TELE-NURSING AND NURSING INFORMATICS IN DEVELOPING COUNTRIES: A CASE STUDY OF NIGERIA.

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Introduction

The increasing need to improve health care quality, expand access to affordable care and reduce health care cost are the driving forces for the unprecedented success of Tele-medicine in the developing countries. The need for information communication technology coordination and utilization are more pressing in Nigeria because of regions of poor topography, inaccessible road network with poor health indices. Tele-medicine has been defined as the use of Tele-communications to provide medical information and services at a distance. (Perednia & Allen, 1995)
However, the introduction of Telemedicine technology in health care delivery system in the developing countries will be a great potential to extend medical care efficiently to over 40% of the population where health care is almost non-existent. It requires finance, investment and training, secondly health care budget is very limited in all developing countries.
The peculiarity of developing countries. The developing countries have their peculiarities in structure, development and function. In Nigeria, the topography shows a country with high proportion outskirts, under served, under privileged rural population, with poor access road network, disparate distribution of health facilities and health personnel. About 80% of the population lives in the outskirt with about 80% of health facilities and skilled personnel living in the urban areas.
These have led to rural-urban drift, general lack of specialist (skilled personnel) doctors, nurses in the remote areas. Tele-medicine/Tele-nursing will serve as a bridge to fill in this gap. The disease burden is high with Hiv/Aids, multi-drug resistant tuberculosis, malaria on the increase with non motivated health team that seeks better remuneration, leading to brain drain.
Challenges of health care delivery in Nigeria a case of maternal mortality.
Maternal mortality is a daunting challenge to Nigeria. Maternal death is the death of a woman while pregnant, in labour or within 42 days of the termination of the pregnancy from any cause related to or aggravated by pregnancy or its management (ICD-10). The maternal mortality ratio in Nigeria is estimated to be 800: 100,000 live births. (FMOH 2005) However, wide variations exist across the geo-political zones, with the North-East zone having the highest maternal mortality ratio of 1,549:100,000 live births, Compared to 165:100,000 (FMOH 2007) live births in the south-west zone; an almost 10 fold difference.
There is also marked urban-rural variation in maternal mortality: 351:100,000 (urban) to 828:100,000 (rural), (FMOH 2007). The following statistics highlight the peculiar challenges which an effective strategy must address.

About 15% and 46% of rural and urban dwellers respectively do not go for antenatal care while about 44% deliveries were attended to by skilled health care personnel. About 2 million women of reproductive age do not survive pregnancy or childbirths. (Mohamned, 2009).
Target of the work
The target of the work is based on the Bamako declaration of May 2001 which envisages reduction of maternal mortality by 50%.
We also target to:
Improve access to antenatal care by 60%
Improve attendance to deliveries by skilled healthcare professionals by 70% within 2 years.
The enabling technology: mHealth Maternal services in Federal Medical Centre Owerri. The mHealth maternal services is aimed at the utilization of the two strategies that are internationally recognised for the reduction of maternal mortality. These are Skilled attendance at pregnancy and deliveries Timely access to emergency obstetric care for women with complication during labour. Adoption of mHealth platform as an alternative, is to utilize these strategies and remove the three phases of delays that endanger the lives of pregnant women and their babies (fetus)
The three delays that endanger the life of a pregnant woman. These are in phases (Galadanci, 2008).

Phase 1 delay:
This accounts for as much as 30-40% of maternal mortality.
Lack of information and adequate knowledge about signs of complications of pregnancy and danger signals during labour.
Cultural practices that restrict women from seeking health care promptly and effectively.

Accessibility
Quality of care
Phase 2 delay
Inability to access health facilities
Poor road and communication network
Poor referral system
Poor terrain
Poor community support
Phase 3 delay
Delay about arriving and receiving care at the health facility
Inadequate skilled personnel
Inadequate equipment supplies
Lack of blood bank
Lack of continuous medical training
Poor attitude of healthcare workers
Lack of basic amenities e.g. water and electricity.
Tele-nursing and nursing informatics initiative as practiced in telemedicine unit of Federal Medical Centre (F.M.C) Owerri, Imo State, Nigeria.

Federal Medical Centre Owerri, Imo State, Nigeria, is one of the six centres selected for the pilot telemedicine project in the country; initiated by National Space Research Development Agency (NASRDA) in collaboration with Federal Ministry of Health. The project is currently networking two university teaching hospitals, six federal medical centres and one fully equipped mobile clinic to provide real time healthcare delivery (Plasidus, 2007).
The fixed and mobile hospitals are equipped with VSAT equipment, video equipments and telemedicine equipments for real time Tele-diagnosing and Tele-consulting. There is a network operating centre in Abuja for management of bandwidth among the nine service locations. The project was flagged off on 17th January 2008 and NIGCOMSAT 1, got missing in the orbit; which brought down the telemedicine services.
However; the unit developed mHealth initiative with one of the eight maternity centres in remote area of umuneke in Ngog ukpalla local government area as a pilot scheme to improve maternal health and reduce maternal mortality. This very important health facility is managed by only one trained nurse, two community health technicians and a visiting medical officer with maternal mortality rate of 18%.

mHealth maternal services in F.M.C Owerri utilizes the 24hours routine call and emergency services of the obstetrics and gynaecological department of the facility, manual vacuum aspiration (MVA) unit and the telemedicine unit.
• One of the services is the provision of professional information, education and counselling to improve maternal health through mHealth using GSM (global system for mobile communication)

• Second is the provision of emergency services with MVA unit attached to the emergency department of the facility primarily to render maternal services. The facility now serves as a centre for monitoring and emergency assistance to reduce maternal mortality based on telephone transmission of information (GSM)
User friendly centre

The good thing about mHealth maternal services in Federal Medical Centre Owerri is that it is not expensive. Already health care personnel have phone lines. It is run at no cost to the patient as of today.
Initiative

Project structure
The initiative is designed with input from nursing informatics and Tele-nursing Informatics is a science that combined a domain science, computer science, information science and cognitive science (Yoder-wise, 2003)

The first model of nursing informatics was developed Granes, Amos, Hucther, Lange & Thompson (1995) after Granes & corcoran (1989). The core of this model is the transformation of data into information and then into knowledge (Yoda-wise 2003) this transformation occurs to facilitate decision making, new discoveries and the creation of designs.
Nursing informatics conceptual model (Granes, R)
Amos, L.K, Hucther, S, Lange, L.L, & Thompson C13
(1995) Description of a graduate program in clinical Nursing Informatics: Computers in Nursing 13(2) 60-70
Nursing profession is a knowledge working profession, predominantly dealing with data. The nurses generate a lot of data in the course of their routine work. New data generate on daily basis, per shift and per hour per individual client. However, how is this data analysed into information that will transcend into knowledge that will facilitate decisions, designs and new discoveries.

Tele-nursing is the use of Tele-communication for monitoring, care delivery service management of client at a distance. Tele-nursing refers to the use of tele-communication and information technology for providing nursing services in health care whenever a large physical distance exist between patient and nurse or between any number of nurses.

http://www.en.wikipedia.org/wiki/telenursing
Tele-medicine unit of F.M.C OWERRRI conducted a 6 months research work at the umuneke maternity in Ngor okpalla on the effectiveness of utilization of mHealth in improving maternal health on pregnant women.

Objectives
To reduce maternal morbidity/mortality
To improve the number of deliveries attended to by skill health workers.
To assess the effectiveness of mHealth and patient outcomes and the quality of care delivered.
Technology utilized: Biomedical technology m-health monitoring. Biomedical technology involves the use of equipments in the clinical setting and for diagnosis, physiological monitoring, testing or administering therapies to patients. (Yoder-Wise, 2003). In biomedical technology with emphasis on monitoring of the fetal-maternal condition, fetal heart rate, maternal blood pressure, health education on signs of labour etc. which will be sent to the referral site via mHeath – text messages.
The group comprises
1 consultant obstetrician
1 medical officer
2 public health nurses/midwives.
1 Public health educator
2 community health technicians
1 lecturer II
1 health management information system officer / statistician
The initiative is divided into five steps

Step 1 - literacy management: education of the health workers on the various uses of the mobile phone facilities on how to send text messages

Step 2 – data gathering: relating to the improvement of maternal health using Nursing Minimum Data Set (NMDS) developed by Werley and Lange (1988)
Element of the NMDS

Patient demography elements
Personal identification – Name, Age
Date of birth, Sex, Race and ethnicity Residency / Permanent Home Address
Unique phone number of the client.

Nursing Care Elements
Nursing assessment, nursing diagnosis, nursing intervention, nursing outcome intensity of nursing care.

Service Elements
Unique facility or service agency number
Unique health record number of the patient
Unique phone number of the principal registered nurse provider
Record of admissions / discharges
Disposition of patient
Step 3 Analyses of data, formation of information and selection of cases.

Step 4 Analyses of the selected cases' information leading to knowledge. Transfer of information to referral centres, health education, information of signs of labour / danger signals

Step 5 Decision on movement of client: early referral before expected date of delivery (EDD)

*trial of labour / specialist monitoring/mHealth monitoring
Findings

Findings revealed that within the period under review, 78 pregnant women were booked, two with high parity and an elderly primip were referred, while six were placed on monitoring with mHealth platform (GSM). In all, we had no maternal death. 100% safe delivery. Only 3.84% were referred and they had safe delivery.
Cost benefit analysis
What are the benefits coming from the introduction of mhealth services in FMC OWERRI.

Economic benefits:

Avoid unnecessary transportation to tertiary care centre
Reduce the hardship / (physical and economic) associated with travel for patients or obstetrician
Ambulance services of tertiary institution utilized at no cost to the patient if the need arises
Travel cost is saved.
Time is saved.
Social benefits:-
Access to maternal services as the need arises.
Reduction of the number of maternal death.
Effective and efficient utilization of limited healthcare personnel.

Health benefits:-
Facilitate immediate exchange of information with health maternity centres.
Enable early diagnosis, intervention and treatment of selected and emergency obstetric cases.
Facilitate early referral, thereby strengthening the weak referral system in the country.
Enable utilization of limited health care personnel
Allow patient to remain in their communities and maintain a normal lifestyle.
Price of mHealth
The cost of medical services in F.M.C Owerri is not free.
Consultation is N 100= booking is N2,150..
However, mHealth maternal services is at pilot-project state and so, at the originating site, all services are free. Only those referred will pay. Efforts are being made to involve the Local Government Authority to pay for them.
Time is a critical factor for patient, to save the life of mother and baby, timely intervention is necessary to save life.
Conclusion

Maternal death will continue to occur unless we have strategies in place whereby when a woman is in labour, she has access to a skilled attendant, well equipped and competent facility. (Galadanci 2008)

There is tremendous need for the use of mHealth as a platform in the coordination, tracking of patients, monitoring of antenatal patient and have constant link with pregnant woman, for education and communication with them. With the increase in the use of mobile phone in the country, mHealth proved to be an alternative platform to reduce maternal mortality rate, improve attendance by skilled healthcare personnel.
As earlier said, Nursing profession is a knowledge working profession, predominantly dealing with data (Yoder-wise 2003) the nurses generate a lot of data in the course of their routine work. The use of mHealth will enhance the learning of model of nursing informatics which will go a long way in improving the Tele-nursing in other aspects of health care services. Thank you for listening.
References
Federal Ministry Of Health (FMOH) Abuja (2007): *integrated maternal, newborn and child health strategy*

