be the duty of the eHealth champions to make sure that people get to know what eHealth is, its benefits and opportunities it brings along). -This will entail organizing awareness seminars and workshops, doing posters and banners that have eHealth messages on them	1-3months	- An eHealth aware population -An advertisement on eHealth -Invitation sent out to speakers from countries that are ahead in eHealth and related issues to give talks in the seminars and workshops. -Availing copies of the eHealth policy to the different departments or sections within the Division

Step 5: Mobilize financial resources for eHealth (This would mean writing proposals to possible donors to fund the eHealth project, the government, starting and income generation activity)	2-6months	Enough funds to start the project and sustain it even after the donors have withdrawn their funds. These funds would be used to purchase the necessary equipment, build the e-medical consultation center, train and hire the e-doctors and e-nurses
Step 6: Develop e-medical consultation human capacity (train nurses, doctors, clinical officers, medical officers etc, through a formal education system that offers training on eHealth)	12 months or more (Depending on the duration of training being undertaken)	e-medical consultation team (trained in eHealth and e-medical consultation and know how to do it i.e. a hand-on team to run the e-medical consultation centre)
Step 7: Have appropriate e-medical consultation Information Systems. This would entail: outsourcing the development of appropriate e-medical consultation Information Systems from the universities around; and outsourcing the maintenance of the systems; or purchasing if the solution is not available locally	3-6months	A complete e-medical consultation information system that has been tested and is running. One that is easy to use.

7. CONCLUSION

The role of eHealth and informatics in addressing serious shortages of qualified health service professionals and in building health system capacity cannot and should never be underestimated.This paper outlined the strategies and pillars that the of the Moi Teaching and Referral Hospital need to adopt, streamline or change in embracing the use of e-medical consultation for the diagnosis, treatment and management of hypertension in pregnancy. Application of e-health could contribute immensely to fostering positive lifestyle changes to prevent maternal deaths caused by wrong or late diagnosis and treatment of hypertension in pregnancy. We anticipate that the Reproductive Health Division will strive to become a world leader in using, researching and training in e-health.

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