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COMPARATIVE STUDY OF QUALITIES OF SACHET AND BOTTLE WATER SOLD ON THE STREETS OF ABUJA, NIGERIA

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ABSTRACT

A total of one hundred (100) brands of sachets and one hundred (100) brands of bottle water samples were collected from different locations in Abuja Metropolis and were analyzed physico-chemically and microbiologically.

The total count of most of the sachet water samples ranges between 0.32 x 102 and 1.95 x 102 CFU/ml, exceeding the limit of 1.0 x 102 CFU/ml. The MPN of coliform counts ranged from 1 to 16 cfu /100 ml of sample. Total number of isolates 502, 201 (40.04%) Escherichia coli, 52 (10.36%) Streptococcus faecalis, 50(9.36%) Pseudomonas aeruginosa and 199 (39.64%) Klebsiella Species. The dominant bacteria isolates were Escherichia coli, Streptococcus faecalis, Pseudomonas aeruginosa and Klebsiella Species.

The entire bottle water samples analyzed showed no bacterial growth. Bacteriological analysis showed that 10/100 (10%) of the samples of sachet water tested showed positive coliform counts. These contaminants could be as a result of improper sterilization of the water before packaging or contamination due to poor handling during production, transportation or sales of such products. There were no traces of Heavy metals and all other chemical parameters were within permissible limits.

KEYWORDS

Unsafe Water, TSIA Test, Packaged water in Abuja, Water-borne diseases, NAFDAC, Oxidase Test.

INTRODUCTION

Safe and potable water supplies in urban centers in Nigeria are still inadequate in spite of over five decades of independence and several efforts from various governments.

In many developing countries, availability of water has become a critical and urgent problem and it is a matter of great concern to families and communities depending on Non-public water supply system (Okonko et al.,2008). Increase in human population has exerted an enormous pressure on the provision of safe drinking water in developing countries (Umeh et al., 2005). Towards the Millennium Development Goals – Action for Water and Environmental Sanitation is timely in the light of the problem of poor availability and access to good drinking water in many countries of the
world including Nigeria. “About one – fifth of the world’s population lack access to safe drinking water, and about half lack adequate sanitation. About 40 percent of the world’s population lives in countries with moderate to high water stress.

By 2025, this figure could rise to 50 percent. Yet, with the help of policy and legal reform, international cooperation, community and private sector participation, technical innovation – there are encouraging signs that the crisis could be averted. The connectivity between poverty, hunger, availability, affordability and access to drinking water to sustainable development is succinctly described by the goals of the millennium declaration. “The links between water, health and poverty are numerous and complex.

Access to safe water affects adequate sanitation which in turn drives the risk of water borne diseases especially in poor urban communities. The urban poor often spend up to 10 - 20 times more on water from vendors than piped water.

The inability of Government to consistently provide adequate water contributed to the proliferation of the so-called ‘pure water’ manufacture in Nigeria. The provision of drinking water that is not only safe, but tasteless, odourless and clean in appearance is top priority in any country that cares for good health, and poverty alleviation towards sustainable development. consumers cannot by themselves ascertain the quality of drinking water.

Naturally, water that appears dirty, discoloured, smelly or with unpleasant taste will be treated with grave suspicion by consumers, thus causing them to find an alternative. However, appearance and other organoleptic properties are not all there is to Water Quality Assurance (Akunyili, 2003).Unsafe water is a global public health threat, placing persons at risk for a host of diarrheal and other diseases as well as chemical intoxication(Hughes and Koplan, 2005). Unsanitary water has particularly devastating effects on young children in the developing world.

Each year, more than 2 million persons, mostly children less than 5 years of age, die of diarrhea disease (Kosek et al., 2003; Parashar et al., 2003). For children in this age group, diarrheal disease accounted for 17% of all death from 2000 to 2003(WHO, 2005), ranking third among causes of death, after neonatal causes and acute respiratory infections. Nearly 90% of diarrheal-related deaths have been attributed to unsafe or inadequate water supplies and sanitation (WHO, 2004) conditions affecting a large part of the world’s population (Hughes and Koplan, 2005).

An estimated 1.1 billion persons (one sixth of the world’s population) lack access to clean water and 2.6 billion to adequate sanitation (WHO, 2005; Hughes and Koplan, 2005). The principal objectives of municipal water are the production and the distribution of safe water that is fit for human consumption (Lamikanra, 1999; Okonko et al, 2008).

Abuja the Federal capital city of Nigeria is situated at the center of the map of Nigeria, bordered by Nasarawa, Niger, Kaduna and Kogi states. According to an official of Abuja water Board, the portable water scarcity has been a perennial problem of the local indigene. Worst hit areas are the core and inner areas like Abaji, Gwagwalada, Kuje, Bwari and others. Hence, the inhabitants mostly women and children have resorted to sourcing drinking water from dug wells, unprotected and protected springs, brooks and harvested rainwater throughout the seasons.(Sridhar et al, 1982;Sridhar, 1999).
Recently in Nigeria, drinking water is commercially available in easy-to-open 50-60ml polyethylene sacks known as sachet/pure water (Umeh et al., 2005). The water vending is a flourishing business in Abuja Nigeria and many people are lured into this business for getting easy returns. The major supply which has become popular among the medium and low income groups are the cheap nylon sachets either registered with the regulatory body (National Agency for Food and Drug Administration and Control NAFDAC) or without registration. Conformation with microbiological standard is of special interest because of the capacity of water to spread diseases within a large population.

Although the standards vary from place to place, the objective anywhere is to reduce the possibility of spreading waterborne diseases in addition to being pleasant to drink, which implies that it must be wholesome and palatable in all respects (Edema et al., 2001; Okonko et al., 2008). A collaborative, interdisciplinary effort to ensure global access to safe water, basic sanitation, and improved hygiene is the foundation for ending cycle of poverty and diseases (Hughes and Koplan, 2005). At the end of 2000 United Nations (UN) Millennium Summit, member states adopted a set of 8 goals and related targets and indicators aimed at helping to end human poverty and its ramifications (Sachs and McArthur, 2005). According to Hughes and Koplan, (2005), among these millennium Development Goals is a call to halve by the year 2015 the proportion of persons without sustainable access to safe drinking water and basic sanitation. Towards the end of March 2005, the UN launched the “International Decade for Action: Water for Life 2005-2015” (UN, 2005; Bartram et al., 2005). Success in reaching these targets will help achieve the other goals, increase work force productivity, and substantially reduce the amount of time that women and children spend collecting and storing water, which will free them to pursue other productive and educational activities (Hughes and Koplan, 2005).

According to Bartram et al., (2005), the WHO-sponsored International Network for the Promotion of Safe Household Water Treatment and Storage, a global collaboration of UN and bilateral agencies, non-governmental organizations, research institutions, and the private sector, could serve as a model for improving coordination of international efforts in this area of global safe water, sanitation, and hygiene. Innovative approaches towards improving water, sanitation, and hygiene must be implemented and evaluated. A number of studies conducted in a variety of geographic settings have shown that interventions such as point-of-use disinfection of water and educational efforts to improve personal hygiene help reduce disease prevalence (Clasen and Cairncross, 2004). These studies also highlighted the importance of tailoring such interventions to local situations (Hughes and Koplan, 2005). A recent study in an area in rural western Kenya that had turbid source of water found that household use of flocculants disinfectant Preparation helped to reduce the prevalence of diarrhea in children less than 2 years of age (Crump et al., 2005). Studies in refugee camps in Africa (Peterson et al., 1998) and urban slums in Asia (Luby et al., 2005) have reported that hand-washing with soap reduced the prevalence of diarrhea in all age groups and lowered the incidence of diarrhea and pneumonia in children less than 5 years of age.

**AIMS AND OBJECTIVES**

1. To assess and compare the physicochemical and microbiological qualities of packaged water sold in Abuja Metropolis.
2. To find out if the packaged water sold, is in conformity or otherwise with the standards set by the regulatory body.
3. To identify the organism common to packaged water sold in Abuja.

**LITERATURE REVIEW**

Water quenches our thirst and refreshes us. That’s how it has always been but will it stay like that? We take our most valuable good for granted. To humans, water is indispensable. In the home, water is used for cooking, washing, bathing and other domestic uses. Industrially, water is the starting point of most processes. The chemist says that water is a universal solvent following his findings that most chemicals are soluble in water. For the biologist, it is even more important for the growth of organisms and for carrying out fermentation for the production of products useful to man. (Ibemesim, 1998)

However, one of the most widespread and directly accessible sources of water is rainfall itself. For municipal water supplies, rainwater is rarely used directly. It is most often used as a source of water supply in rural town and villages or communities which do not have any other source of water supply or for areas where water is very 'hard' and unpalatable (Johnson, 1981). Rain water is soft and it is most suitable for laundry purposes. Due to the absence of minerals, rain water is insipid and when in equilibrium with atmospheric gases (carbon dioxide) it is corrosive (Al-layla, 1978). Available water includes surface such as that provided by streams, rivers and lakes as well as ground water which is subsurface water that fill small openings (pores) of loose sediments (such as sand and gravels or rocks). (Jan et al., 2002).

An examination of water quality is basically a determination of the organisms, minerals and organic compounds contained in the water. The basic requirements for drinking water are that it should be free from pathogenic organisms, contain no compounds that have adverse effects on human health, be fairly clear, be non-saline, contain no compounds that cause an offensive taste or smell and cause no corrosion (Kott, 1974).

Jan et al. (2002), described water treatment to involve the conversion of water taken from the natural sources, the “raw water” into that suitable for domestic use. Ground water and surface water usually require more critical treatment than rain water. Harvested water also requires some form of treatment. Most important is the removal of pathogenic organisms and toxic substances such as heavy metals that can cause health problems. Storage of water may be regarded as a form of treatment. Schistomiasis ceracariae are normally unable to survive 48 hours of storage (Mann and Williamson, 1968). Also the number of faecal coliforms and faecal streptococci will be considered reduced when the raw water is subjected to storages (Smethurst, 1979).

Various water treatment processes called unit operations have been developed. Some serve a single purpose while others have multiple applications. Often, a treatment result can be obtained in different ways. Water treatment employs aeration, coagulation and flocculation, sedimentation, slow sand filtration and rapid filtration and disinfection. The principal methods of purifying water on a small scale are those used locally in areas where water harvesting is carried out include sedimentation, coagulation, boiling and filtration.

Boiling is the most satisfactory way of destroying disease-producing organisms in water. It is equally effective whether the water is clear or cloudy, whether it is relatively pure or heavily contaminated.
with organic matter. Boiling destroys all forms of disease producing organisms usually encountered in water whether they are bacteria, viruses, spores, cysts or ova. To be safe the water must be brought to a good rolling boil (not just simmering) and kept there for 15-20 minutes. Boiling drives out the gases dissolved in the water and give it a flat taste but if the water is left for a few hours in a partly filled container, even though the mouth of the container is covered, it is wise to store the water in the vessel in which there will be no risk of re-contamination (Lorch, 1987)

**MAIN SOURCES OF DOMESTIC WATER**

The major sources of drinking water in most of the rural areas include: Streams, Lakes, Rivers, Ponds, wells and Rainwater. These are mostly surface water and may have the following disadvantages. Water from deep wells and deep springs usually dissolves a lot of salts and other minerals and so the water becomes salty, sometime too salty or "hard" for any use unless the salts are removed which is expensive. This water generally needs pumping from great depth often to tanks or reservoirs before reaching the user (Cheesbrough, 2000).

Potable water in Abuja is normally obtained from Dams, lake and wells. The water bottled and sold in various stores and markets is normally obtained from springs or packaged from pipe supplies. All public supplies of drinking water are assumed disinfected before distribution. Potable water is often treated by chlorination. This makes the water free from any coliform organism no matter how polluted the original water may have been (WHO, 2004).

Potable water is free of pathogens and toxic chemicals. Non-potable water is one contaminated with domestic and industrial waste. There are so many characteristics that make water not potable such as taste, smell, pH, colour/turbidity and mineral salts (WHO, 2005). Purification can be done by coagulation, which is by adding alum, Nitrogen aluminates or ferric chloride to the water. Using the sand bed method, filtration can be carried out or repair sand bed filters can also be used. For the correction of pH of potable water, limestone is added. Low pH will cause corrosion.

**SOURCES OF WATER POLLUTION**

Waterborne pathogens make their entry into the water bodies through a number of sources. Recycling of treated/inadequately treated wastewater by mixing them with natural water bodies adds microorganisms. When septic tanks are built near the water bodies mixing or seeping of excreta may occur and this may act as a source of waterborne pathogens. Quite a large number of pathogens will be added if the population suffers from an enteric disease. Wastewater from abattoirs and animal processing plants also contribute to the waterborne pathogens. Droppings from nearby birds and faecal materials of domestic and wild animals including those of diseased ones are another potential source.
WATER RELATED HEALTH RISK

Problems due to a lack of water: - In extreme cases of lack of water, life is simply not possible (dehydration and death) since water makes up more than 85% of the protoplasm. Less extreme shortages also have an impact on the health status of a population. They provoke an increase in the incidence of numerous diseases due to a lack of good hygiene; good personal hygiene requires a sufficient quantity of water (Ibemesim, 1998). The diseases linked to water can be classified into water-washed and water-borne diseases.

WATER-WASHED DISEASES

These are diseases that resulted from lack of water for personal hygiene and they include Dermatological and Ophthalmic diseases, Diseases Transmitted by Lice, and Faeco-Orally Transmitted Diseases. Lack of personal hygiene particularly washing of clothes, hands and food, allows the transmission of these diseases from infected individuals (sick people or carriers) to uninfected individuals. These so called “dirty hands diseases” are: diarrhoea and dysenteries (bacterial, protozoan, or viral), cholera, typhoid and paratyphoid fevers, hepatitis A, poliomyelitis, and various helminthes diseases. Poor personal hygiene also encourages the proliferation of some disease vector like lice, resulting to itching, scratching and skin sores due to their bites. They could also transmit louse-borne typhus and recurrent fever.

WATER BORNE DISEASES

Water should be harmless to health and have an appearance and taste (Medecins Sans Frontieres, 2008) acceptable to the population. Ideally the water supplied should meet the quality standard of the WHO. Quite a number of human pathogens find their way into a susceptible host through contaminated water. These pathogens often called waterborne pathogens, have the ability to survive at least for a short period in water and thus water may act as a route of transmission for them. Waterborne diseases are posing a serious threat to health since the potential of contaminated water to transmit disease is very high. Often they lead to epidemic.

According to a WHO survey about 30,000 people die from water-related diseases every day. About 80% of all illness in developing countries is water related (Jan et-al.,2002). Water plays an essential role in the spread of many communicable diseases and epidemics. Diarrhoeal diseases, mostly caused by poor hygiene and lack of safe water, are a major cause of morbidity and mortality among refugee and displaced populations. Large scale and severe outbreaks have occurred frequently, particularly in the initial phase of a refugee crisis situation. The most striking example is that reported among Rwandan refugees in Goma (Zaire) during the 1994 Genocide, where extremely high mortality rates were associated with explosive epidemics of Cholera and shigellosis (Medecins Sans Frontieres, 2008).
PROBLEMS DUE TO CHEMICALLY CONTAMINATED WATER

Water may contain numerous dissolved chemical substances which come either from pollution (fertilizers, insecticides, pesticides, industrial waste etc), or from the composition of the rocks themselves (fluorine, arsenic, iron etc). These substances may give the water a bad taste that it is undrinkable (for instance, if it contains too many salts or too much iron), but it may also in the long term, cause severe health problems for example: Methaemoglobinemia in babies due to high nitrate levels, arsenic poisoning etc. Unsafe Water contaminated with heavy metals, leads to renal failure, Hair loss, and Chronic Anemia. The possible presence of toxic substances in water is something which must be borne in mind, but in the situations considered here, the micro- biological quality of the water is a much more important and preoccupying problem.

PROBLEMS DUE TO MICROBIOLOGICALLY CONTAMINATED WATER

Water may contain numerous pathogenic organisms and thereby become a means of transmission for many diseases. These includes: Typhoid and paratyphoid fever, Hepatitis A, Cholera, Poliomyelitis, Diarrhoea (caused by Escherichia coli, Salmonellae, Yersinia Enterocolitica), Viral gastroenteritis, Bacillary dysentery (caused by various species of shigellae), Campylobacter dysentery, Amoebic dysentery, Giardia (lambliasis), Balantidiasis, Helminthiasis (cause by ascaris and trichuris). It should be noted that these so-called “water-borne” diseases form part of the group of “water-washed” diseases as well. They may also be transmitted by any of the faeco-oral routes; dirty hands, dirty food, dirty water etc. Besides these diseases, water is also involved in the transmission of “water- based” diseases (in other words, those diseases of which the causative agent passes part of its life cycle in an aquatic plant or animal): The different schistosomiasis or bilharzias: diseases caused by helminths (worms) which are usually contracted by contact with infected water (washing clothes, bathing etc), but sometimes also via the oral route.

Dracunculiasis (Guinea worm), transmitted only by drinking infested water. (Medecins Sans Frontieres, 2006). Lastly, water may also transmit: Leptospirosis: a bacterial disease which is contracted primarily by contact with water contaminated with the infected urine of various animals (principally the rat), but also by drinking such water. All the infectious diseases transmitted by water with exception of guinea worm are linked to the pollution of the water by the excreta of humans or other animals (from the sick or from the healthy carriers). One last category of water related diseases is those with an insect vector which develops in or lives near to the water, for example malaria, dengue and yellow fevers, and onchocerciasis. (Medecins Sans Frontieres, 2006).

ASSESSMENT OF WATER QUALITY

The only criteria really of importance to health are the presence or the absence of pathogenic organisms and of toxic concentrations of certain chemicals. There is no direct relationship between the appearance of a sample of water and its portability. (A cloudy sample may be safe, whereas a clear sample may be both chemically and biologically dangerous).
BIOLOGICAL ANALYSIS

The pathogenic organisms which may be present in water are too numerous and too various to be identified individually in practice (bacteria, protozoa, helminths etc). As their presence is always linked to faecal pollution (except for guinea worm), it is preferable to look for organisms which are “indicators” of this pollution. The common feature of all these routine screening procedures is that the primary analysis is for indicator organisms rather than the pathogens that might cause concern. Indicator organisms are bacteria such as non-specific coliforms, Escherichia coli and Faecal Streptococci that are very commonly found in the human or animal gut and which, if detected, may suggest the presence of sewage. Indicator organisms are used because even when a person is infected with more pathogenic bacteria, they will still be excreting many million times more indicator organisms than pathogens. It is therefore reasonable to surmise that if indicator organism levels are low, then pathogen levels will be very much lower or absent.

The count of those colonies which develop with a characteristic appearance gives the number of faecal coliforms in the sample of water. When Multiple Tube method is used and incubated at 37°C all the coliforms will develop (Total coliform count)/100ml and can easily be enumerated. (Cheesbrough, 2000).

NIGERIAN STANDARD FOR DRINKING WATER

Nigerian Standard for Drinking Water Quality contains mandatory limits concerning constituents and contaminants of water that are known to be hazardous to health and/or give rise to complaints from consumers. The standard includes a set of procedures and good practices required to meet the mandatory limits.

DRINKING WATER QUALITY STANDARD USED IN NIGERIA

In 2005, the National Council on Water Resources (NCWR) recognized the need to urgently establish acceptable Nigerian Standard for Drinking Water Quality because it was observed that the “Nigerian Industrial Standard for Potable Water” developed by Standards Organization of Nigeria and the “National Guidelines and Standards for Water Quality in Nigeria” developed by Federal Ministry of Environment did not receive a wide acceptance by all stakeholders in the country. Since water quality issues are health related issues, the Federal Ministry of Health, collaborating with the Standards Organization of Nigeria (the only body responsible for developing National Standards in Nigeria) and working through a technical committee of key stakeholders developed this Standard. The effective protection of public health against water related diseases requires a preventive integrated management approach, this includes:

a) The protection of drinking water from catchments and source to its use by consumers.

b) A collaborative multi-agency approach that involve all agencies with responsibilities in the management of water quality.
c) Water quality standard that is comprehensive, realistic and implementable within the resources of the implementing agencies.

d) The development of procedures and requirements that ensure good water quality management in order to meet the maximum allowable limits. These procedures also protect the environment.

e) An independent surveillance agency with strong enforcement authority and functions decentralized to local government level.

f) An effective drinking water quality data management system to enable generation of data for the development of coherent public health-centred policies and practices. (Standards Organization of Nigeria, 2007).

PACKAGED WATERS IN THE MARKET

The water vending is a flourishing business in Abuja and many people are lured into this business for getting easy returns on investment. The major supply which has become popular among the medium and low income groups are the cheap nylon sachets either registered with the regulatory body or with no registration. There are about 200 brands or even more of packaged water available in the city at the time of this study although quite a large chunk are produced in neighbouring states like Nasarawa, Niger, Kaduna and Kogi and the number is increasing every day. They are broadly classified according to the packages and price tag as well.

Bottle water is usually manufactured and marketed by standard companies, both local and Multi-nationals. These waters are either drawn from natural springs, or deep boreholes some are even from public mains and treated according to the specifications like Aeration whereby water entering the plant is sprayed into the air through nozzles, producing a fountain-like effect. Breaking the water into small drops creates a proper oxygen balance, releasing trapped gases that can cause objectionable tastes and odors. Filtration by passing through various filters like sand and Activated Carbon filters, Reverse osmosis and disinfected appropriately using either ultra-violet radiation or ozonation or both. Ozone is used for disinfection and control of taste and odor causing compounds. This bottle water is available in 50cl, 75cl, 150cl and 20L jar bottles.

These are relatively expensive (at the rate of Naira 60, 100-400 <1-2USD) and is a class thing being very popular among hotels and restaurants and people from higher socioeconomic strata. The source is well protected. An in-house quality control laboratory usually checks the water quality.

Plastic packaged water, popularly called sachet “pure water” which is manufactured by small to medium scale industries (either in a shed or garage or in most cases in standard houses and factories) with a registered name and supposed to have been prepared under Government stipulated hygienic quality regulations. According to the specifications, the water is passed through a series of sand and activated carbon or suitable filtering media and Millipore or equivalent filters of a specific pore size,
and disinfected using ultraviolet radiation for a specific period. They are packed in 50cl or 60cl nylon
/ plastic film sachets and sealed by a sachet packaging machine. They are put in larger sacks in
dozens and transported to various distribution points in open pick-up vehicles. Sometimes the sealing
is poor and quality control is rather questionable. The source in many cases is not well protected and
human errors in the manufacturing process are possible. The price is affordable (Naira 10 < a cent)
mostly for the middle income groups. They are popular at social gatherings and public places and are
hawked along the streets with reckless abandon thereby littering the environment with the nylon
material after being consumed.

THE ROLE OF PACKAGED / “PURE WATER” PRODUCERS TOWARDS
NATIONAL DEVELOPMENT

According to Akunyili, regulation and control of packaged water is not only the responsibility of
NAFDAC but also that of the manufacturers, consumers and other relevant government organs. This
team approach to regulation is necessary because of the dire consequences of consuming poor quality
water to public health. Consumption of contaminated or poorly produced water could result in water-
borne diseases like cholera, typhoid fever, diarrhoea etc. Chemical contaminants such as lead, iron,
nitrates, etc. in water also give rise to illness(e.g. liver and kidney problems) and even death. Water
borne diseases resulting from contamination are treated with scarce funds thereby further
impoverishing the masses and causing underdevelopment. Pure water manufacturers form a major
part of the small medium scale industries (SMIs) in Nigeria. Studies have shown that about 10-15
percent of total manufacturing output is from the SMIs and this accounts for over 40 percent of gross

Packaged water especially the sachets (Pure water) production is a good poverty alleviation
programme and should be encouraged. It is an industry that has immense potentials for job and
income generation. With the number of pure water and bottled water outfits in the country (and
judging by about 10,634 participants at NAFDAC water workshop) their retinue of staff should stand
in the region of over fifty thousand strong workforce. This number excludes the chain of wholesalers
and retailers that generate income from selling packaged water products. The disposal of waste
generated from the production and use of packaged water constitutes one aspect of environmental/
health hazard that must be tackled by all stakeholders. Waste-to-wealth programmes have created
great wealth for many nations. The Agency therefore suggests that the Ministry of Environment and
the private sector participate in the reactivation of recycling programmes that will generate
employment, boost our economy, protect the environment and promote health. Some countries that
are not endowed with oil wealth recycle cellophane bags, (which presently litter our streets) into other
very useful materials (Akunyili, 2003). NAFDAC encourages the promotion and use of biodegradable
packaging materials. They are often cost-effective and enhance proper disposal, thus reducing public
health risks.

NAFDAC is concerned about this because, improperly disposed waste effects the health and well
being of the people and negates the positive impact of our regulatory activities. It is in recognition of
these facts that NAFDAC insists that there must be an environmentally friendly disposal instruction
on the packaged water before it can be registered. This they enforce to the letter though
environmental protection is not their mandate but a social responsibility. The packaged water
industry has enormous export potentials. Nigeria’s problem is not poor availability of water resources
rather that of poor management of these resources. Well processed and properly packaged water can
be exported to earn much needed foreign exchange. It is an embarrassment for Nigerians to import packaged water in any form. Manufacturers therefore must improve their standard as well as output to recapture the present market share taken by smuggled water/water based products (Akunyili, 2003). Self regulatory measures should be put in place by manufacturers of packaged water. This way the Agency will focus better in assisting them to meet their optimal potentials in terms of product safety, quality, acceptability and marketability both locally and internationally. The result of our post marketing surveillance show that self regulation by pure water manufacturers still leave a lot to be desired (Akunyili, 2003).

STUDY AREA

The study area is the municipal area of Abuja, which is made up of six local government councils. The city is the Federal Capital Territory of Nigeria with a population of over twelve million and also houses the Diplomatic community in Nigeria and all Federal Ministries and Parastatals and a lot of Universities owned by both Nigerians and expatriate community alike. However, the city is characterized by high and low level of environmental sanitation, no slums but scattered poor housing in some localities with lack of potable water and improper management of wastes especially in the indigenous core areas characterized by high density and low income populations mostly the Indigenes.

SAMPLING OF WATERS

From the well over 200 brands of water sold in the city at the time of this study, 200 samples were selected by simple random sampling method (here, the selection of units from a population is based on the principle of randomization. Every unit of the population has a calculable (non-zero) probability of being selected.

RANDOM SAMPLING: A subset of the population in which every member of the population has an equal likelihood of being selected.) from various vendors. The distributions of samples were as follows: bottle water 100 brands, Sachet water 100 brands were picked from the market for ease of calculation and also the higher the sample size the better the representation of each brand in the actual population. It was assumed that the bottle water quality will be satisfactory relying on the fact that the quality control of those factories producing bottle water is very high in the large scale industries. Therefore all the water samples from the 100 brands were collected from different sellers in different outlets. These were purchased directly from water vendors in the markets, Hotels, food serving areas (Bukhas) and motor parks in the six Local Government Areas of the metropolis (Abuja Municipal, Karsh, Kuje Buwari, Gwagwalada and Abaji). The samples were collected and stored in cool boxes and transported to the laboratory. The number collected on a day are immediately processed for physico-chemical and bacteriological analysis as described in Standard Methods (APHA 1998). For bacteriological analysis, the bottles and sachets were opened under aseptic conditions.

METHODOLOGY
The physical parameters included pH, temperature, total dissolved solids (TDS), oxidation reduction potential (ORP) and electrical conductivity (EC). Chemical parameters included cation and anion constituents: aluminum, calcium, chromium VI, iron, magnesium, zinc, chloride, cyanide, fluoride, nitrite, and nitrate, total alkalinity, total hardness and total and free chlorine. Hanna C-100 spectrophotometer (HI 83099 COD and Multiparameter Photometer made in UK) and chemical reagents supplied along with the kit were used for analyses. Total hardness was determined using EDTA titration method using Eriochrome Blak T indicator. Chloride was determined using the silver nitrate titration method using potassium chromate indicator. Total alkalinity was measured titrimetrically using mixed indicator. For bacteriological analysis (Total and faecal coliforms), multiple tube method was used. The culture media used were MacConkey Broth (MB) and Brilliant Green Bile Broth (BGBB).

After inoculation of the media with the samples, the BGBB culture tubes were incubated at 37°C for 2 hours before transferring them to 44°C incubator for 18 hours. The MB cultures were incubated at 37°C for 18 hours. After the incubation period, the cultures were inspected for changes in colour and gas production. Those showing growth with or without gas production were noted. Those showing no changes in colour were re-incubated for additional 24 hours. The tubes showing changes in colour are counted and the MPN count expressed per 100 ml of sample as per the Mac-Grady's Probability Table. The cultures that showed growths were also sub-cultured on MacConkey agar plates to obtain discreet colonies to facilitate easy isolation and identification of the predominant organisms. Quality control and Quality Assurance were ascertained appropriately. Standard Methods for water analysis as described by the American Public Health Association (Mara and Oragui 1985, APHA 1998) were employed. The coliform counts were expressed as cfu/ 100 ml.

**SAMPLING OF WATER**

A total of 200 packaged water samples comprising of 100 brands of bottle water and 100 brands of Sachet water were purchased directly from water vendors in the markets, food serving areas (Eateries, Bukhas), motor parks and retail outlets of some of the producers in the metropolis. However, the choice of 100 to 100 samples of sachet to bottle was for ease of calculation and also the higher the sample size the better the representation of each brand in the actual population. The samples were stored in cool boxes and transported to the laboratory without delay. The samples collected were processed within six hours of collection.

**CULTURE MEDIA AND REAGENTS**

The culture media and reagents used for this project and their preparations are in appendix 2.

**METHODS**

**PRESUMPTIVE COLIFORM TEST BY:**

*MULTIPLE TUBE METHOD*
In this method, both single strength and double strength sterile MacConkey Broth (MB) were used. Here, 50mls of the Double strength MB was placed in a tube, and 10mls each, was placed into 5 tubes containing inverted Durham tubes for the collection of gas produced. 1ml of the water sample were added into each tube, mixed thoroughly and incubated aerobically at 37°C for 18-24 hours after which Statistical tables was used to derive the concentration of organisms in the original sample.

**DETERMINATION OF VIABLE BACTERIAL COUNTS**

The numbers of tubes with positive presumptive test were sub-cultured on fresh Plate Count Agar (PCA) and the colonies were counted for each dilution, using the formula stated as follows. Plates showing total counts of about 20 colonies were selected and the number of viable bacterial per ml of sample was determined by multiplying the number of colonies counted by the dilution factor and capacity of pipette as expressed mathematically below;

Calculation: - Number of viable bacterial /ml  
Number of colonies counted x dilution factor x volume of pipette = x orgs/ml.

**IDENTIFICATION OF ISOLATES**

The isolates from Plate Count Agar were sub-cultured on MacConkeyAgar and Nutrient Agar. Pure isolates of resulting growth were identified using morphological and biochemical methods as described by APHA, (1998). The sterility of each batch of test medium was confirmed by incubating one or two un-inoculated tubes or plates along with the inoculated tests. The un-inoculated tubes or plates were always examined to show no evidence of bacterial growth. After inoculation of the media with the samples, the MB cultures were incubated at 37°C for 18 hours. After the incubation period, the cultures were inspected for changes in colour and gas production. Those showing growth with or without gas production were noted.

Those showing no changes in colour were re-incubated for additional 24 hours. The tubes showing changes in colour were counted and the MPN count was expressed per 100 ml of sample as per the Mac-Grady’s Probability Table. The cultures that showed growth were also sub-cultured on MacConkey agar plates to obtain discreet colonies to facilitate easy isolation and identification of the predominant organisms. Quality control and Quality Assurance were ascertained appropriately.

Standard Methods for water analysis as described by the American Public Health Association (Mara and Oragui 1985, APHA 1998) were employed. The coliorm count is expressed as cfu/ 100 ml.

**GRAM STAINING**

Gram stain was done on each bacterial isolate and examined microscopically using oil immersion objectives. The reaction test was carried out on all the different isolates.
MOTILITY TEST BY HANGING DROP METHOD

This was done to determine the presence of motile organisms. A ring of plasticine of about 2cm in diameter was made on a grease free slide. A loopful of a 24 hour broth culture of gram negative bacilli was placed at the center of a clean coverslip measuring about 22 x 22mm in dimension. The slide was gently pressed on the cover slip such that the drop of the culture was positioned at the center of the plasticine ring. The slide was inverted and the coverslip seen uppermost. The preparation was examined under x10 and x40 objectives. Motility was indicated by movement of the bacterial cells within the hanging drop.

BIOCHEMICAL CHARACTERIZATION OF THE ISOLATES

Biochemical tests were carried out and all results obtained with reference to (Cheesbrough, 2000) were noted.

COAGULASE TEST

This test is used to determine the ability of an organism to coagulate plasma by the action of the enzyme coagulase thereby converting fibrinogen to fibrin. It is used to differentiate between Staphylococcus aureus and non-coagulase Staphylococci. 0.5ml of 1:10 diluted human plasma was placed in a clean khan tube.0.1ml of overnight broth culture of the organisms was added. This was mixed, incubated at 37°C for 30mins to 6hours and observed for clot formation.(observation was made at 1hr interval)

INDOLE TEST

This determines the ability of an organism to breakdown tryptophan by the activity of an enzyme tryptophanase to release indole as a by-product. In a test tube containing a 24-hour broth culture of the test organism, 0.5ml of kovac’s reagent was added and shaken. This was observed for colour change at the top layer (ring). A rose pink-red colour ring was taken for positive result and no colour change for negative result.

OXIDASE TEST

This is carried out to determine the oxidase producing ability of some organisms. The tetramethyl paraphenylene diamine dihydrochloride solution is oxidized to a deep purple colour by oxidase enzyme produced by some organisms. A piece of filter paper was soaked in oxidase reagent, a smear of the suspected colony was made on the soaked filter paper. Purple colour indicated positive result within 10 seconds while negative showed no colour change.
CITRATE UTILIZATION TEST

This is based on the ability of an organism to utilize citrate as its only source of carbon and ammonium as its only source of nitrogen. The citrate is metabolized to acetoin and carbon dioxide. A broth culture of the organism to be tested was inoculated into Simmon’s Citrate Agar slope with a straight wire loop and incubated at 37°C for 24 hours. A change in colour from green to deep blue is considered positive.

UREASE TEST

This test is used to determine the ability of an organism to produce the enzyme urease. The urease is able to decompose urea by hydrolysis to give ammonia and carbon dioxide. The ammonia produced makes the medium alkaline so that the colour of the indicator becomes pink. The test organism was stabbed into the medium using a sterile straight wire, and then a streak was made on the slope. This was incubated at 37°C overnight with the covers loosely capped. Colour change to red-pink for positive results while negative showed no colour change.

DISCUSSION AND CONCLUSION

This study showed that 10 out of 100 brands of sachet water were contaminated by different organisms such as Klebsiella species Streptococcus faecalis, Pseudomonas aeruginosa and Escherichia coli (Table 1). This finding agreed with that of Ibemesim A.O (2009), Umeh et al (2005) in which these organisms were isolated in addition to other organisms. Although physical examination of the water samples analyzed did not show any particulate object or discoloration of any type yet the presence of pathogenic bacteria in them calls for a serious concern. According to Umeh et al (2005), bacterial growth in water may be unnoticed even in transparent packaged water and the presence of some of these organisms may pose a potential health risk to consumers.

The coliform count range of 0.32 x 10^2 to 1.95 x 10^2 recorded in this work (Table 2) is above the value recommended by the WHO. This might be unconnected to the improper sterilization, poor handling of the products in the course of production, transportation and sales of the products. This supports the earlier views of Osibanjo (1999) and Umeh et al (2005) that the sachet water being produced is of questionable quality. The implication therefore was that all the 200 water samples investigated carried NAFDAC (Registration) approval numbers and the products are popularly and freely served at open parties and social functions. Also, the possible contamination of sachet water at the point of production has been confirmed by Chaidez et al (1999) and Dan Rutz (1996) in which they reported that pure water vending machine may not be so pure, after all, because investigations found bacteria like Escherichia coli in the machine. However, it was gratifying to note that all the bottle water analyzed in this study were free from bacterial contamination which possibly showed that the manufacturers adhered strictly to the guidelines set up by NAFDAC and SON.

CONCLUSION

The results obtained so far highlights the fact that communities in urban areas suffer from acute portable water shortages. To augment this situation, many entrepreneurs took to packaged water
business – production and vending. There is a rush to get into business and as a result quality control has been compromised. Therefore, packaged water other than those in company sealed bottles could pose as a source of waterborne infection as this study has shown that the bottle water is obviously of better quality than the popular sachet water. Even though Nigeria has national guidelines and regulations, and the regulatory agencies, the monitoring of the packaged water quality is poor as shown in this study where a product that has NAFDAC certification still fail to meet standard for portable water. There is, therefore, a need to monitor all those involved in water business to comply with the guidelines to avert possible outbreak of water-borne diseases as a result of consumption of contaminated water.

**RECOMMENDATION**

Tap water, bore-hole water, and publicly sold sachet and bottle water should be adequately treated before use and NAFDAC should ensure and enforce strict compliance to the standards as regards the production and sales of packaged sachet water. Packaged water consumers should be aware of a possible danger of consumption of poorly packaged water especially the sachet water and the potential health risk associated with such. Also NAFDAC should apart from educating the consuming public on the dangers of patronizing sachet pure water that does have NAFDAC approved numbers; producers should also be educated on how to maintain Good Manufacturing Practice (GMP) and companies that fail to maintain the standard should be properly sanctioned either by stipulating adequate fines to be paid or  outright withdrawal of their production Licenses.

Even though Nigeria has national guidelines and regulations, and the regulatory agencies, the monitoring of the packaged water quality is poor as shown in this study where a product that has NAFDAC certification still fail to meet portable water standard. There is, therefore, a need to monitor all those involved in water manufacturing business to comply with the guidelines. The national regulatory bodies and Ministries of Health, Water Resources as well as those of Trades and Industries should exercise more stringent surveillance programmes and educate the producers and the consumers alike on the need to look for water quality, proper labeling and certification. To achieve this goal the manufacturers, the consumers and government should work together to achieve this common goal for the betterment of all.

**APPARATUS USED**

1. Autoclave
2. Bunsen burner
3. Bijou bottles
4. Colony counter
5. Coverslip
6. Conical flasks
7. Glass slides
8. Hanna C100 spec
9. Incubator
10. Inoculating loop
11. Microscope  
12. Measuring cylinders  
13. Masking tape  
14. Pipettes (various volumes)  
15. Non absorbent cotton wool  
16. Refrigerator  
17. Racks  
18. Weighing Balance  
19. Test tubes  

MEDIA PREPARATION  
All the culture media used in the work were prepared according to the manufacturer’s instructions and specifications.  

MEDIA AND REAGENTS USED  

MEDIA  
1. Nutrient Agar  
2. MacConkey Agar  
3. MacConkey Broth  
4. Plate Count Agar, Triple Sugar Iron Agar (TSIA)  
5. Distilled water  
6. Peptone water  

REAGENTS  
1. Crystal Violet  
2. Oxidase Violet  
3. Oxidase Kovac’s reagent  
4. Potassium Iodide  
5. Acetone Neutral red iodine  
6. Hanna Reagent for Physico-chemical analysis of water  
7. Immersion Oil  

TRIPLE SUGAR IRON AGAR (TSIA) TEST  
TSIA is used in the identification of gram negative bacilli, particularly, members of the enterobacteriaceae. TSIA detects three primary characteristics of bacteria; the ability to produce gas from the fermentation of sugars, the production of hydrogen sulphide and the fermentation of lactose and sucrose with acid production or non fermentation of lactose and sucrose with acid production or non fermentation with alkaline production. TSIA slope was inoculated with the suspension of the test organisms by stabbing through the butt with a straight wire and streaking the surface of the slope. It
was incubated at 37°C overnight with cotton wool loosely plugged. Fermenting organisms produce an acid reaction (yellow colour) throughout the tube gas production and hydrogen sulphide production was also considered. Oxidizing organisms produce an alkaline reaction (red colour) at both slope and butt. (Cheesbrough, 2000).

RESULTS
The total count of most of the water samples ranges between 0.32 x 10^2 and 1.95 x 10^2 CFU/ml, exceeding the limit of 1.0 x 10^2 CFU/ml. The MPN of coliform counts ranged from 1 to 16 cfu/100 ml of sample. The total aerobic Mesophilic Bacteria Count cfu/100ml of those samples of sachet water that gave moderate growth is 1.2 x 10^2. Coliform, Escherichia coli counts of those samples that gave heavy growths are 2.0 x 10^2 and 1.0 x 10^2 respectively. The entire bottled water sample analyzed showed no bacterial growth. The dominant bacteria were Escherichia coli, Streptococcus faecalis and Pseudomonas aeruginosa. The total counts for some of the water samples were generally high, exceeding the recommended standard limit for water (FAO, 1997; Okonko et al., 2008).

There were no traces of Heavy Metals in all the water samples analyzed and the chemical parameters were all within the permissible limits. The isolated bacteria species were identified to be same with those commonly encountered in water and aquatic environments as was also reported in a study on streams surface water in Wyoming in U.S.A. reported by Clark and Norris (1999) and reviewed by Banwo (2006). These identified isolates include Bacillus cereus, Enterobacter aerogenes, Flavobacterium sp., Micrococcus sp., Escherichia coli, Pseudomonas aeruginosa and Staphylococcus aureus.

The presence of Coliforms and Pseudomonas aeruginosa reported in this study has also been reported by Umeh et al., (2005) in a study on the bacteriological quality and safety of pure water sold in Akwa, Nigeria using membrane filtration method. Umeh et al., (2005) reported the presence of enteric bacteria associated with fecal contamination and this include Streptococcus faecalis, Citrobacter species, Proteus mirabilis, Providencia species, Micrococcus species, Escherichia coli, Shigella species, Enterobacter aerogenes, Serratia species and Klebsiella species. Bacterial growth in water may be unnoticed even in transparent packaged water and the presence of some of these microorganisms may pose a potential health risk to consumers (Umeh et al., 2005).

REFERENCES


MATERNAL MORTALITY IN THE CHADIAN OUADDAI REGION HEALTH FACILITIES COMPARED TO THE WHOLE COUNTRY

A Case Study By Dr. Paluku Kapitula Augustin, Republic of Chad
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ABSTRACT

Maternal mortality is one of Chad’s most pressing issues. Chad’s maternal mortality ratio is 1,200 per 100,000 live births, the third highest in the world (WHO 2010). A woman’s lifetime risk of maternal death is 1 in 14, one of highest in the world (Country statistics; “Unicef”). The Ouaddai region being one of the Chadian regions benefiting from humanitarian assistance due to the Darfuri Sudanese refugees’ presence since 2004, this region is not sharing the alarming statistics as hereby presented. This study aims first to examine and analyze maternal mortality ratio in Ouaddai health facilities in comparison to all the country, second to light the disparities between MoH health facilities and the ONGs supported health facilities (refugee camps) within Ouaddai region. Using three years data extracted from the UNHCR Health Information system and the MoH health information database in the region, we ran a retrospective MMR study to estimate the difference relevant to each location in the Region.

The results show that the Maternal Mortality is statistically different in each of the two locations within Ouaddai and different comparing Ouaddai region to the whole country. The differences noticed is likely due to the quality health provided in the refugee camps which contribute to improve the health of women in the host communities who are benefiting for a free of charge health services in the refugee camps.

KEYWORDS

Maternal mortality, Chad, Maternal death, Ouaddai region, HGRN, Neonatal mortality.
INTRODUCTION

COUNTRY PRESENTATION.

GEOGRAPHY

A landlocked country in north-central Africa, Chad is about 85% the size of Alaska. Its neighbors are Niger, Libya, the Sudan, the Central African Republic, Cameroon, and Nigeria. Lake Chad, from which the country gets its name, lies on the western border with Niger and Nigeria. In the north is a desert that runs into the Sahara.

By 2004, about 250,000 Sudanese refugees had fled to Chad to escape the fighting in Sudan's Darfur region, where they are living under humanitarian assistance within refugee camps. The Ouaddai region, being the core region for this study, is one of those eastern region which hosted Sudanese refugees. This health region has itself 4 Sudanese refugees’ camps as follows: Treguine, Gaga, Farchana and Bredjing the biggest refugee camp in Eastern Chad.

DEMOGRAPHY

Chad ended 2012 with a population of 12,448,175 people, which represents an increase of 922,679 people compared to 2011. The male population is greater, with 6,232,216 men, representing 50.06% of the total, compared to 6,215,959 or 49.93% women.

Like many of the world’s developing countries (it ranks 163 out of 169 countries on UNDP’s 2010 Human Development Index), Chad’s population is increasing rapidly – more than 3 per cent annually. That amounts to a doubling about every 20 years. This is occurring in spite of the country’s high mortality: half the population dies before the age of 50. With a large youth contingent -- more than half (57 per cent) of Chad’s population is under 18, the population will continue to grow rapidly, even if fertility declines substantially from the current average of 6.3 children per woman. Chad’s population density was measured at 10 inhabitants per square kilometer, but this figure hides significant disparities: 43 per cent of Chad’s population 11 per cent of the total country area, the southern region has a humid climate.

1 Chadian Ministry of Health, monthly report, 2007
2 Ouaddai region profil, OCHA November 2012
3 MICS Multiple Indicators Survey, 2010
4 2010 United Nations Development Programme (UNDP) Human Development Index
5 Meanwhile, the large strips of land in the Saharan North are barely populated: the Borkou, Ennedi and Tibesti regions have less than 1 inhabitant per square kilometer, mostly nomadic pastoralists, who now only account for around 3.5 per cent of the total population compared to 5.6 per cent in 1993. One explanation for their dwindling share of the population is that recurrent drought has forced herdsmen to settle in areas more conducive to their survival.
CHADIAN ADMINISTRATIVE MAP WITH OUADDAI REGION UNDERLINED IN RED

Map adapted from the Department of Field Support, Cartographic Section of United Nations, March 2009.

5 MICS Multiple Indicators Survey, 2010
HEALTH SYSTEM IN CHAD

Chadian health system is pyramidal with 3 levels: a central level, intermediate level and peripheral level. The health district constitutes the unit for this health system.

THE CENTRAL LEVEL

It includes a National Health Council, the central services of the Ministry of Health, national programs, national institutions, including the National General Referral Hospital (HGRN), the Faculty of Health Sciences (FACSS), the National School of Health and Social Agents (ENASS) and Pharmaceutical Purchasing Centre (CPA). The central level is in charge of the design, monitoring and evaluation and implementation of national health policies and program, supervision, external Aid coordination.

THE INTERMEDIATE LEVEL

The intermediate level is composed of Regional Health Councils, 23 Sanitary Regional Delegations (DSR) modeled on Administrative Regions, public regional hospitals (regional referral hospital), The Regional Supply Pharmacies (PRA), and the Regional training Schools. The intermediate level is responsible for the health policy implementation in the regions. It provides technical support to the peripheral level.

THE PERIPHERAL LEVEL

It is composed of District Health Councils (managed by the District management team), Health Districts (DS) divided into Health Zones (HZ) and District hospitals and health centers, located in the administrative catchment area.

The peripheral level is responsible for the policies and activities at central and intermediate levels. The health center offers the minimum package of activities (MPA) which includes preventive, curative and promotional components, while the district hospital provides additional package, i.e. the obstetric and neonatal care.

According to the 2011 statistical yearbook, Chad has currently:

- 23 Regional Sanitary Delegations (DSR),
- 103 Health Districts from which 72 are functional;
- 1290 Health Zones from which 1037 are functional.
Health system actors and Maternal and neonatal Health related Indicators

The health system involves several actors that can be divided into the following categories:
- The public or state sector;
- The private sector (cabinets, clinics);
- Multilateral and bilateral organizations;
- The voluntary and / or religious sector;
- The population.

HEALTH HUMAN RESOURCES

The number of health personnel in activity does not yet meet the demand to cover the population health needs. The needs assessment in Emergency Obstetric maternal and Neonatal Care services done in 2011 revealed a deficit in medical and paramedical staffs. The country had 19 obstetricians, 6 pediatricians, 374 medical doctors, 2,074 nurses and 282 midwives only. In terms of ratio, Chad has 1 doctor for 31,735 inhabitants, one nurse for every 5,779 inhabitants and one midwife per 9,596 women of childbearing age. All these ratios are below the minimum recommended by the WHO (e.g., 2.5 health workers per 1000 inhabitants).

With regards to this, the Minister of health (MoH) and its partners have developed a number of initiatives and strategies, such as raising the staff recruitment in the public service, health staff training, decentralization and the creation of Health Schools at Regional Sanitary Delegations and Social Affairs, the licensing of private training Institutions. Moreover, the agreement signed between the Government and the technical and financial partners of the health sector in November 2011 has put priority on the issues pertaining to human resources.

FINANCIAL HEALTH RESOURCES

The Pan African Conference of Heads of State in Abuja in 2001 urged African governments to allocate 15% of their overall budget to the health sector to provide the means of achieving the 2015 Millennium Development Goals (MDG) related to health. From 2007 to 2013, the budget allocated to health sector had ranked between 5 and 9% which remains low than the target of 15%.

MATERNAL MORTALITY

DEFINITION
The Maternal mortality synonymous of maternal death is defined as follows: “The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.”

According to the WHO and in order to facilitate the identification of maternal deaths in circumstances in which cause of death attribution is inadequate, a new category has been introduced: “Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.”

**LATE MATERNAL DEATH**

The death of a woman from direct or indirect obstetric causes, more than 42 days, but less than one year after termination of pregnancy.

**RATIONAL MEASURE**

In order to standardize the maternal death measurement worldwide, the ratio has been the way to come about it. Consequently, the maternal death ratio represents the number of maternal death which occurs in a specific area out of 100,000 live births, it shows the risk associated with each pregnancy. It is important to note that measuring the maternal death accurately remains quite difficult especially in some developing countries where registration of death and his cause does not exist. In such countries; surveys and census have to be used in tentative of estimating the maternal mortality.

**MATERNAL MORTALITY WORLDWIDE**

In reference to the WHO key facts; every day, approximately 800 women die from preventable causes related to pregnancy and childbirth. Young adolescents face a higher risk of complications and death as a result of pregnancy than older women.

10 The International Code of Diseases (ICD-10) Abstract
11 International Classification of Diseases, 10th Revision, Geneva, World Health Organization, 2004
12 International Classification of Diseases, 10th Revision, Geneva, World Health Organization, 2004

Skilled care before, during and after childbirth can save the lives of women and newborn babies. Between 1990 and 2010, maternal mortality worldwide dropped by almost 50%.

The study conducted by the WHO demonstrates that “there is a gap between maternal death in rich and poor countries. Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one third occur in South Asia. The maternal mortality ratio in developing countries is 240 per 100,000 births versus 16 per 100,000 in developed countries. There are large disparities between countries, with few countries having extremely high...
maternal mortality ratios of 1000 or more per 100 000 live births. There are also large disparities within countries, between people with high and low income and between people living in rural and urban areas“.13

MATERNAL MORTALITY IN CHAD

Different studies and health data from the Chadian MoH Health Information System have shown that indicators of morbidity and maternal & neonatal mortality in Chad are among the highest in the world. Therefore, the rate of maternal mortality was 827 per 100,000 live births in 1997 (EDST I), rose to 1.099 in 2004 (EDST II) and to 1084 in 2009 (RGPH2) and finally to 1100 for 2012. The Obstetric and Neonatal Care Emergency assessment report in Chad (2011) found that the top five direct obstetric causes of maternal death.

The Top direct obstetric causes of maternal mortality in Chad, 2011.

1. Hemorrhage - 34%
2. Postpartum infections - 33%
3. Eclampsia/Pre eclampsia - 11%
4. Prolonged obstructed labour - 7%
5. Abortion complication - 5%
6. Autres causes - 10%


The underlying causes of this high mortality are: poverty, low literacy rate of women, poor access to health care services (the poor roads condition and insufficient means of transport, inadequate telephone network, the greatness of the country), socio-cultural and religious impediments, the status of women (and economic decision-making etc. dependence) and a weak health system.

In her speech during the launch of CARMMA (The Campaign for Accelerated Reduction of Maternal Mortality) 25th October 2009, Mrs. Hinda Dédy Itno, the first lady of Chad emphasized additional causal factors of maternal mortality in Chad such as; the inequality between the sexes and the denial of women’s sexual rights, violence against women in all its forms, the high fertility rate, young marriages and unwanted pregnancies.14

OUADDAI HEALTH REGION CONTEXT

LITERATURE REVIEW

One of the critical health issue Chad is facing since a decade is the maternal mortality at the extent of being ranked among the top five countries with the highest Maternal Mortality ratio. A certain number of studies have being contacted in the country as a whole. None of them have focused on the
MMR in a particular region such as Ouaddai. Given the specificity of this region hosting many Sudanese refugees since 2004, where Humanitarian NGOs have been operating health facilities with the support from UN agencies and other donors, hence the decision of contacting this research study.

The overall goals of this study is to establish first the comparison between the Ouaddai region and the National MMR as presented by some researchers, second compare the MMR recorded in Ouaddai MoH health facilities and NGOs supported health facilities. This research study will highlight the impact of health NGOs assistance in the region as a contribution in meeting the sixth Millennium Development Goal related to MMR reduction by three quarters by 2015.

Previous studies that have tried to broach the MMR analysis in the country used retrospective, descriptive and Transversal methodologies. Most of them were limitative in the population of study. Only health facilities with ten or more deliveries in a month were taken into account missing a certain number of health facilities. But in our present study, statistics were compiled from all health facilities that endow this research study with a certain credential.

Women in Chad face a lifetime risk between 1 in 11-14 of dying due to complications arising from child birth. In Chad, conditions have never been good, but the maternal mortality has actually increased in the last decade compared to the rates in 90’s. Approximately Maternal death ratios are 1100 deaths per 100,000 live births.

LOCATION

The Ouaddai Region is composed of three Departments namely: Ouara, Assoungha and Abdi. It stretches over an area of 29,940 Km2 and bordered in the North by the Wadi Fira Region, in the East by Sudan, in the South by Dar Sila and on the West by the Republic of Sudan. Ouaddai counts 912,593 inhabitants divided between the main ethnic groups which are: Ouaddaiens, Goranes, Zaghawas, Massalites, Peuls, Haoussas, Tamas, For and Arabs.

HISTORY AND SPECIFICITY OF THE REGION

The Ouaddai Region has 4 health districts (two functional) and 60 health centers (48 operational). According to the estimates, for Abeche the Ouaddai Head town, the average is a doctor for 245,450 people and one nurse for 11,320 persons whereas the WHO standards require 1 doctor for 10,000 inhabitants and 1 nurse State diploma for 5,000 persons. Marked by regular attacks of rebel groups, incursions of the armed militias named janjawids from neighboring Sudan as well as from intergovernmental conflicts since year 2003, the Eastern part of Chad hosted thousands of Sudan refugees, particularly in the Ouaddai Region where Sudan refugees were gathered within four refugee camps namely: Farchana, Gaga, Bredjing and Treguine.

Since the settlement of these Refugee camps, quality health care have been provided to refugees and host communities by International and national NGOs operating in the Region with the financial
support from UNHCR and other donors.

15 EmoC need Assessment report, Chad 2011 16 Save the Children, 2006
17 African Development Bank, Gender Poverty and Economic Indicators on African Countries, Economic and Social Statistics Department: Tunis, Tunisia, 2007.
18 Chad CEDAW, 20, October, 2010, 02, March, 2012) 9, 38, 53
19 Figure extracted from the Abeche Regional health office report, July 2012 20 OCHA November 2012, Bulletin

The major health problem recorded in the whole Region is not only in terms of infrastructure and equipments alone but also in term of qualified health personnel, drugs and other medical supplies. The International Rescue Committee (IRC), BASE (Office for Environment and Health Support), are NGOs providing health assistance in the four refugee camps and host communities. In order to improve on pregnant women health as well as to Infant, the Maternal and child Health activities were integrated into the minimum initial package of health services provided by the above mentioned NGOs in the Region. We believe that the health support provided by NGOs has played a key role in maternal death reduction in the Ouaddai Region hence the motive for this research which will focus on four years retrospective data analysis starting from November 2010 to October 2013.

OBJECTIVES AND METHODOLOGY

GENERAL OBJECTIVE

The purpose of our study on this particular theme consists of determining the portion of health facilities related maternal death in Ouaddai region where health care has been provided by the MoH and Non Governmental Organization (NGOs) compared to the maternal mortality ratio found in the whole country.

SPECIFIC OBJECTIVES

This study being applied on the Chadian Ouaddai Region would like to demonstrate the MMR status by:

1. Determining the MMR in the Ouaddai MoH health facilities.
2. Determining the MMR in the Ouaddai NGOs supported health facilities (refugee camps health facilities)
3. Comparing the MMR obtained from both MoH and NGOs supported health facilities.
4. Comparing the MMR from Ouaddai region health facilities to the Chadian National MMR.
5. Analyzing reasons to be attributed to the differences found between the MMR in Ouaddai Health facilities and the NGOs supported health facilities.
6. Analyzing the reasons to be attributed to the differences found between the MMR in Ouaddai health facilities as a whole and the Chadian National MMR.
RESEARCH DESIGN

The data used in this study is the fruit of retrospective information collected from UNHCR Health Information System and the Ouaddai MoH database. The research will be based on the quantity of the health information collected endowing the study with the characteristic of a quantitative research. This research study focuses on Ouaddai region, using data from three health districts which composes Ouaddai region.

With this research study we expect to display conclusion emphasizing on the quality of health provided to women in health facilities managed by the MoH and by NGOs in refugee camps. Therefore, the maternal mortality rate in those health facilities is supposed to be the lowest as possible in comparison with the national statistics. Also, the MMR in NGOs supported health facilities is supped to be lower than in health institutions managed by the MoH.

PROCEDURES

DATA COLLECTION

The data used in this study was collected from official tools of UNHCR (HIS) and the Ouaddai MoH database. The participants involved in this research are mainly health information system personnel from the Chadian Ministry of health and the United Nations for High Commissioner for Refugees (UNHCR) with its NGO partners in the region at the rate of 2 persons from MoH, 2 from the UNHCR, 2 from IRC and 1 from BASE with for a total of 7 personnel. Once extracted from the tools mentioned hereby, the information was inserted in a table created purposely to allow calculation on the maternal mortality segregated by year and by the category of the health facility which may be located in the refugee camps or in the National communities.

DATA ANALYSIS:

The analysis made on the collected data was done after the calculation of the maternal mortality ratio using the following formula:

\[
\text{Maternal death} \div \text{Number of live birth (denominator)} \times 100,000 = \text{Live birth (numerator)}
\]

The result obtained will be object of comparison between the NGOs (refugee camps) health facilities.
and the health facilities in charge of the MoH. Second the comparison will be made between the compiled health facilities maternal mortality ratio from Ouaddai and the Chadian National statistics.

RESULTS AND DISCUSSION

RESULTS

Using the above maternal mortality ratio calculation formula, the result recorded for Ouaddai health facilities was 159.5 deaths out of 100,000 live births which is lower than the Maternal mortality of 1100 deaths out of 100,000 live births as recorded for the whole country in 2012. Also, the MMR recorded in NGOs supported health facilities (60.2 deaths/ 100,000 live births) was lower than the one recorded in the Ouaddai MoH’s health facilities (101.6 deaths/ 100,000 live births).22

The analysis of reasons to be attributed to the difference found in the MMR between the three locations are presented in the discussion paragraph.

It is important to clarify the fact that the data collected from the MoH at the Health Regional level was not complete, lacking 2 months data. Given the fact that the trend of the annual data recorded is quite the same without much variation, we guess that this will not affect significantly the final result displayed in this paragraph.

22 Find the data collection tools in annex paragraph with data originated from UNHCR HIS and the Ouaddai Health Region database, January 2014.

Statistics for Ouaddai MoH’s health facilities

<table>
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<tr>
<th>Indicator</th>
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Statistics summary for all Ouaddai health facilities

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<td>46.7</td>
<td>115.7</td>
<td>55.0</td>
<td>184.4</td>
<td>101.6</td>
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DISCUSSION

In the light of the result hereby, we can notice that Ouaddai health facilities had a maternal death 101.6 deaths out of 100,000 live births which is 10.8 times lower than the one recorded for the whole country (1100 deaths/100,000 live births). This difference can be attributed, first to the presence of NGOs operating health facilities in the refugee camps which might contribute to increase health care accessibility for pregnant women from the host communities surrounding the refugee camps; second to the financial and training supports given to Ouaddai health facilities by UN agencies such as UNHCR, UNICEF, UNFPA and WFP.

Likewise, the NGOs supported health facilities (refugee camps) were recorded a MMR of 60.2 deaths out of 100,000 live births which is 2.64 times lower than the one recorded in the Ouaddai MoH health facilities (159.5 deaths/100,000 live births). This situation can be attributed to the breach of standards in Ouaddai MoH health facilities as follows:

- Lack of qualified staffs: In term of Medical personnel in Ouaddai the need was estimated at 27. Only 10 Medical personnel were available in 2012 representing 37%. The corresponding need was 17 medical personnel which represents 63% as the gap in medical staffing. Concerning midwives, only 11 were available out 97 (11%) with a gap of 86 midwives representing 89%.

- Lack of equipments: One health district hospital not operational due to absence of equipments, Ouaddai region has only 2 ambulances out of 4, 24 refrigerators for routine immunization available out 57 representing 58% of gap to be filled in terms of refrigerator.

- Poor infrastructure and maintenance (25 Health Centers and 3 District Hospital to be reconstructed out of the 66 MoH Health care institutions in Ouaddai Region)

- Insufficient health facilities in Ouaddai Region (48 Health facilities are operational out of 66 which is translated into 72% of operational health facilities as well as the long distance between health centers and the Districts referral hospital which was estimated with a mean of 58 km)

We can easily understand that the high maternal mortality ratio of 2012 may be allotted to the death that occurs in the community given the few number of health facilities and lack of qualified health personnel in the Country Chad.

Therefore, a maternal death analysis at the community level is recommendable to confirm the
assumption regarding the place maternal death took place in Ouaddai region. This assertion leads us to the statement that most of the maternal mortality death in the region’s health facilities may be due to the first and second delays. The first delay referring to “the delay in seeking appropriate medical help for an obstetric emergency for reasons of cost, lack of recognition of risk factors and emergency, poor education, lack of access to information and gender inequality” while the second delay stands for “the delay in reaching an appropriate facility for reasons of distance, infrastructure and transport”.  

CONCLUSION

Despite the difficulties encountered during the course of this study, we noticed that the maternal mortality found in Ouaddai region was lower than the one recorded for the country Chad. We strongly guess that this difference may be attributed to the presence of many humanitarian NGOs operating health facilities in the Region coping with international standards and serving host communities alongside with Sudanese refugees. The presence of health center in refugee camps have likely increase health accessibility for pregnant women living in Ouaddai Region.

In parallel, the refugee camps health facilities managed by NGOs had a lower MMR than the one found in Ouaddai MoH health facilities this can be attributed successively to the attractive quality of health care services provided in the refugee camps and the tremendous gaps noticed within Ouaddai MoH health facilities.

Believing in the data collected from the different databases, we can understand that the higher rate of maternal death recorded for Chad as a country might be due to maternal deaths occurring in the community away from the sight of clinicians. It can be a challenge for medical certifiers to attribute correctly cause of death to direct or indirect maternal causes, or to accidental or incidental events, particularly in settings where deliveries mostly occur at home.

RECOMMENDATION

Given the fact that the actual research slammed the problem of Ouaddai MoH Health facilities at three levels as follows:

1. Qualified staffs
2. Lack of Health centre infrastructure and equipment.
3. Health accessibility in term of distance between the communities and the nearest health facility especially in rural zones. We have to recognize the notably effort that have been made to address the problems hereby mentioned.

25 Second Demographic Health survey in Chad, 2012
In order to contribute in reducing maternal mortality in the Ouaddai region, we would like to recommend a profound analysis of maternal mortality at the community level. This will absolutely permit to understand better the problematic of the maternal death particularly in rural zones using variety of information sources like censuses, household surveys, reproductive-age mortality studies and verbal autopsies.

Solution to the disparity and MMR related issues among the Ouaddai region and all the country should be context specific and focusing on remote rural areas where pregnant women don’t have enough access to health care services.

**Graphs used to collect data.**

**2010 Deliveries**

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**References**

1. Chad Country Profiles, World Health Organization
   http://www.who.int/gho/maternal_health/countries/tcd.pdf?ua=1
http://www.unicef.org/infobycountry/chad_statistics.html


http://data.worldbank.org/indicator/SH.STA.MMT


http://www.who.int/making_pregnancy_safer/topics/maternal_mortality/en/


11. Survey by clusters with multiple indicators (MICS)


17. EmoC need Assessment report, Chad 2011.
ATTITUDE AND BEHAVIOUR OF USERS OF MOTORCYCLE TOWARDS THE USE OF CRASH HELMET IN ADO-EKITI, NIGERIA.

A Case Study By Dr. Pius Izundu Okpoko, Nigeria (MBBS, PhD in Public Health Student of Texila American University)

Email id:- supfaith2000@yahoo.com

ABSTRACT

OBJECTIVE - To determine the attitude and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.

STUDY DESIGN - this is a cross-sectional study design that made use of quantitative survey method involving data collection and analysis.

PARTICIPANTS - 283 voluntary adults who were randomly recruited within Ado-Ekiti metropolis.

METHOD - a semi-structured questionnaire was administered to participants who also consented to the survey. A cross-sectional study was employed in this research to enable any desired data to be collected at one point in time.

RESULTS – There were 283 returned and analyzable questionnaires out of 321 questionnaires administered. The modal age group was 21-30 years (42%). There were more males, 209 (73.9%), than females, 74 (26.1%). Majority of the respondents were single (55.1%). This was followed by respondents who were married (41.0%). A total number of 16 (5.7%) respondents only had primary education, 126 (44.5%) secondary education, 113 (39.9%) tertiary, while 28 (9.9%) had no formal education. Students, 92 (32.5%), were the majority of the respondents. Two hundred and forty respondents (84.8%) believed that it is necessary to use crash helmet, while 43 (15.2%) did not believe that it is necessary. The frequency of self-reported helmet use was 171 (60.4%), while 112 (39.6%) had never used helmet. Seventy percent of respondents believed that helmet use should be made compulsory for users of motorcycle. Various reasons for non use of helmet include too heavy 99 (35.0%), fear of contracting disease 93 (32.9%), not protective 24 (8.5%), and other reasons not included in the options 6.7 (23.7%).

CONCLUSIONS – This study highlighted that a far greater number of respondents believed that the use of crash helmet is necessary for safety and should be made compulsory. Nevertheless, the discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet usage were the main negative factors militating against helmet usage.
GLOSSARY:

**ATTITUDES** – they are mental habits acquired from social experiences that predispose individuals to react to situations, persons or specific objects in a definite way. An attitude is deemed an enduring system that includes a cognitive component, an emotional (feeling) component and an action tendency (TAU, 2014).

**HEAD INJURY** – this is a damage to any of the structures of the head as a result of trauma. While the term ‘head injury’ is most often used to refer to an injury to the brain, head injuries may also involve the skin (scalp), skull, muscles, blood vessels, and other organs of the face or head. A head injury does not always mean that there is an associated brain injury (MedicineNet.com, 2014).

**HELMET** - a motorcycle helmet is a type of protective headgear used by riders of motorcycles and pillion passengers. The essential goal of a crash helmet is motorcycle safety; to offer protection to the rider's head in an event of accident, thus preventing or reducing head injury or saving the rider's life (Wikipedia, 2010).

**INFORMED CONSENT** – this is the principle that guides that participants in a study should be informed about the risks involved in a study; its benefits and purposes also, as they affect their participation before they decide whether or not to be involved, and this planned participation should be entirely voluntary (Green and Thorogood, 2009).

**PILOT STUDY** – this refers to a mini study which is conducted in preparation for a planned project; essentially to test an aspect of the study design, e.g. in a quantitative study, and to allow necessary adjustment to be made prior to final commitment to the design (AQR, 2011).

**POSITIVISM** – this refers to epistemological research approach that tends to assume that a stable reality exists which essentially can be known and also understood through empirical methods (Green and Thorogood, 2009).

**QUESTIONNAIRES IN SURVEYS** – they are widely used tools for obtaining information (data) for analysis during research study.

**SOCIAL DIAGNOSIS** – it is made through socio-medical surveys and by researching into domestic and social conditions of individuals (TAU, 2014)

**VARIABLES IN RESEARCH** – they are basically grouped into two: independent (explanatory) variable and dependent (response or outcome) variable.

**KEY WORDS**

Attitude, Behaviour, Crash helmet, Head injuries, Motorcycle, Users.
INTRODUCTION

Motorcycle is used in this part of the world for several reasons which include commercial purposes, private and pleasurable means of easy commuting. As a means of transport, motorcycle became very popular in Nigeria from late 1980s owing to decreasing employment rate and economic downturn. Commercial motorcycle, which is commonly known as ‘Okada’ in Nigeria, is a major source of income for a sizeable number of unemployed populace. It is also a major cause of head injuries following a road traffic accident. Peden et al (2004) observed that the main risk factor for severe head injury among commercial motorcyclists and their passengers is non-use of crash helmet. Injuries and fatalities resulting from motorcycle accidents are a growing public health problem in developing countries (Sood, 1988). Falope (1991) noted that relatively few developing countries have enacted and are enforcing motorcycle helmet laws.

There is a major and growing public health concern in preventing serious injuries and deaths from motorcycle crashes. It was estimated that motorcycle accidents claimed 4,502 lives in 2010, while motorcycle-related deaths increased by 55% since year 2000 (CDC, 2014). The Centre for Disease Control and Prevention (2014) observed that an estimated 37 per cent of crash deaths among motorcycle riders and 41 per cent of crash death for motorcycle passengers are preventable through the use of crash helmets. The conclusions of Hurt reports (published over three decades ago) indicated that the single critical factor in the prevention and/or reduction of head injury is the use of a safety helmet (SMARTER, 2014). Additionally, Hurt reports submitted that the use of crash helmet is an effective countermeasure to head injury, and helmeted riders and passengers are significantly protected from head and neck injury during crashes.

In Ado-Ekiti, Nigeria, several efforts are geared towards encouraging Okada riders and their passengers to imbibe the positive culture of constant use of crash helmet. Some of the major setbacks include non-adherence to available motorcycle helmet laws, inability on the part of law enforcement agents to enforce the laws and difficulty in bringing about behaviour change because of non-sustenance of public health campaign. Education is deemed a determinant of knowledge, attitude, and value system of individuals (TAU, 2014). This study seeks to determine the attitudes and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.

THE OBJECTIVES OF THIS STUDY ARE:

1) To determine the attitude and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.
2) To review Literature on the use of crash helmet and related-accidents in West African sub-region.
GENERAL CONSIDERATIONS

LITERATURE REVIEW:

STUDIES ON MOTORCYCLE ACCIDENTS AND HELMET USE.

Various literatures have visited general issues relating to road traffic accidents and their untoward impact on life. Other related studies took a deeper course into motorcycle accidents and the use of crash helmet as a preventive measure to reducing severity of head injury. Akinlade (2000) while researching on the knowledge, attitudes, and practices of road safety and first aid among commercial motorcyclists in a district of Oyo State, Nigeria, noted (from the public health point of view) that road traffic accidents have been recognized as a worrisome health problem in both developing and developed countries.

He further submitted that there is an increasing rate of road traffic accidents in developing countries like Nigeria, but a reduction in the developed world. In consonance with the study done by Ogbide et al (1994) it was noted that some major causes of road traffic accidents can be attributable to human errors and inabilities, adverse road conditions, poor road signs and mechanical defects of vehicles. Furthermore, the age of the motorcyclist, general medical and mental fitness of the rider, degree of alcoholic consumption and educational level of the motorcyclist, all serve as most important human factors in road traffic accidents (Lin et al, 2003; Sexton et al, 2004; Elliot, Baughan and Sexton, 2007).

Adewale (2009) in his write up observed that wearing an approved, correctly-fitting-standard, crash helmet while riding a motorcycle helps to reduce head or neck injury and also increases a rider’s chances of surviving a crash. He also noted that, on the contrary, users of motorcycle do give flimsy excuses for not using crash helmet and prefer using improvised helmets like dried pumpkin shells or empty paint plastic keg to avert disturbance from law enforcement agents. Some excuses that are often heard from users of motorcycles include high risk of contracting infection from helmets and the inconveniences associated with the usage of crash helmets (Salaudeen et al, 2012).

HEAD INJURIES; A LEADING CAUSE OF MORTALITY AND DISABILITY

Head injuries sustained, following a road traffic accident, have been implicate as a major cause of death and disability among users of motorcycles. The World Health Organisation (2006) observed that head injuries result in much higher medical costs when compared with other types of injuries. Importantly, the social costs of head injuries for survivors, their families and communities are very high. This is owing to the fact that they frequently require long term care and specialised medical care during the management of the cases. Moreover, there is a resultant negative impact on the country’s health care costs and the general economic situation. WHO (2006) indicated that in some low-income and middle-income countries head injuries are estimated to account for up to 88% of deaths among motorcycle users. In European countries,
they contribute around 75% of such fatalities (WHO, 2006). It is known that these mortalities and disabilities can be prevented through judicious use of crash helmet by motorcycle users (Salaudeen et al, 2012). In West African region, there is an upward trend in the number of motorcycle users both for commercial and recreational purposes.

MOTORCYCLE HELMET LEGISTRATION TO INCREASE USE IN NIGERIA

It is known that laws that demand the strict use of crash helmets while riding motorcycle increases their use (Braddock et al. 1992). Consequently, injuries from motorcycle accidents, death and medical costs are reduced. A fewer number of motorcyclists (less than 50%) wear helmets in Nigeria and some other West African countries when they are not compelled by law, while compliance improves dramatically when the laws are in effect and are adequately enforced (Adewale, 2009). In Nigeria, the Federal Road Safety Commission is the body that sees to adherence to road safety laws. Also, the traffic police officers contribute to the enforcement of the crash helmet law in the country. Meanwhile, various laws had been enacted at different times by the Local, State and Federal governments of Nigeria to curb the untoward excesses of motorcycle riders but sustained implementation of the said laws has always been a challenge. Examples of such laws include the National Road Traffic Regulation of 2004 and FRSC Establishment Act 2007.

THE HEAD, ITS DELICATE CONTENTS AND INJURY

The brain is a very fragile organ which is encased within the skull. Just behind the skull, and adherent to it, is a tough, fibrous membrane called dura mater. There are other coverings of the brain (meninges) which are the arachnoid mater and the pia mater as we approach the brain from the bony skull. The cerebrospinal fluid bathes and cushions the brain and the spinal cord.

In an event of a motorcycle accident without a crash helmet, there could be an open or a closed injury which ultimately can damage the coverings of the brain and the brain, itself. It is worth noting that most traumatic brain injuries are of closed type with a resultant haematoma in most cases. Crash helmet serves as an additional protective layer to the head and its delicate contents. Motorcycle riders who do not wear a crash helmet run a much higher risk of sustaining head and traumatic brain injuries.

BRINGING BEHAVIOUR CHANGE THROUGH SOCIAL MARKETING

Non-adherence to traffic laws governing crash helmet use is a major factor implicated in head injury resulting from motorcycle accident (Oginni, Ugboke and Adewole, 2007; Ogunmodede et al, 2012). The users of motorcycle do give flimsy excuses for not using crash helmet and prefer using improvised helmets like dried pumpkin shells or empty paint plastic keg to avert disturbance from law enforcement agents (Adewale, 2009). These materials do not prevent traumatic impact to the brain that can result to head injury in cases of accidents. In a drive to bring behaviour change in situations of harmful behaviour, social marketing has been suggested.
TAU (2014) described social marketing as the process of motivating people (through application of marketing techniques) to voluntarily adopt behaviour which is beneficial to them. The adoption of beneficial behaviour is considered over potentially harmful ones. This applies to the use of crash helmet by motorcycle riders which serves a huge benefit to them. Meanwhile, it is worth noting that a slogan of the Public Awareness Campaign (PAC) that strives to increase helmet-use rates and improve traffic safety knowledge throughout Vietnam is ‘Wear A Helmet. There Are No Excuses’. This seeks to decrease traffic accident fatalities and modify road safety behaviour.

**METHODS:**

**LITERATURE SEARCH STRATEGY:**

Efforts were geared towards thorough literature search, and the search was conducted in order to identify the following:
(a) Literature on the use of motorcycle crash helmet and related-accidents in West African sub region.
(b) Available data on motorcycle accidents in sub-Saharan Africa, especially, West African region
(c) Literature on attitude, perception and use of crash helmet.
The literature search was done to cover the period, 1980 – 2014, for all related publications in English language.
Electronic searches for information/data bases such as EBSCO, PUBMED, Cochrane library, and also some international organisations, like WHO, were carried out. Searches were done using some key words as seen below (Box 1).

**STUDY SETTING:**

The present study was carried out at randomly selected motorcycle parks and busy locations in Ado-Ekiti metropolis where people commute on daily basis. The subjects were motorcyclists and other users of motorcycle who were randomly selected.
ETHICAL CLEARANCE:

Necessary basic procedure was observed in obtaining ethical clearance. Also, written consent (in form of a ‘ticked consent’) was obtained from the participants after due explanation of the survey and assurance of anonymity and confidentiality.

STUDY DESIGN:

This was a cross-sectional survey that made use of semi-structured, pre-tested questionnaire which was given to volunteers to complete.

EPISTEMOLOGICAL APPROACH:

The research was a quantitative study that assumes positivism. It is known that positivism shapes reality to be objective and combines a deductive approach with precise measurement of quantitative data to predict human behaviour (Neuman, 2000).

INCLUSION CRITERIA:

Voluntary adults and younger age groups who gave their consent.

EXCLUSION CRITERIA:

Children who are not independent to commute with motorcycle. Those with severe mental/psychiatric illness were also excluded.

SAMPLE SIZE ESTIMATION:

The sample size was calculated using the simplified formula by Glenn (1992):

\[ n = \frac{N}{(1 + Ne^2)} \]

Where \( n \) = sample size, \( N \) = population size, and \( e \) = the level of precision required. The estimation assumed accuracies of 95% confidence interval and a 5% significance level. The study required an estimated 321 respondents.

DATA COLLECTION:

The researcher and trained assistants distributed the questionnaire and collected data within the month of August, 2014. The content of the questionnaire was carefully translated in local
language to participants who were unable to read English without altering the meaning of each question.

RESULTS and DISCUSSION:

There were 283 complete and analyzable questionnaires out of 321 questionnaires administered. The modal age group was 21-30 years (Table 1 and Figure 1). This is similar to the study done by Oginni, Ugboko and Adewale (2007) who noted a peak age of 25-29 years. In another related research carried out by Ogunmodede et al (2012) in Oyo State, Nigeria, the modal age group was 26-30 years and was closely followed by 20-25 years. This agrees with the findings that the number of users of motorcycles, including motorcycle-related accidents and injuries, are predominantly high within this age group (Emejulu et al, 2010; Oluwadiya et al, 2004; and Ogunmodede et al, 2012).

There were more males, 209 (73.9%), than females, 74(26.1%), in the present study (Figure 2). Majority of the respondents were not married (single). They constitute 55.1% (156 out of 283) of the returned and analyzable questionnaires (Figure 4). This is followed by respondents who were married, 116(41.0%). A total number of 16(5.7%) respondents only had primary education, 126(44.5%) secondary education, 113(39.9%) tertiary, while 28(9.9%) had no formal education (Figure 5). Students, 92(32.5%), were the majority of the respondents, but closely followed by employed 90(31.8%) and not-employed 80(28.3%), while apprentice constitutes 21(7.4%).

Out of the 283 respondents in the study, 240(84.8%) believed that it is necessary to use crash helmet, while 43(15.2%) did not believe that it is necessary. Males in the affirmative constitute 88.0%, while 12.0% had a negative response. On the other hand, 75.7% among the female respondents believed in the necessity of helmet usage but 24.3% declined. The frequency of self-reported helmet use was 171(60.4%) of the entire respondents, while 112(39.6%) had never used helmet. In consideration of gender, Hung, Stevenson and Ivers (2006) observed that men are more likely to use a crash helmet than women. On the contrary, Ichikawa, Chadbunchachai and Marui (2003) reported the reverse. Both studies were done outside Nigeria. Statistically significant difference in helmet use was obtained between males and females in this study (p=0.034).

Meanwhile, the returned questionnaires also revealed that out of the respondents that admitted that they had used crash helmet, 57(33.3%) always use helmet, 75(43.9%) occasionally use helmet and 39(22.8%) rarely use helmet. There was no statistical significance between literacy and the use of helmet and the frequency of usage (p>0.5). Various reasons for non use of helmet include too heavy 99(35.0%), fear of contracting disease 93(32.9%), not protective 24(8.5%), and other reasons not included in the options 6.7(23.7%) – see figures 3 and 6. The discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet usage were the main negative factors militating against helmet usage. Salaudeen et al (2012) made a similar observation while investigating on passengers’ attitude and behaviour towards motorcycle helmet use in Ilorin, Nigeria.
CONCLUSION:

This study highlighted that a far greater number of respondents believed that the use of crash helmet is necessary for safety and should be made compulsory. Nevertheless, the discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet usage were the main negative factors militating against helmet usage. Statistically significant difference in helmet use was obtained between males and females in this study (p=0.034).

RECOMMENDATIONS:

Following the findings in this study, it would be advisable to improve on the available educational interventions that will help to bring about behavioural change as regards the use of crash helmet.

Provisions should be made by various arms of government to engage the youths in more meaningful occupation, and also create safer means of intra-city transportation for the teeming population.

TABLES AND FIGURES:

Table 1: Age group distribution of the study population.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=20</td>
<td>55</td>
<td>19.4</td>
</tr>
<tr>
<td>21-30</td>
<td>119</td>
<td>42.0</td>
</tr>
<tr>
<td>31-40</td>
<td>70</td>
<td>24.7</td>
</tr>
<tr>
<td>41-50</td>
<td>30</td>
<td>10.6</td>
</tr>
<tr>
<td>51 and above</td>
<td>9</td>
<td>3.2</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 2: Distribution of literacy level and the necessity to use crash helmet.

<table>
<thead>
<tr>
<th>Present educational status</th>
<th>Count</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>3</td>
<td>13</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>18.8%</td>
<td>81.3%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>15</td>
<td>111</td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>11.9%</td>
<td>88.1%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Tertiary</td>
<td>19</td>
<td>94</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>16.8%</td>
<td>83.2%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>22</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>21.4%</td>
<td>78.6%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>240</td>
<td>283</td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>15.2%</td>
<td>84.8%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1: Age group distribution of respondents.

Figure 2: Distribution of sex of the respondents.
Figure 3: Reasons for not wearing helmet.

- Too heavy: 40%
- Not protective: 10%
- Fear of contracting disease: 35%
- Others: 20%

Figure 4: Marital status of the respondents.
Figure 5: Distribution of literacy of the respondents.

Figure 6: Reasons for not wearing helmet.
REFERENCES


ROAD TRAFFIC ACCIDENTS, NATIONAL DEVELOPMENT AND PUBLIC HEALTH IN CONTEMPORARY NIGERIA: ANALYTICAL STUDY OF PLATEAU STATE 2006-2013.

A Case Study By Mr. Edward Eziokwu Egede, Nigeria

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ABSTRACT

The increasing level of road traffic accidents in Plateau State and the consequent injuries and deaths strengthened the case for its regular analysis. There is a generally increasing incidence, morbidity and mortality rates of road traffic accidents. Majority of mortalities and morbidities occur in developing Countries. Worldwide, road traffic accidents lead to deaths and disability as well as financial cost to both society and the individual involved. The causes of road traffic accidents are not just human error or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world. Road traffic accident in Plateau State, Nigeria has not received the attention warranted. Reviewing literature on road traffic accidents and their impact and using the time-series description method, road traffic accidents showed an upward trend and significant seasonal influences.

Using chi-square test showed there were significant differences among the various causes of accidents and accident cases (Minor, fatal and serious) with respect to types of vehicles involved over the years. Articles were sort from public libraries, as well as online through internet search engines and relevant information extracted. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts. Data on recorded cases of road traffic accidents was collected from the Motor Traffic Division (MTD), Divisional Headquarters, Jos, Plateau State Police Command. Out of 5921 accident cases, reckless driving, inexperience and mechanical fault and road defects accounted for 30.3, 21.5 and 21.1%, respectively. Two motorcycles, motorcycle-vehicle and vehicle-vehicle crashes are the lead types and have resulted in 38.9, 37.5 and 14.9% of the 855 deaths recorded within the period of study. Furthermore, the study showed that private cars, minibuses and taxis accounted for most of the accidents with 94.7% of the total accidents.
KEYWORDS
Road traffic accidents, Vehicle, Uncontrolled accidents, Plateau State, Traffic laws in Nigeria, Nigeria Police Force (NPF).

INTRODUCTION
Road traffic accidents occur when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole (Jacob, 2010). Worldwide, road traffic accidents lead to death and disability as well as financial cost to both society and the individual involved. There is generally increasing incidence, morbidity and mortality rates of road traffic accidents. Road traffic accidents injure people every day, more so in developing countries like Nigeria, Ovwori, Onibere and Asalor (2010). The enormity of the problem is not appreciated hence enough preventive measures are not taken. Road traffic accidents occur worldwide but the incidence is more in developing countries. Annually, it causes about 1.2 million deaths globally (WHO, 2004). Road traffic accident is a leading cause of death in adolescents and young adults worldwide. Majority of mortalities and morbidities occur in developing countries. In Nigeria, trauma is the main reason for emergency room visits and road traffic accidents are responsible for the majority of deaths. Road traffic injury rate is about 41 per 1000 population and mortality from road traffic injuries is about 1.6 per 1000 population. This is significant when the fact that majority of these injuries and deaths can be prevented. It becomes worrisome with the fact that the incidence is increasing. Road traffic accidents have several implications/cost. It has physical, social, emotional and economic implications. According to volume 2 of WHO’s 7th Report on World health Situations, global economic cost of road traffic accidents is estimated at $518 billion per year in 2003 with $100 billion of that occurring in poor developing countries. Nigeria loses about 80 Billion Naira annually to road accidents. According to Nantulya and Reich (2002), of all subjects that are involved in road traffic accidents in Nigeria, 29.1 per cent suffer disability and 13.5 per cent are unable to return to work. Hence, the cost of road traffic accidents includes the cost of private property and public amenities damaged, including the cost of medical treatment and the cost of productivity lost due to the accident.

STATEMENT OF THE PROBLEM
The rapid rate of uncontrolled and unplanned accidents in the state has brought with it complex urban health related problems. This implies a situation where health facilities become overcrowded and inadequate for the growing population. The distribution of health personnel and institutions are also inadequate. One of the most serious health problems facing Plateau town is the uncontrolled accidents on roads, which resulted from poor roads, over speeding and drunkenness. This is due to inadequate medical facilities and national development plan to care for the injured individuals leading to the spread of various infectious diseases within the metropolis.
It is against this backdrop that this research seeks to explore the road traffic accidents, national development and public health in contemporary Nigeria: analytical study of Plateau State - 2006-2013.

OBJECTIVE OF THE STUDY
This research will study the following:

1. Road traffic accidents in Nigeria using Plateau state as a case study
2. National Development; impact of national development and per capita income on road traffic accidents
3. Public Health; the inadequate and poor state of public health facilities and inadequate personnel as a key factor in fatality resulting from road traffic accidents

The study will analyse these objectives generally in Nigeria with detailed emphasis on Plateau State from 2006 to 2013. The study will also make sound recommendations that will create a balance between road accidents, national development and public health system.

RESEARCH PROPOSITION
Road accidents have threatened the public health system in Nigeria due to its attendant consequences.

SCOPE OF THE STUDY
1. The study will examines road traffic accidents, national development and public health in contemporary Nigeria and bring to the front burner for government and the public the need to urgently address the issues raised immediately.
2. Plateau State in north central Nigeria was used as a case study,
3. The researcher considered the period 2006 - 2013, since this period is reasonable enough to ascertain the variables under study.

HYPOTHESIS
H₀: Road accidents do not significantly affect public health system in Plateau State Nigeria.
H₁: Road accidents significantly affect public health system in Plateau State Nigeria.
H₂: The people residing in Plateau State do not have access to basic infrastructure due to current state of national development.
H₃: The people residing in Plateau State have access to basic infrastructure due to current state of national development.

REVIEW OF RELATED LITERATURE:

Literature was reviewed on thematic basis for clarity.

ROAD TRAFFIC ACCIDENTS

Anything that happens by chance is an accident. Accident is also anything occurring unexpectedly and un-designed, (Odugbemi, 2010). Road accident does not just happen; something causes it. Given the fact that Nigeria has the highest road accidents rate as well as the largest number of death per 10,000 vehicles (Sheriff, 2009), one may be tempted to believe that the level of awareness on the causes of road traffic accidents is very low among Nigerians. On the contrary, however, (Asalor, 2010) has shown that Nigerians know quite a lot about what could cause road traffic accidents and likened the situation to that in which in the midst of plenty, there could be hunger.

Road traffic accident is therefore an unexpected phenomenon that occurs through the use or operation of vehicles including bicycles and handcarts on the public highways and roads. Accidents may be fatal, resulting in deaths of the road users (passengers, drivers or pedestrians), or minor when it is not severe enough as to cause substantial hardship. The dividing line between minor and serious accident is however blurred. As has been defined, accident would rarely give warning although reckless drivers should anticipate the consequences of their recklessness. In general, accidents do not just occur; human recklessness, carelessness or negligence causes them. Even where the immediate cause of a road accident is attributable to mechanical factor, carelessness in the form of omission to check and maintain the vehicle at the appropriate time would have remotely contributed. Trivial checking and maintenance of the vehicles could avert an imminent accident.

In the ancient Plateau Empire, road transport owners / operators in the 11th century must provide a slave who will carry a red flag to warn other road users that a motor car is coming and leave the road space to avoid possible road accident (Jacobs, 2010). Today the car has a faster speed and the need to incorporate gadgets like, the horn, braking system, trafficators, headlights and break-lights to avoid road accident.

Before the ‘Oil boom’ in Nigeria, road accidents were rather rare. The oil boom brought along with its ‘rapid’ industrialization, which calls for improved accessibility. Hence, government responded by building roads without due attention to standard. As the disposable income of people grew vehicle ownership increased. According to (Sheriff, 2009), not all these
growth/developments took place with adequate measures and control. Consequently, the roads grew to become a death trap for Nigerian citizens. These are indirect factors of road accident in Nigeria.

**CAUSES OF ROAD TRAFFIC ACCIDENTS**

The issue of road traffic accidents is one that requires great care in handling, as it is hydra headed in nature. The major causes of road traffic accidents are:

a. Vehicle related factors
b. Human related factors
c. Environment-related factors

**VEHICLE RELATED ISSUES**

According to (Ovuwori et al., 2010), tyres, engines, braking system and lights system are among vehicle subsystems whose malfunction can cause road traffic accidents. The vehicle itself is a component of the road traffic system. Consequently, its reliability positively correlates with accident causation on the road network it plies. The reliability of the vehicle is itself a function of the condition of vehicle.

The following vehicular issues cause a good number of the accidents on Nigerian roads; I will attempt to discuss them:

**VEHICLE DESIGN**

Every Vehicle has its specified maximum load; this is maximum load is always indicated. It is therefore, not surprising that when subjected to stress over and above the provisions of the design specifications, accelerated wear and tear set in on the vehicles. The net effect of this could result in deterioration for the condition of the vehicle.

Defects in design affect the condition of the vehicle once it is on the road. If operated under normally conditions or otherwise, the defect may result in possible road accidents. Recall in Africa is not yet entrenched so any defect from manufacturer is born by the user(s) whether accidents results or not.
THE VEHICLE BODY

The body contribute to some measure in causing road traffic accidents; though less prominent is the firmness of the structure of the vehicle. Hanging parts of the body of a vehicle though rare can greatly affect the stability and hence the level of control by the operator.

THE BRAKE SYSTEM

The brake subsystem, working jointly with the accelerator is the main synchronizer of the speeds of vehicles. The brake sub-system malfunctioning should be taken very seriously as a potential source of unavoidable accident.

THE VEHICLE TYRES

The tyre is a dominant factor in determining the safety of automobiles on the road. Tyre related causes of road accidents could be due to one or a combination of:

- Tyre(s) (are) overinflated
- Thread are thoroughly worn-out
- Tyre(s) is (are) ‘pregnant’ and
- Tyre(s) is (are) rear peel-off

THE VEHICLE LIGHTS

Vehicle lights fall into two broad categories, namely those that are useful at all times (i.e. in daylight, in darkness and in poor weather) e.g. headlights. Although it is well known that the failure of vehicle light is a major factor in road traffic accident. As pointed out by Adiele (2011), light failure (e.g. of one headlight) has a tendency to misinform and mislead other road users thereby providing a good opportunity for an accident to occur. Similarly, a failed trafficator light will not normally provide the usual warning to the rest of the followers that the vehicle is about to undertake a turning manoeuvre, for instance. If the vehicle following has a faulty brake subsystem or its operator has not allowed for a sufficient safe-gap, this could result in an accident.

THE ENGINE

The engine sub-system is the head of the vehicle and should be as one whose sudden failure on a highway is more likely to cause an accident if the volume of traffic is sufficiently high. Even when the traffic is reasonably low, mis-management of the failure by an experienced operator could cause an accident.
HUMAN AND ENVIRONMENTAL / ROAD RELATED ISSUES

Some of the known factors that fall under this category include fog, sunrays, mist and rain. These in no small measure contribute greatly to the rate of road traffic accident in Nigeria today. The operator who is the master ‘on board’ should to be able to exercise sufficient control over the vehicle. A significant number of vehicular accidents are traceable to the road. Recent studies (Asolor et al, 2008) have demonstrated that the road is another major factor in road traffic accidents in Nigeria. (Akinyemi, 2009) collected and analysed ‘data on geometric design information system, roadway surface and road side conditions on seven two lane rural roads in the country. It found that rural roads in the country have low levels of design consistency, sight distance on and between geometric features as insufficient for stopping and overtaking adequate traffic control devices and unforgiving roadsides’. He then argues that their deficiencies are due largely to inadequate road design specification and maintenance. Anyata (2009) on the other hand showed that inadequate drainage could render the road a serious accident threat. Another aspect of the road factor is the general condition of the road itself. Issues of potholes, the indiscriminate location of police check points and the reluctance of the appropriate authorities to continue to improve on the condition of the roads are significant in road accidents.

DRIVER RELATED FACTORS

Studies have shown clearly that the single most important contributing factor to road traffic accidents in Nigeria is the attitude of the driver to driving code and etiquette. Driver related issues include sleepiness and fatigue, faulty preparation, ignorance of highway codes or traffic orders, driving under the influence of drugs and or alcohol and inexperience.

IS PLATEAU STATE PRONE TO ROAD ACCIDENTS?

Plateau State, one of Nigeria’s political and administrative capitals, has not sufficiently demonstrated that it is free of the incessant road accidents that characterize most highways across the country. Despite its first-class road networks and the heavy presence of state security agents like the Nigerian Police Force, the Road Safety Corps and the Vehicle Inspector officers, the capital city continues to experience numerous fatalities on its highways. In fact, road accidents are the number one cause of violent deaths in the Jos, Plateau state. Other prevailing causes of violent deaths in the capital city include crime, fire/explosion, natural disaster, other accidents, and sorcery, as documented in the Nigeria database. The following figures exhibit a noticeable trend in the causes of civil violence between the months of June and December 2013.
The above trend indicates that road accident was the main cause of violent death for the months of July, August, October, November and December. Road accident also ranks second for the month of June (after Other Accidents) and September (after Crime). A pattern of fatalities in the period under consideration is identifiable across the six municipalities that make up the Plateau State.

Ironically, the construction of the Plateau–Abuja expressway has been under construction for more than 10 years without any serious improvement. The rising death tolls on this road may not abate in the near future if the construction overseers fail to expedite completion of the expressway. Government and other stakeholders should therefore, take appropriate action to increase safety for road users. Even as simple as taking care of the bad spots that have become death traps for drivers that have little knowledge of the bad sections of the roads.

GOVERNORS’ CONVOYS AS METAPHORS OF EXECUTIVE HIGHWAY KILLERS
The cases of over-speeding governors’ convoys on our pothole-ridden roads continue to be a source of concern. Despite their constitutional role as the Chief Security Officers of their respective states, our governors and other VIPs blatantly disregard traffic rules, violating other road users’ rights and endangering lives. Since 2007, there have been many cases of irresponsible and deadly lawlessness perpetrated by convoys of state executives. The figure
below shows annual deaths resulting from accidents caused by governors’ convoy and frequency of such accidents from 2007 to 2013.

The blue columns represent the number of deaths, while the red indicate their frequency for each year. This analysis shows clearly that the cases of fatalities involving governors’ convoys are not recent happenings.

The public were incensed only with the recent killing of Prof Festus Iyayi, when the convoy of Kogi State Governor Mr Idris Wada rammed into the professor’s vehicle. Past trends ought to have provoked an outcry long before this. Convoys of at least 26 governors, including those of Plateau, Ekiti, Edo, Ogun, Katsina, Ondo, Delta, Imo, Nasarawa and Gombe, have been involved in fatal accidents since 2006. The following chart shows the trend by location, deaths and frequency since that year.

The emerging trend is that well over 75% of the states of the federation have had their share of the highway carnage characterizing the movement of state executives. The chief Security Officers of states constitute arguably a greater threat to the security of the lives of their citizens than other road users.

**NATIONAL DEVELOPMENT**

National, according to Longman dictionary of contemporary English, refers to a phenomenon that embraces a whole nation. The overall development or a collective socio-economic, political as well as religious advancement of a country or nation is termed national development. This is achievable through development planning, which describable as the country’s collection of strategies mapped out by the government.
NATIONAL DEVELOPMENT PLANS IN NIGERIA

We have had series of development plans in Nigeria. Its fifty-three years of independence actually are rolling by daily in search of development. The myth of growth and development is so entrenched that the country’s history passes for the history of development strategies and growth models from colonial times up to date. No term has been in constant flux as development. This seems the only country where virtually all notions and models of development have been experimented (Aremu, 2003).

Nigeria formulated, between 1962 and 1968, her first national development plan, just two years after independence, with the objectives of development opportunities in health, education and employment and improving access to these opportunities, etc. This plan failed because fifty percent of resources needed to finance the plan was to come from external sources, and only fourteen percent of the external finance was received (Ogwumike, 1995).

Collapse of the first Republic and the commencement of civil war also disrupted the plan. After the civil war in 1970, the second national development plan (1970 to 1974) were launched, the plan priorities were in agriculture, industry, transport, work force, defence, electricity, communication and water supply and provision of social services (Ogwumike, 1995). The third plan covering the period of (1975 to 1980) was more ambitious than the second plan. Rural development and efforts to revamp agricultural sector were the focus. The fourth plan (1981 to 1985) recognized the role of social services, health services. The plan aimed at bringing about improvement in the living conditions of the people. The specific objectives were an increase in the real income of the average citizen, more even distribution of income among individuals and socio-economic groups, increased dependence on the country’s material and human resources, a reduction in the level of unemployment and underemployment (Ogwumike, 1995).

During these periods, Nigeria did not invest her enormous oil wealth to build a viable industrial base for the country and for launching an agrarian revolution to liquidate mass poverty. For instance, the Green Revolution Programme that replaced Operation Feed the Nation failed to generate enough food for the masses. In the recent past, various strategies for development have also been tried with little or no result; among these were the structural adjustment programme (SAP), Vision 2010, national economic empowerment and development strategy (NEEDS), creation of development centres, etc. currently, seven point agenda of the present administration with vision 2020 without any clear methodological approach towards achieving them. It is obvious that the current results so far are not what development connotes.
THE PROBLEMS OF NATIONAL DEVELOPMENT IN NIGERIA

In spite of series of development strategies, put in place by successive governments, and sometimes with good intentions, all attempts to generate meaningful development proved futile. Based on this, the country has these puzzles: “Were those previous development plans or strategies bad in their context, or wrongly projected?” If nothing was wrong with the plans, then why is it still difficult to generate meaningful development in spite of the huge resources at our disposal? The solutions to these puzzles are not farfetched. Many factors have combined to fetter the nation’s development.

One, there are in most cases, no executive capacity responsible for the formulation and implementation of the plan. What we usually see are officials entrusted to such a position but without any meaningful executive authority.

Some of the previous development plans failed because; there was little or no consultation of the public. Planning is supposed to involve even the peasants in the villages. They even did not consult the local government officials who are close to the people. Planning is not an edifice where technocrats alone operate (Mimiko, 1998).

Lack of good governance also militates against national development. Where there is no good governance, development becomes a mirage. This is because of bad leadership in the country. Most of our leaders have no sense of commitment to development.

Mimiko (1998) captures the situation this way: “The decolonization allowed the crop of leaders that aligned with colonial power to take over Nigeria. This ensured the sustenance of a neo-colonial economy even after political independence. These leaders on assumption of power quickly turned up the repressive machinery of the colonial state rather than dismantling it. Significantly, they have no vision of development to accompany the efficient instrument of repression they inherited. All they were interested in was access to power and privileges and not development”.

High level of corruption and indiscipline is another barrier to development. Nigeria state is corrupt, managed by corrupt leaders who have made the state an instrument of capital accumulation, rather than using it to project the interest of the citizenry. A very good plan supervised by a thoroughly corrupt state can hardly do a thorough good job (Mimiko, 1998). Corruption and development are antithetical to each other, the two cannot cohabit, and so, where one is present, the other suffers.

Another important factor is the mono-economic base of the country. The country largely depends on crude oil for her survival to the detriment of other resources. They neglected all other sectors of the economy. For instance, government threw into limbo, over the years, agriculture, which constitutes the mainstay of the Nigerian economy in the 1950s and 1960s. How would government encourage export promotion when there is virtually nothing to export? The economy is undiversified and this is not suitable for a sustainable development (Mimiko, 1998).
MODELS OF DEVELOPMENT: ASIA IN CONTEXT

The enviable growth and development patterns of several Asian countries are well known. East Asia is the only region in the world that has been able to maintain strong, consistent growth patterns over several decades, led first by Japan and the newly industrializing economies of Hong Kong, South Korea, Singapore and Taiwan, etc (Mimiko, 1998; Adelman, 1995). Apart from the homogenous nature of these societies, several other factors were responsible for their development. These factors include development of agricultural sector, a system of mass education, development of indigenous industries, export-oriented strategy. Other factors are the discipline of their leadership, existence of efficient bureaucracy, human resources development, encouragement of a dynamic private sector working in co-operation with the government towards a society-wide vision of development, institutional capacity building and attention to the problems of governance, consistency and policy stability (Mimiko, 1998).

STRATEGIES FOR NATIONAL DEVELOPMENT

The beauty of any development plan is the faithful implementation of such plan, which its success lies with the implementers. In our previous discussion, it is on record that most of the past development plans failed due to implementation problems and lack of committed leadership. Based on this fact, new development policies and strategies are currently in place as alternative strategies for development, such as Seven Points Agenda, Vision 2020. These policies and vision appear to be all-embracing but they are not sacrosanct in their totality. However, if faithfully implemented, the nation at least will move towards the path of development. It is in our opinion that for successful implementation of the Seven Point Agenda of the present regime in Plateau state, there are some lessons they can learn from Asian models of development.

First, development requires total commitment on the parts of the leadership. The need for discipline and honesty on the part of the project implementers cannot be over emphasised; such officials should show enough discipline, interest, willingness, dedication and honesty. Without these attributes and the will to pursue set economic goals, all other ingredients of development present would amount to nullity.

Second, this country should learn that wholesale liberalization; the type advocated by the apologists of orthodox SAP is not necessarily synonymous with development. It goes without saying therefore that a level of state involvement (heterodoxy) is imperative even in the face of the crucial need for structural adjustment. Nevertheless, whatever the degree of state involvement, there must be a guarantee for private ownership of properties for investment to get stimulated (Mimiko, 1997). It is another question whether the Nigerian state as presently constituted can play this critical role given its embarrassing level of corruption, inefficiency and incapacitation by commitment to sundry primordial values. Be it as it may, the goal should be to evolve a process of reformation of the state to make it able to play the type of highly constructive role that its counterparts are playing in the whole of East Asia (Mimiko, 1997).
In addition, stability and continuity of policies encourage investment and propel development. For instance, in Korea, the assassination of Park did not change the policies he put in place; they remained. Nigeria leadership must learn to build on policies rather than to jettison them for new ones for the sake of party politics and personal aggrandizement.

There is the need for Nigeria to revamp the agricultural sector; this sector was instrumental in the development of Japan. Agriculture used to be the mainstay of Nigeria economy but the discovery of crude oil succeeded in putting agriculture into state of standstill or oblivion.

Human resources development is also a sine qua non to Nigeria national development; Japan and Korea demonstrated this (Lawal et al., 1976). Development depends very much on human knowledge and skills. Hence, achievement of high quality education and training for a large majority of the populace at a reasonable price and the context that is relevant and adequate to the country’s development needs is a necessity. It is the people that develop, affirms development literatures, and that unless there are large numbers of suitably qualified people, development cannot take place.

There is need for attitudinal change. Nigerians must actually change their pessimistic attitude towards development. The idea or belief that “things cannot work in Nigeria or Nigerian factor” should be discouraged. Real development is achievable through internal activities rather than from external influences. Development is as a process generated within a society by forces propagated and invigorated by the actual members of that society. Outsider cannot start and sustain true development. Although, no country can develop in isolation, but emphasis should not be on foreign resources for the country’s development. The models of development of Japan and China show how these countries utilize their internal resources both human and material for rapid economic development. It is reasonable that Nigerians should inculcate a high sense of patriotism as demonstrated by the Japanese and Chinese.

It is important to promote citizenship over indigeneity in order to achieve cooperation and participation of all communities in the development process. Omotoso (2008) noted that the 1999 constitution directly or indirect promotes indigeneity in the country. For example, section 318(1) of paragraph (IV) supports indigeneity. The constitution sets parameters for indigenes and non-indigenes. It equally gives legal bases to various discriminatory policies that actively promote indigeneity, contrary to some sections that argue against discrimination. This is contradictory. Leadership in Nigeria must behave in a way to inculcate the spirit of patriotism in the minds of the people, so that they will be ready to stand with the government in her development efforts. When Nigerians see themselves as one and not as belonging to one ethnic nationality or the other as portrayed presently, the urge to develop Nigeria will be cultivated.

Additionally, the need to reform electoral process is imperative for socio-economic and political development. Electoral fraud is one of the banes of Nigeria’s development. The role of leadership in development cannot be overemphasized; all efforts towards development must be well coordinated and directed by the leaders. Therefore, the leaders must be development conscious, have genuine interest for development and the political will to propel such
developmental agenda. The leaders must also seek the cooperation of the people, because, it is the people that develop a nation. Honestly, the aforementioned ingredients are not possible without a legitimized mandate for the leaders by the people. When a leader assumes office illegitimately or through electoral fraud, such leader is bound to fail in his effort to generate meaningful development. This is because illegitimate leaders tend to display characters that repress development such as; selfishness, corruption, pride, thuggery and inefficiency. There will also be apathy and natural detachment from development plans by the people, as they did not see such emerging leaders as the products of their consent through voting. Based on the foregoing, there is need to reform the electoral process in such a way that nobody assumes power (political) through crook or fraudulent means. Opened, free, fair and competitive the process should be. Swearing in must wait until all legal battles after the elections are concluded. This will create genuine environment conducive for development.

Lastly, development plans should be a holistic and an all-encompassing national issue that cuts across economic, social, political and psychological aspects of the citizens and the country, and not just exclusively an economic issue.

PUBLIC HEALTH

The dimensions of health can encompass “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”. As defined by the United Nations’ World Health Organization, Public health incorporates the interdisciplinary approaches of epidemiology, biostatistics and health services. Environmental health, community health, behavioural health, and occupational health are other important subfields (WHO, 2005). Just as studies of the impact health on urbanization reveal that urbanization can have both positive and negative effects on health. Urban life can be rich and fulfilling since it is more diverse, stimulating, and full of new opportunities. Individual and family mobility make it easier to escape from oppressive social relationships. Cities are sources of ideas, energy, creativity, and technology. They can, foster enlightened, congenial, and multicultural living (McMicheal 2000).

Health Reform Foundation of Nigeria (2012) affirmed that, urbanization is a public health issue. There is the need to have urban planning, decongest the urban areas by ensuring peripheries are provided essential amenities such as good roads network water, electricity, health facilities and good schools. In addition, tackling environmental sanitation issues need be in the front burner, while facilities for recreation and walkways should be provided on roads for health-walk “he stated. Iyun (2009), also affirmed that the “health status of urban people is expected to be worse in comparison with those in the rural areas considering their various health challenges such as poor sanitary conditions, lack of potable water and high pollution level.

Abiodun (2010) explain the need for Nigeria to explore and strengthen other mechanisms of health system and shift focus from out-of-pocket payments, address the issues that have undermined public health care financing in Nigeria, improve on evidence-based planning, and prompt implementation of the National Health Bill when signed into law. Onwujeckwe et al (2010) explain that, In spite of the various reforms to increase the provision of health care
services to the Nigerian people, health access is only 43.3%. The inadequacy of the health care delivery system in Nigeria is attributable to the peculiar demographics of the Nigerian populace. About 55% of the population lives in the rural areas and only 45% live in the urban areas. Moe et al (2007) opined that, Provision of timely information aimed at combating possible health menace among many other things is an important function of public health. Hence, inadequate tracking techniques in the public health sector can lead to huge health insecurity, and hence endanger national security.

Ekudayomi and Adekpoju (2008) in their study, “Public Health and Population Growth” revealed that available health facilities/infrastructure in the cities become over stretched as urban population continue to rise. They further explained that, failure of the Nigerian government to respond adequately to the increasing demand for urban Health infrastructural services has had the following consequences like, deteriorated quality of life in the city, the inadequate provision of infrastructural services, shortage of drug, and decline in the productivity of workers. In the same way, Harris (2003) advised that in other to avert the consequence of uncontrolled urbanization on public health, government across the world must, make it a priority, devise ways to plan their cities, improve urban living conditions, like water and sanitation, housing, transportation, promoting health behavior and safety condition.

THEORETICAL LITERATURE

CAUSES OF ROAD ACCIDENTS

The causes of road traffic accidents are multi-factorial. These factors are divisible into driver factors, vehicle factors and roadway factors. Accidents causative factors are a combination of these factors. Driver factors solely contributes to about 57 per cent of road traffic accidents and 93% either alone or in combination with other factors Driver factors in road traffic accidents are all factors related to drivers and other road users. This may include driver behaviour, visual and auditory acuity, decision-making ability and reaction speed. Drug and alcohol use while driving is an obvious predictor of road traffic accident, road traffic injury and death. Speeding, travelling too fast for prevailing conditions or above the speed limit, is also a driver factor that contributes to road traffic accidents. The risk of being injured increases exponentially with speed much faster than the average speed. The severity of injury depends on the vehicle speed change at impact and transfer of kinetic energy. Though vehicles travelling slower than average speed are also at increased risk of road traffic accidents, most involve speed too fast for the conditions.

Vehicular factors are divisible into vehicle design and vehicle maintenance. Some safety features of vehicles like seatbelts and airbags are likely to reduce the risk of death and serious injuries. A well-designed and maintained vehicle is less likely to be involved in accidents. If the brakes and tires are good and the suspension well adjusted, the vehicle is more controllable in an emergency and thus, better equipped to avoid accidents. Road design and maintenance is also a factor that contributes to road traffic accidents. The causes of road traffic accidents are not just human error
or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world.

EMPIRICAL LITERATURE

ROAD ACCIDENT PREVENTIVE MEASURES
This section discusses the major issues of preventing or measures generally taken to prevent road traffic accidents.

TRAINING AND RETRAINING
The training and retraining of drivers constitute a formidable means of effectively dealing with the issue of reduction of road traffic accident. The road traffic system itself is dynamic in nature. Therefore, the training and retraining of operators of vehicles is a necessity. This measure is the only means of ensuring that operators entering or remaining in action in the system have the necessary skills.

ENGINEERING
This is one of the four strategies popularly known by road safety practitioners and scholars as the ‘FOUR E’s’. According to Sanders (2010), engineering will normally focus on those elements that deal with safer vehicles and improved vehicle design. The real point here is that engineering as a counter measure is that it ensures that a high reliability is achieved at the design stage and consequently the occurrence of failure of the vehicle while in operation is maintained.

EDUCATION
Education is another means of effectively reducing road traffic accidents. Nigerians are well aware of the factors that could cause road traffic accidents. Education can prepare the ground for more long-term attitude and behaviour changes and therefore, that road safety education should start with pre-school age groups and continue through a child’s formal education.

ENFORCEMENT
Traffic laws are for the protection of all road network users. In order for the laws to have the desired effects, enforcement by the various laws, enforcement agencies must be fair and just.
Experience has shown that in countries where enforcement is adequate, road traffic accidents have declined.

EVALUATION

Evaluation is a proven means of providing a basis for remedial actions. Consequently, this serves as another effective means of knowing when and what kind of further actions are required in order to achieve a visible reduction in accident tallies.

INVESTIGATION

The proper investigation of accidents is yet another rather effective means, though remote, of achieving some reduction in accident. The hypothesis here is that a driver who is aware that the extent of his fault in an accident is identifiable by a thorough investigation is more likely to be careful.

MAINTENANCE

Maintenance in all its ramifications is one of the most effective preventive measures that any individual or organization can take to maximize the output of his, its accident reduction/prevention programme. Any maintenance programme expected to make a meaningful and sufficient impact must of necessity, address three major aspects namely, the road network, the vehicle and the driver.

BUDGETING ISSUES

Budgeting is a major nuisance factors as it is not within the control of the average road user. Any maintenance programmes without an adequate budget is as good as the ‘do nothing’ solution option of the system approach. Therefore, a remote way of ensuring accident reduction/prevention is for government, charged with the responsibility for good maintenance, to draw up and implement to the letter on regular basis, budgets that match the demands of the road network and its infrastructure.

THE OPERATOR/DRIVER

The driver himself is subject to physiological wear and tear. As the driver is the main actor in controlling the factors responsible for accidents, it is imperative that he be both physically and mentally alert when operating the vehicle. Consequently, the driver requires adequate
maintenance, which may come in the form of welfare scheme, health service programme, retraining.

**METHODOLOGY**

This study used survey research method. This is because of its exploratory nature. The researchers also employed both primary and secondary sources of data collection. We used questionnaires in collecting primary data while secondary data came from related literatures, textbooks, journals, bulletins and periodicals.

**MATERIALS AND METHODS**

The study used data obtained from the Motor Traffic Division (MTD) and Nigeria Police Force (NPF) that comprises of Plateau Police Division (PPD). The Director General of Traffic (DGT) of PPD is the sole authority to record, analyze and publish all data related to traffic accidents in Plateau State. Road traffic accident (RTA) reports of the Federal Road Safety Corp (FRSC) and related data from PPD is thought to be of high coverage, because of enforcement of a law that car insurance companies, garages or repair establishments could not accept a vehicle involved in an accident for insurance claim and repair if a police report is not produced. Similar traffic laws exist in other different Nigerian States (El-Sadig *et al.*, 2002, Ziyad and Akhtar, 2011). Nevertheless, the true number of RTA and related fatality and injury are likely to be higher in Plateau than it is reported by PPD, as it omit the accident cases that results in minor damage, injury or causality and overlook minor self accidents or the accidents cases that are settled by the parties mutually at the scene. The definition of RTA includes all traffic related accidents that result in injury or death to road users. RTA injuries are defined as all traffic related non-fatal injuries, while RTA fatalities are defined to include all traffic-related deaths that occur within 30 days from the accident. Population denominator data were obtained from the published population census reports and the inter census population estimates were obtained based on the enumerated population of 1993, 2003 and 2010 population census in Nigeria. We obtained the data for global comparison from the WHO Reports (2009).

**VALIDITY OF INSTRUMENT**

To validate the research instrument, the researchers employed the services of two Road Safety officers, two employees and two employers of Federal Medical Center from Plateau, Nigeria for validity. The questionnaire was validated after thorough scrutiny and valuable contributions made duly incorporation.
RELIABILITY OF THE INSTRUMENT

To estimate the reliability of the instrument employed for data collection, the instrument was administered twice to town planning officers, medical doctors, environmental officers, employees and employers of labours numbering twenty from Plateau. The second administration of the instrument was two weeks after the first exercise and the resulting scores were correlated using Pearson Product Moment Correlation approach. This yielded the co-efficient Pf r = 0.82. This score indicates that the instrument is very reliable.

STUDY INSTRUMENT

We conducted the study in Plateau State, Nigeria. Selection of sample respondents located in residential (households) and institutional (Health) facilities were drawn for the study using cluster sampling. Questionnaires and in-depth interview were conducted to retrieve information from the households in the cluster and respondents in selected Health institutions were interviewed. We administered 399 questionnaires, out of this, 367 was analysed giving a response rate of 92%. For more in-depth understanding of the social reality of population growth and its impact on the health system in Plateau metropolis, 15 in-depth interviews (IDIs) were conducted among the Management and staff of some selected health institutions, environmental officers, town planning officers, employers and employees of labors using simple random sampling. The questionnaire was title “Effect of Urbanization on public health system (EUPHS).” The questionnaire has two sections. Section “A” demands information on the effect of urbanization on the public system and section “B” contains the likely measures to addressing such negative effects. The instrument is in the form of like five point rating scale. The response options have the values of 5, 4, 3, 2, and 1, respectively.

STUDY AREA AND POPULATION

The study focused on people living and working in Plateau State. The present Plateau state is in Nigeria’s middle belt and shares boundaries with Nassarawa, Kaduna and Bauchi. Created in 1976, it has an area of 26,899 square kilometers. The state has an estimated population of about three million people. It is located between latitude 80°23’N and longitude 80°32’N and 100°38’E. Plateau was one of the first British settlements in the northern part of Nigeria, and it rapidly developed in the 1970s as a result of the European economic activities and later, political activities, especially at the turn of the century. The town started as a cosmopolitan settlement that attracted people from various parts of what is now Nigeria, Sierra Leone, and Europe (Mohammed, 1984). The significance of the town is not only due to its geographical location as the confluence of Rivers Niger and Benue, but also to the historical fact that it was the first
colonial administration capital of Northern Nigeria with rich tourist attractions. Today, Plateau with a Capital city of Jos has a population of about 3,378,093 according to the 2006 national census with an annual growth rate of 2.6%. Plateau state comprises seventeen Local Government Areas (LGAs) in three Senatorial Districts. The major occupations of people are mining, farming, fishing and trading.

LIMITATIONS OF THE STUDY

On primary data, despite the efforts to build in checks and balances in the areas of questionnaire validity and reliability, spread of respondents, and effective coverage of the geographical area of study, we still advice that the following should be taken with caution:

(i) The use of field assistant could have introduced different levels of interviewer bias.
(ii) The problems of using a sample to represent a population should not be discounted
(iii) Respondents’ bias may also have interfered with the data generated and subsequently the findings of the study

For our secondary data, we relied on documents and data from government agencies not reputed to be the best in record gathering and storage. Therefore, the limitation of our study will come from the reliability and accuracy of the data and hence information from these sources.

PRESENTATION AND ANALYSIS OF RESULTS

RESULTS

LEVELS AND TRENDS OF AUTOMOBILES USAGE IN PLATEAU

Table 1 shows the growth of population and automobiles in Plateau State during the 7-year study period 2006 - 2013. It is observable that there has been massive increase in the number of automobiles compared to population increase during the period 2006 to 2013. Between 2006 and 2013, the population of Plateau increased by 21.6%, with the mean annual increase by about 2.0%. On the other hand, the automobile fleet in the country increased by 52.4%, with a mean annual increase by 4.3% between 2006 and 2013. At the same period, the new registration of automobile increased by 161%, with a mean annual increase by 10%. The most remarkable increase in new registration of automobiles occurred during 2006 - 2013 period. During this period, the number of new registration jumped to five-digit number. For example, the number of vehicles in 2006 was 548,908, and 80,762 vehicles were added during 2007, taking the total at
the end of the year to 629,670. After 2008, new registration shows gradual decrease. On average, more than 85,000 new vehicles were registered annually in Plateau between the years 2006 and 2013 (Table 1).

Table 1 Growth of population and vehicle in Plateau state: 2006 – 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Population in '000</th>
<th>No. of registered vehicles</th>
<th>No. of new registered vehicles</th>
<th>Annual growth rate in registered vehicles (%)</th>
<th>Annual growth rate in new registered vehicles (%)</th>
<th>No. of vehicle per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2233</td>
<td>495914</td>
<td>48740</td>
<td></td>
<td></td>
<td>244</td>
</tr>
<tr>
<td>2007</td>
<td>2268</td>
<td>520926</td>
<td>42978</td>
<td>5.04</td>
<td>-11.82</td>
<td>249</td>
</tr>
<tr>
<td>2008</td>
<td>2304</td>
<td>560302</td>
<td>39376</td>
<td>7.56</td>
<td>-8.38</td>
<td>260</td>
</tr>
<tr>
<td>2009</td>
<td>2341</td>
<td>444500</td>
<td>42561</td>
<td>-20.67</td>
<td>8.09</td>
<td>208</td>
</tr>
<tr>
<td>2010</td>
<td>2399</td>
<td>468412</td>
<td>57130</td>
<td>5.38</td>
<td>34.23</td>
<td>219</td>
</tr>
<tr>
<td>2011</td>
<td>2459</td>
<td>500385</td>
<td>73421</td>
<td>6.83</td>
<td>28.52</td>
<td>233</td>
</tr>
<tr>
<td>2012</td>
<td>2521</td>
<td>548908</td>
<td>104891</td>
<td>9.70</td>
<td>42.86</td>
<td>259</td>
</tr>
<tr>
<td>2013</td>
<td>2584</td>
<td>629670</td>
<td>136516</td>
<td>14.71</td>
<td>30.15</td>
<td>297</td>
</tr>
<tr>
<td>% change 2006 – 2013</td>
<td>15.72</td>
<td>26.97</td>
<td>180.09</td>
<td></td>
<td></td>
<td>21.72</td>
</tr>
<tr>
<td>Average for the period 2006 - 2013</td>
<td>2354</td>
<td>521,127</td>
<td>68,202</td>
<td>4.08</td>
<td>17.66</td>
<td>246</td>
</tr>
</tbody>
</table>

Source: Global status report on road safety (WHO, 2013)

Motorization level, as measured by the number of vehicle per 1000 population, shows that on average there are 246 vehicles per 1000 population in Plateau. The 2010 population census in Plateau recorded 551,058 households in Plateau State. Thus, there are approximately 0.45 vehicles per household in Plateau State.

Over all, motorization shows increasing trends in Plateau. Between 2006 and 2013, motorization level increased by 27%.
Figure 1 presents a comparative picture of the level of motorization (number of vehicle per 1000 population) in some selected high and middle-income cities in Plateau in 2013. The information were obtained from the 2013 WHO’s global status report on road safety (WHO, 2013).

Figure 3: Level of motorization (number of vehicle per 1000 population) in some selected high and middle-income cities in Plateau state in 2013

With the absence of a railway network or waterways in Plateau, roads remain the primary means for transporting goods and people within the country. There is no public or private bus service within the city or suburban area. However, there are limited intercity bus services, run by a single agency called “Plateau National Transport Company” (PNTC). Shared private taxi services are also available within the city and town areas. Thus, private car and Taxi service are the major modes of personal transport in Plateau. As a result, the most of the registered vehicle in Plateau are private car which numbers have increased tremendously in recent time.

Figure 4 shows the percentage distribution of registered vehicles by types of registration in 2013. The data indicate that private car represents the major share of the registered vehicles, as 70% of the registered vehicles are private cars, followed by commercially used vehicles (21%), Taxi (4%), government use (2%), rental (1.3%) and others (each 1.7%). The ratio of number of private cars and the number of households indicates that there is almost one private car per household in Plateau State (0.96:1).
Figure 4: Percentage distribution of registered vehicles by types of registration

Source: FRSC, 2013

Figure 4 shows the trends in the number of registered vehicles by types of license for the 7-year period starting from 2006 to 2013. During this period, the number of registered vehicles increased, on the average, by 4.3% per annum. This increase is mainly due to increase in private cars and commercially used cars. Private cars are increasing annually, on the average, by 7%, while commercially used cars are increasing by 2.7% per annum. On the other hand, the number of Taxi, government owns vehicles and other types of vehicles remain almost same over the period. The possession of private cars shows steady increase over the period. The growth rate was highest during 2007 - 2008 (15%). The rate of possession of private car per 1000 population increased from 126 in 2006 to 195 in 2013. Globally, Plateau’s rank is 52 in terms of car possession per 1000 population, with highest in Nigeria (765 cars 1000 population) (WHO, 2013).

Levels and Trends in Road Traffic Accidents (RTAs) in Plateau

According to the 2000 National Health Survey in Plateau (Al Riyami et al., 2000), conducted by the Ministry of Health, road traffic work is the number one cause of accident and injury in Plateau State accounting for 61 % of the total accident (Table 2). Other important causes of accident are accidental fall (22 %), burns (4.8%), bullet accident (1.8%) and food poisoning
Males are 1.5 times more likely to experience injuries than females, while the rate of accidental fall, burns, and food poisoning are higher among females.

Table 2: Percent distribution of accident and injury by causes according to sex, Plateau 2013

<table>
<thead>
<tr>
<th>Cause of accident/injury</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road traffic accident (RTA)</td>
<td>68.1</td>
<td>42.6</td>
<td>60.8</td>
</tr>
<tr>
<td>Accidental fall</td>
<td>16.8</td>
<td>36.2</td>
<td>22.3</td>
</tr>
<tr>
<td>Burns</td>
<td>3.4</td>
<td>8.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Food poisoning</td>
<td>0.8</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Sharp and mechanical tools</td>
<td>0.8</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Fire bullets accident</td>
<td>2.5</td>
<td>-</td>
<td>1.8</td>
</tr>
<tr>
<td>Electrical shocks</td>
<td>0.8</td>
<td>-</td>
<td>0.6</td>
</tr>
<tr>
<td>Swallowing chemical/drug</td>
<td>0.8</td>
<td>-</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>5.9</td>
<td>8.5</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Plateau National Health Survey, 2000

Data in Table 3 shows the levels and trends of RTA in Plateau during the first decade of the new millennium (2000-2009), according to the PPD data source. In absolute term there were 7,253 traffic accidents in 2009 against 2.7 million population and 755,937 registered vehicles, indicating a rate of 2.67 accident per 1000 population or 9.59 accident per 1000 registered vehicles.
Table 3: Level of RTA per 1000 population and vehicles, 2006-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of RTA</th>
<th>RTA per 1000 population</th>
<th>RTA per 1000 vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>13040</td>
<td>5.84</td>
<td>26.29</td>
</tr>
<tr>
<td>2005</td>
<td>13101</td>
<td>5.78</td>
<td>25.15</td>
</tr>
<tr>
<td>2006</td>
<td>9107</td>
<td>3.95</td>
<td>16.25</td>
</tr>
<tr>
<td>2007</td>
<td>10197</td>
<td>4.36</td>
<td>22.94</td>
</tr>
<tr>
<td>2008</td>
<td>9460</td>
<td>3.94</td>
<td>20.20</td>
</tr>
<tr>
<td>2009</td>
<td>9247</td>
<td>3.76</td>
<td>18.48</td>
</tr>
<tr>
<td>2010</td>
<td>9869</td>
<td>3.92</td>
<td>17.98</td>
</tr>
<tr>
<td>2011</td>
<td>8816</td>
<td>3.41</td>
<td>14.00</td>
</tr>
<tr>
<td>2012</td>
<td>7982</td>
<td>3.01</td>
<td>11.08</td>
</tr>
<tr>
<td>2013</td>
<td>7253</td>
<td>2.67</td>
<td>9.59</td>
</tr>
</tbody>
</table>

% change during 2006 - 2013 = -44.38

Average growth per annum = -5.7%

As we may have seen from Table 3 and Figure 4 that there is an appreciable decline in RTA rates in Plateau. The number of accidents fell down from 13,040 cases in 2006 to 7,253 in 2013, a dPP of 44% over the period 2006-2013 or a decline of 5.7% per annum. During the same period, the overall decrease in accident rate was 54% for per 1000 population and 63.5% for per 1000 vehicles. The corresponding figures for average annual decreases are 7.5% and 9.6%, respectively. This fall in accident has occurred despite the fact that the number of vehicles on the roads and new driving licenses as well as the population increased over the period. This may be a consequence of the traffic safety efforts of PP by imposing stringent conditions for issuing license and road safety information, education and communication (IEC) programmes through mass media.

**TYPES OF RTAS IN PLATEAU**

Figure 4 shows the distribution of RTA in Plateau in 2013 by the types and severity. The types of RTA were categorized as collusion with other vehicles, collusion with fixed objects, overturn and run over pedestrians. It can be seen that about 70% of the accidents are due to collision: 48% with other vehicles and 22% with fixed objects. Sixteen percent of the accidents were due to overturn and 14% were due to run over the pedestrians. The distribution of RTA by the type of severity indicate that nearly two third (64%) of the RTA caused injury, while 10.5% caused fatality and the rest 26% were with minor or no causality (Table 4).
SOCIO-DEMOGRAPHIC PROFILE OF THE VICTIMS

Total of 1238 accident cases were included in the study. Majority of the victims (984 cases) were in the younger age group of 15-50 years (79.47%). Four hundred and thirty three (433) cases (34.97%) was seen in the age group of 25-39 years. Children less than 14 yrs and elderly (>60yrs of age) made up 176 cases (14.21%). One thousand and ninety nine (88.77%) of the victims were males with 139 (11.23%) of them were females.

Majority of the victims were Christians 998 (80.62%) with Muslims and Pagans forming 18.98% and 0.40% respectively. Of the 1238 victims interviewed 925 (74.72%) were married accounting for 74.72% of the victims, while 313 (25.28%) were not married (for analysis purpose even victims less than marriageable age were included in the not married group).

Majority of the victims had had a primary level of education 31.02%, while 20.27% of the victims were illiterates. Only 14.46% of the victims had a degree only one victim had a professional degree, while 27.95% of the victims had a secondary education. Twenty two point six two per cent (22.62%) of the victims were unskilled labourers like manual labourers and farmers and 25.53% of the victims were semi skilled, which included drivers (taxi, auto, maxi cab). All the female victims were homemakers, accounting for 6.70% of the injuries.
PATTERN OF INJURIES

Out of the total 1238 (100%) RTA cases, 118 (9.53%) had injuries of upper limb, 297 (23.99%) had injury of lower limb, 495 (39.98%) had injury on the abdomen and 328 (26.49%) had multiple injuries at more than one site. (Table 5)

Table 5: Pattern of injuries

<table>
<thead>
<tr>
<th>Part involved in RTI</th>
<th>Number of victims(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper limb</td>
<td>118 (9.53)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>297 (23.99)</td>
</tr>
<tr>
<td>Abdominal</td>
<td>495 (39.98)</td>
</tr>
<tr>
<td>Multiple</td>
<td>328 (26.49)</td>
</tr>
<tr>
<td>Total(%)</td>
<td>1238 (100)</td>
</tr>
</tbody>
</table>

Severity of RTI/TIS

<table>
<thead>
<tr>
<th>Severity of RTI/TIS</th>
<th>Number of victims(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>688 (55.58)</td>
</tr>
<tr>
<td>Moderate</td>
<td>389 (31.42)</td>
</tr>
<tr>
<td>Severe</td>
<td>161 (13)</td>
</tr>
<tr>
<td>Total (%)</td>
<td>1238 (100)</td>
</tr>
</tbody>
</table>

VULNERABLE ROAD USERS

<table>
<thead>
<tr>
<th>Vulnerable Road Users</th>
<th>Number of victims(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian</td>
<td>166 (13.41)</td>
</tr>
<tr>
<td>Cyclist</td>
<td>112 (9.05)</td>
</tr>
<tr>
<td>Motorized two-wheeler</td>
<td>514 (41.51)</td>
</tr>
<tr>
<td>3 wheeler</td>
<td>112 (9.05)</td>
</tr>
</tbody>
</table>
SEVERITY OF INJURIES

The severity of injuries suffered by the victims was graded according to the “Trauma Index”\textsuperscript{4}. According to this index injuries are classified as mild injuries (0-7), moderate (8-18) and severe injuries (more than 18). So in this study it was observed that 688 (55.58\%) had a score of 0-7 and categorized under minor injuries, 389 (31.42\%) had a score of 8-18 and categorized under moderate injuries and 161 (13\%) had > 18 injuries and put under the category of severe injuries. (Table-5)

AILMENT AT THE TIME OF INJURY

Among the victims 223 (18.01\%) of them gave a history of having consumed alcohol within 6 hours before the RTI, whereas 1015 (81.99\%) of them had not consumed. children were grouped under ‘NO’ for simplification, however, no information was collected as to the type or quantity of alcohol consumed.

Type of vehicle involved Majority of the victims were two wheeler occupants (riders or pillions) and occupants of Light Motor vehicles 41.51\% and 19.39\% respectively. Pedestrians became victims in 13.41\% of cases. Cyclists and occupants of 3 wheelers made up 9.05\% each. (Table-5)

DAYS OF OCCURRENCE OF INJURY:

In the present study, 670 (54.12\%) accident cases were reported on weekdays i.e. Monday-Fridays and remaining 568 (45.88\%) on weekends i.e. Saturdays and Sundays.

Time of occurrence of injury: Four hundred and ninety seven (40.15\%) of the RTIs took place between 6pm - 12midnight, followed by 357 (28.84\%) between 6am-12 noon. 114 cases with least RTIs occurred between12.01am – 6 am (9.21\%). (Table-6)
### Table 6: Antecedent Factors

<table>
<thead>
<tr>
<th>Time of Injury</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning(6am-12 noon)</td>
<td>357 (28.84%)</td>
</tr>
<tr>
<td>Afternoon(12.1pm -6pm)</td>
<td>270 (21.80%)</td>
</tr>
<tr>
<td>Evening(6.1pm-12midnight)</td>
<td>497 (40.15%)</td>
</tr>
<tr>
<td>Night(12.1am -6 am)</td>
<td>114 (9.21%)</td>
</tr>
<tr>
<td>Total</td>
<td>1238 (100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What hit you?</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>32 (2.58%)</td>
</tr>
<tr>
<td>Cycle</td>
<td>20 (1.62%)</td>
</tr>
<tr>
<td>Motorized two-wheeler</td>
<td>260 (21.0%)</td>
</tr>
<tr>
<td>Three wheeler</td>
<td>130 (10.50%)</td>
</tr>
<tr>
<td>LMV ( car, jeep, van)</td>
<td>322 (26.01%)</td>
</tr>
<tr>
<td>HMV(bus/truck)</td>
<td>160 (12.92%)</td>
</tr>
<tr>
<td>Tractor</td>
<td>44 (3.55%)</td>
</tr>
<tr>
<td>Other vehicle</td>
<td>25 (2.02%)</td>
</tr>
<tr>
<td>Self fall</td>
<td>89 (7.19%)</td>
</tr>
<tr>
<td>Animal</td>
<td>36 (2.91%)</td>
</tr>
<tr>
<td>Trees</td>
<td>111 (8.97%)</td>
</tr>
<tr>
<td>Electric pole</td>
<td>09 (0.73%)</td>
</tr>
<tr>
<td>Total</td>
<td>1238 (100%)</td>
</tr>
<tr>
<td>Type of collision</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Head on</td>
<td>204 (16.48)</td>
</tr>
<tr>
<td>Sideways</td>
<td>650 (52.50)</td>
</tr>
<tr>
<td>From behind</td>
<td>173 (13.98)</td>
</tr>
<tr>
<td>NA</td>
<td>211 (17.04)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

*Place of injury*

48% of the RTIs occurred outside the city, whereas 32% of the injuries occurred inside the city. 20% of the RTIs took place on the outskirts of Ambala.

*Where injury occurred?*

Majority of the RTIs took place on main roads 73.8%, followed by near junctions, 14.2% and cross roads 12.0%.

*What hit you?*

The vehicles involved in injuring the victims were LMVs most of the times 322 (26.01%) followed by motorized two wheelers 21.0% of the times. HMV hit the victims in 12.92% of the cases. 18 (7.19%) victims said that they sustained injury by self-fall, followed by tractor hitting the victim in 3.55% of the time.

*Type of collision* Majority of the times it was a sideways collision; 52.50% of the times, followed by head on collision; 16.48% of the times. Only in 13.98% of the times, the victims were hit from behind. (Table-6).

*Local environmental condition of the place of injury*

Majority of the victims; 1045 (84.41%) responded that the road on which the RTI took place was tarred, while 149 (12.04%) of the victims responded that the road was rough and 48 (3.88%) of them responded that the road was wet at the time of injury. Eight hundred and twenty two (66.2%) of the victims said that the lighting was adequate at the time of occurrence RTI (Injuries
that took place during day time were included under ‘adequate’ lighting for analysis). Three hundred and forty (27.46%) of the victims said that there was no lighting at the site of injury occurrence and 77 (6.22%) of them said that the lighting was inadequate.

**Medical aid at the site of injury**

Only 4.12% of the victims mentioned that there was medical aid available at the site of injury (within 500 meters from the site of injury).

**How injury occurred?**

Majority of the victims were injured while there crossing a road 875 (70.68%), 231 (18.66%) of them were injured while they were walking or riding by the side of the road (footpath). One hundred and thirty one(10.58%) of them were injured while they were boarding or alighting a vehicle.

**Use of helmets and seat belts:**

Among the 545 two-wheeler users (riders and pillion) only 158 (28.99%) of them wore a helmet when they were injured, whereas 387 (71.01%) of them did not wear a helmet. 693 (55.98%) of them were other road users.

Between the 492 HMV and LMV users only 66 (13.42%) of them used seat belt. Rest of them did not use a seat belt.

**Presence of driving license among drivers:**

Two hundred and one (16.24%) of drivers did not have valid driving license at the time of RTI occurrence.

**Cause of event:**

Causes responsible for these road traffic accidents are shown in figure-5. Not using indicator lights, not following speed limits, no proper road signs were most common causes responsible for road traffic accidents.
Figure-5: Bar diagram showing causes responsible for these road traffic accidents

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Others</td>
<td>3%</td>
</tr>
<tr>
<td>No road signs</td>
<td>8%</td>
</tr>
<tr>
<td>Vehicle parked on the road without...</td>
<td>29.50%</td>
</tr>
<tr>
<td>Bad weather</td>
<td>8%</td>
</tr>
<tr>
<td>Animal on the road</td>
<td>16.50%</td>
</tr>
<tr>
<td>Driving while drinking</td>
<td>23.50%</td>
</tr>
<tr>
<td>Pillion driving</td>
<td>49%</td>
</tr>
<tr>
<td>Not following speed limits</td>
<td>21%</td>
</tr>
<tr>
<td>Poor maintenance of vehicle</td>
<td>52.50%</td>
</tr>
<tr>
<td>No indicator lights</td>
<td>23.50%</td>
</tr>
<tr>
<td>Overloaded vehicle</td>
<td>45.50%</td>
</tr>
</tbody>
</table>

POST-INJURY FACTORS

Transportation used for reaching Medical Centre

The victims were brought to the hospital by auto 390 (31.50%) of the instances, followed by private vehicle 314 (25.36%). The police used their vehicles to bring 220 (17.77%) of the victims to the hospital. One hundred and three (8.32%) of the victims were transported using a taxi, whereas 61 (4.93%) victims reached the hospital by bus/minibus. Ambulances brought the victims to the hospital 150 (12.12%) of the instances.

DISCUSSION, SUMMARY, CONCLUSION, RECOMMENDATIONS

DISCUSSION

From the results of the study, it is clear that the incidences of the Road Traffic Accidents (RTA) are on the increase and characterized by seasonal factors as can be seen from the high values of the seasonal indices in Table 5 for the months of January, February, May, June, October, November and December. This study is in line with previous studies in developing countries which suggest that RTA has been on the increase. It also agrees with the results of the study by Eke et al. (2000) that there are seasonal variations in RTA cases. However, it is at variance with it with respect to the period where it occurs most. Eke et al. (2000) found that RTAs occur most during the rainy season (June, July and August) while ours are in the first and second quarters precisely in the months of January and December which are dry season period. Considering the fact that heavy road traffics lead to more RTAs, the difference may be explained by the following facts;
• Universities and Polytechnics close for Christmas holidays and students go home in the month of December and to return in the month of January on re-opening

• The heavy traffic on all Nigerian roads of which the Jos road is no exemption as a result of the Christmas festival spanning through 1st and 2nd quarters (1st quarter-January, February and March; 2nd quarter-October, November and December) of the year in Igbo land, Southeastern Nigeria

• The months of May and June are very rainy periods and RTA is expected to occur more during this period as a result of bad road and reduced visibility whenever it is raining

It also agrees with Ezenwa (1986) and Odero (1998) that reckless driving is a lead cause of RTA in Nigeria.

The reason for the high level of RTA involving Motorcycles (McMc and McV) is not far fetched. As a result of the high level of unemployment in Nigeria, a lot of the unemployed youths took to Motor-cycle-riding popularly known in Nigeria as Okada-riding (Okada-riding is the use of Motorcycle as a means of transpoRTAtion) as a means of livelihood without being well grounded in good-road-using capabilities such as ability to read signs and obey traffic rules and regulations. No wonder the Plateau State Government and most other State Governments have banned Okada riding in most of the major cities.

It is not uncommon that reckless driving, a human factor (AUSTROADS, 1994) caused a greater percentage of the RTA. This may be attributed to the fact that many of the students who ply the road with their parents or relatives vehicles are bound to be reckless in driving with a view of impressing their fellow students and most of them are also inexperienced in driving. This factor also partly explained why larger numbers of vehicles, involved in RTAs along the road are private cars. More so, most of the staff of the Institutions live in Jos, the capital city of Imo State and are frequent users of the road with their private vehicles back and forth.

Mechanical fault and road defects (MRD) which is under Vehicle and road and environments factors respectively are also significant cause of RTA. This is in agreement with AUSTROADS (1994) that says that one or more of human, Vehicle and road and environment factors must be involved for RTA to occur. This is attributable to the fact that the conditions of most Nigerian roads are generally poor and majority of the vehicles are fairly used, imported from Europe and Asia (These imported used cars are locally called Belgium) and majority of them have been used for over 15 years in Nigeria.

On the part of inexperience which is a human factor, there are too many I-Can-Drive (ICD) drivers (ICD means just the ability to move vehicles without knowing the rules and regulations guiding road use) using the road of which a good number of the students belong to this class.

On the part of Mini-buses and Taxis, being significantly involved in RTAs is because they are the major means of transport for the students back and forth. This finding is in agreements with
Eke et al (2000), Thanni, and Kehinde (2006). While the former have observed that cars and buses are commonly involved in the casualties of RTAs in Nigeria followed by motorcycles and Lorries, the latter found that minibuses, the popular mode of commercial transportation was involved in 63.9% of RTAs, while cars were involved in 14.8% of cases. Motorcycles and pedal bicycles were involved in 6.2 and 0.6% of cases, respectively while Lorries and trailers were involved in 1.1% of cases each.

**Based on the results of the study, the following preventive measures are suggested:**

- Training of drivers should be made a very serious affair and must be properly supervised by qualified personnel and traffic road control agents
- Drivers’ licenses only issued to those who have passed through a series of Driver and Traffic Safety Tests (DTST)
- Motor vehicles are inspected for roadworthiness before registration. Inspection checklist should include the number of years the vehicle has been used, rear and side view mirrors, windscreen wipers, speedometer, brakes and brake lights, trafficators, reverse and parking lights and so on (Nwokoro, 2005)
- The FRSC, VIO and other Traffic wardens should step up to their responsibilities and should go extra miles during the traffic heavy periods (festive and rainy periods) of high RTA level
- Driver and Traffic Safety Education (DTSE) should be offered as a pre-requisite to the issuance of driving licenses. DTSE should also be offered in Primary and Post-primary schools and Tertiary Institutions.

**CONCLUSIONS**

The fundamental finds of this study are that RTAs in Plateau State, Nigeria are characterized by an upward trend and seasonal effect of an appreciable magnitude. Crashes-Motorcycles-Motorcycle (McMc), Motorcycles-Vehicle (McV) and Vehicle-Vehicle (VV) are the lead types and accounted for the greater number of deaths. Reckless driving, inexperience and mechanical fault and bad roads are the major causes while Private cars, Minibuses and Taxis were predominantly involved in RTA.

The increasing toll of RTA in Plateau State, Nigeria and consequent deaths and injuries constitute a public health problems that requires serious attention since these deaths and injuries may be preventable.
Though the data used in the study were collected on different road, however the finds provides an insight into the trend and characteristics of RTAs in Nigeria.

Road traffic accident in Nigeria has not received the attention warranted considering the magnitude of the problem. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts. 'Safe road' in Nigeria is more of changing our driving behaviour than just blaming the government alone and advocating for good road infrastructure.

Factors that are most responsible for accident on road transportation network have been examined. The study also considered some of the preventive measures needed to reduce the present unacceptable high tallies of accidents on the Nigerian highways. The vehicle, the driver, the road and its environment are among the factors that increasingly cause road accidents in Nigeria. Measures to reduce the rate of road traffic accidents have also been highlighted.

Finally, it is our utmost belief that the preventive measures proffered in this paper will yield spectacular results in Plateau State and Nigeria in general if properly and honestly adopted.

**RECOMMENDATIONS**

1. Privately owned mass transit operators should, as a matter of high priority, introduce and operate comprehensive maintenance and repair programme for their vehicles.
2. The Operators (driver) should be properly trained and then retrained.
3. Transit organization should operate adequate and comprehensive welfare scheme for their employees in general and for the drivers in particular, since the lives of all passengers are in their hands.
4. As a matter of necessity, some of the latest scientific techniques for determining extremely productive schedules for the drivers should now be utilized as the organizations in question have technically out-grown the use of trial and error schemes for addressing such problems.
5. There is need for the various governments to pay sufficient attention to the maintenance of all roads in the federation.
6. Furthermore, the provision of adequate drainage system is one that calls for urgent attention.
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KNOWLEDGE OF PUBLIC HEALTH ETHICS AMONG MEDICAL DOCTORS IN NIGERIA

A Case Study By Dr. Maclawrence Kolapo Famuyiwa, Nigeria
(MBBS, PhD in Public Health Student of Texila American University)
Email:- maclaw196@gmail.com

ABSTRACT

This study is about the level of knowledge of medical practitioners in Nigeria on the principles of Public health ethics and the existence of national code of health research ethics in Nigeria. It is a cross-sectional questionnaire-based study in which 158 medical doctors were involved. Data analysis of the study showed that one hundred and forty (140) respondents completely filled and returned the Questionnaires, which represents a response rate of 88.9%. One hundred and twenty seven (127) Respondents (90.7%) claimed to have had medical ethics as part of their medical education. The Median duration of formal education or exposure to public health ethics was 5 hours (range:0-20\ hours). Eighty four (84) respondents representing 60% of the respondents claimed to be aware of the body saddled with supervising of health research ethics in Nigeria, but only forty seven (47) representing 33.8% of the respondent were able to mention the name of the committee responsible for medical ethics in Nigeria as the National Health Research Ethics Committee NHREC). Sixty eight respondents (48.6%) have a good knowledge of public health ethics. Analysis of the identified public health ethics dilemma shows that end of life was the highest mentioned (77.1%) followed by discharge against medical advice (61.4%) and confidentiality by 60% of the respondent. The study thus concluded that there is obvious inadequacies in public health ethics knowledge among Nigerian medical doctors, and a clarion call should be directed at policy makers to overhaul the present medical education curriculum in Nigeria to include public health ethics at both the undergraduate and post graduate levels.

KEYWORDS

Public Health Ethics, Bio ethics, Nigerian Doctors, NHREC, Ethics Committee, Health researches.
INTRODUCTION

According to Childress et al\(^1\), "Public health is primarily concerned with the health of the entire population, rather than the health of individuals. It encompasses emphasis on the promotion of health and disease and disability prevention; the collection and use of epidemiological data, population surveillance, and other forms of empirical quantitative assessment; a recognition of the many dimensional forms of the determinants of health; and a focus on the complex interactions of many factors – biological, behavioral, social, and environmental – in developing effective interventions." Public health activities also include community collaborations and partnerships for health and the identification of priorities for public health action.

Ethics on the other hand can be said to be the science of morality which traverses different human professions like medicine, military, law and even religion, in recent history, globalization has made the concept to encompass all human endeavours, since it is now applied to pedagogy, business, and other walks of life.

The same codes of conduct used in bioethics are what public health ethics discussions follow. Bioethics contribute immensely by proposing an optimal codes of conduct in medical research and practice. It is thus expedient on public health researchers to ensure an impartial distribution of risks and benefits as well as ensuring informed consent, confidentiality in their studies and interventions.

However the codes established by bioethics are inadequate to address all the issues associated with public health, since this area of study far extends beyond medical care and research in humans. This shortcoming have been elucidated on by many researchers but with none suggesting a separate public health ethics to address this, thus leaving a yawning gap of trying to distinguish public health ethics from bioethics.

Globally, many authors in the past have pointed out ethical issues as the core values in the field of public health, they, in the process identified the differences and similarities between public health ethics and bioethics. Public health ethics can be defined as the identification, analysis, and resolution of ethical problem arising in public health practice and research and it is quite distinguishable from medical ethics. Ethics in public health majorly concerns both the acquisition and application of scientific knowledge targeted at restoring and protecting the health of the general public with great regards to individual independence\(^2,3\). Public health ethics protects the welfare of the individual, as in medicine, as well as protecting individual’s welfare\(^2\). A broader scope of public health ethics includes ethical and social issues arising in health promotion and disease prevention, epidemiology research, and public health practice \(^4,5\). Other ethical consideration in public health relate to the need to ensure a just distribution of public health resources \(^6\).
It has also been emphasized by many authors the mandatory public health measures authorized by public health law (for example placing people with contagious diseases under quarantine) or embarking on activities that clearly infringe on people’s privacy and autonomy when on public health surveillance. Communicating perspectives may sacrifice limiting individual independence on the altar of the common good or public interest (5).

There are still many examples of voluntary public health activities despite the imperative and mandatory legal public health activities. For instance, public health survey is dependent on the support and informed consent of people. Public health practitioners often cited the explications of moral reasoning methods useful for public health research and practice.

The four principles proposed by Beauchamp and Childress are among the most widely used frameworks and offers a broad consideration of medical ethics issues in general, not only for use in a clinical setting.

The Four Principles are general guides that allow judgment in specific cases.

**RESPECT FOR AUTONOMY:** is about respecting the decision-making capacities of autonomous persons; allowing individuals to make reasoned informed choices.

**BENEFICENCE:** is about the balancing of benefits of treatment against the risks and costs; the action of healthcare professional should be in a way that benefits the patient.

**NON MALEFICENCE:** is about avoidance of the causation of harm; the healthcare professional should not harm the patient. All treatment comes with some harm to the patients, even if minimal, but the harm should not be disproportionate to the benefits of treatment.

**JUSTICE:** Distributing benefits, risks and costs fairly; the notion that patients in similar positions should be treated in a similar manner. Ideally for a medical research and practice to be considered “ethical”, it must respect all four of these principles: justice; autonomy; non-maleficence and beneficence.

This review intends to reveal the knowledge of public health ethics among Nigerian doctors in a hospital that offers both secondary and tertiary health care. The study becomes necessary to identify the way to address the problems that Nigerian researchers face on ethical issues in their work as well as examining the issues as it is generally applicable.
AIMS AND OBJECTIVES

1. To assess the knowledge of medical doctors in a hospital offering both secondary and tertiary medical services, in South west Nigeria about public health ethics.

2. To assess their level of education in public health ethics and their satisfaction with the education they have so far received or not in medical ethics in their undergraduate and post graduate education as the case may be.

3. To assess their level of awareness of various ethical dilemmas as they relate to public health research and practice.

4. To assess their knowledge of the existence of health research ethics committees’ regulatory body in Nigeria.

LITERATURE REVIEW

Public health ethics unlike bioethics is free of the ‘Hippocratic Oath’ or any universally accepted code for properly executing an intervention. Public health practice and research is mainly flexible and ingenious except that it is guided by the evidence-based knowledge. They are based on an multivariable process and environments.(8)

Nigeria is a budding democracy with intriguing epidemiological, social, political, and economical ambience. Religion without any doubt has played an important role in public health practice, research and interventions. The neglect of the public health sector by the government of Nigeria, has left this sector in a despicable state, this is worsened by ‘brain drain’ of health professionals, and the few that chose to remain behind were faced with poor remuneration, appalling infrastructure and leadership crisis amongst the various health professionals who felt that doctors need not be the boss, since they are all qualified in their own rights, so many strikes and threat of them have further eroded efficiency and effectiveness of the health sector in Nigeria.

This has made it impossible for the country to sustain or build upon the benefits of vertical interventions like Global Polio Eradication Initiatives (GPEI). It has thus been suggested that the diagonal approach must be taken, where both vertical and horizontal are taken alongside the aspect of socialization in these communities. It is therefore necessary to find a resting place for the principle of camaraderie, so as to ensure accountability and reliability throughout all aspects of the health system, and also it is imperative for the government of Nigeria to emphasize and find a way to disentangle religion from governance, encouraging freedom of religion preference. Also there should be political commitments from the community to the national and
international levels, in order to ensure the fruition of the implementation of public health interventions. (8) Ethics is an arm of philosophy that concerns with distinctions between right and wrong – with the moral consequences of human actions. The ethical principles that arise in epidemiologic practice and research include: Confidentiality, informed consent, respect for human rights, and scientific integrity.

It is routine in public health to juxtapose scientific considerations with political and ethical conflicts. The inquiries of autonomy, persons’ rights, coercion, justice, community, the common good, the norms of research and multi-cultural values are essentially momentous in public health.

Some medical research misadventures, led to the creation of the Belmont Report and the Institutional Review Board (IRB) for the protection of human subjects that are targeted in research. "IRB" is an acronym used by the United States Food and Drug Administration (FDA) and the United States Department of Health and Human services (HHS) to refer to a group whose duty is to review research to assure the protection of the rights and welfare of the human subjects.

Each institution may use whatever name it desires. Regardless of the name chosen, they are subjected to the Agency's IRB regulations when studies of FDA regulated products are reviewed and approved. Under FDA regulations, an IRB is an appropriately established group that has been formally given the designation to review and supervise biomedical research involving humans as subjects. In accordance with FDA guidelines, and IRB is empowered with the authority to approve, require modifications in (to secure approval), and even to disapprove research. This group review serves an important role in the protection of the rights and welfare of human research subjects.

The purpose of IRB review is the assurance, either in advance or by periodic review, that appropriate measures are in place to protect the rights and welfare of humans participating as subjects in the research. To accomplish this, IRBs employ a group process to review research protocols and related materials (e.g., informed consent documents and investigator brochures) to protect the rights and welfare of human subjects of research.

ETHICAL CONTROL OF HEALTH RESEARCHES IN NIGERIA

In Nigeria, The National Health Research Ethics Committee (NHREC) was inaugurated in October 2005 for the strengthening of a mechanism that will ensure the protection of Nigerians as they participate in researches. The committee was an offshoot of the dormant Health Research Ethics Committee which had been in existence since early 1980’s, and had been able to come up with the National Code of Health Research Ethics.
The terms of reference for the committee are to:

(a) Set norms and standards for conducting research on humans and animals, including clinical trials;

(b) Adjudicate in grievances arising from the functioning of health research ethics committees and listen to any complaint of discrimination by any of the health research committees against a researcher;

(c) Register and audit the different activities of health research ethics Committees;

(d) Refer to the relevant statutory health professional council, matters involving the violation or potential violation of an ethical or professional rule by a health care provider;

(e) Recommend disciplinary action as may be prescribed by law or permissible by law to the appropriate regulatory, against any person in deterrence or violation of any norms and standards, or guidelines, set for the conduct of research under this Act; and

(f) Appropriately advise the Federal Ministry of Health and State Ministries Health on any ethical issues concerning research on health.

Prior to the formulation of the National Code of Health Research Ethic in Nigeria, different ethical committees were set up according to institutional and international guidelines, with no uniformity and minimum standards. There was also no coordinating and legally binding enforcement mechanism. Therefore, much undocumented unethical research continues to be conducted in Nigeria as in other developing countries, outside the jurisdiction of ethics committees. In addition, there was no systematic and sustained development of a culture of ethical health research in national institutions.

Where researches were conducted with foreign funds, the only penalty then, when there was non-compliance with ethical standards was to extenuate such funding and extirpate such deterrent researchers from future funding from those same sources but that did not translate to annihilation of funds from other research funds and this coupled with absence of domestic legal regulation of ethical research and non-uniformly successful enforcement of ethical standards through litigation, partly because of weak judicial systems, the absence of enabling laws, and unenforceability of international guidelines such as the Nuremberg Code, Belmont principles, Helsinki Declaration, and Council for International Organization of Medical Sciences (CIOMS) guidelines, the latter have been described as non-legally binding declarative statements that lack the specificity required for legal action,(11) they are therefore not legally enforceable and their contravention in developing countries carries minimal risk to researchers, these aforementioned were then the bane of ethical researches in Nigeria.
THE PECULIARITY OF NIGERIAN CODE FOR RESEARCH ETHICS

The Nigerian Code for Health Research Ethics bears a lot of resemblance to most of the current international health research ethics guidelines, but it veers from them in some important aspects. In order to ensure minimum standards in ethical evaluation of research, the Code mandates all ethics committees in the country to be registered. This registration is renewable biennially and gives the NHREC the opportunity to have an oversight function over institutional ethics committees. Institutions setting up ethics committees are also expected to agree to provide office space, equipment and personnel for these committees, otherwise they risk losing their registration.(12) Ethics committee members and biomedical researchers are also mandated to undergo at least biennial NHREC-approved training in informed consent.(13) The Code requires institutions to appoint HREC administrators, an essential role that has hitherto been largely ignored in many of the efforts to promote health research ethics in developing countries.(14) While HREC members are often rotated, administrators remain the core of sustainable ethics committees by ensuring continuity and providing support. A system of committees’ categorization has also been created so that institutions are motivated to support their HREC and improve them in order to maintain their status or attain a higher one. Categories are also linked to the types of research that institutions’ committees can approve and, by implication, the types of research that can be conducted in institutions.

The Code permits institutions to have more than one ethics committee but limits the authority of the ethics committees to their geographical location or the research activities of the institution’s permanent staff only. This is to prevent “ethics committee shopping” by researchers seeking to avoid rigorous ethical oversight(15). It is without doubt that it is quite expensive to set up ethics committees and to maintain a continuous flow of research proposals which will confer competence and expertise in protocol review, the assumption of the Code is that there may be institutions that may not be able to sustain the establishment and continual functioning of ethics committees. In order for research to be conducted in such institutions, the Code recommended the establishment of cooperative agreements between institutions that have and those that do not have ethics committees so that ethical oversight in the latter institutions will be unhindered.

It has been muted in the research community that central and regional review of protocols can be explored to be a method of providing ethical oversight of multicentre studies in a timely and an efficient manner, with the believe that this will avoid duplication of effort and harmonize outcomes of multiple ethics committees’ review of same protocols.(16,17).

The Code gives opportunities for principal investigators to seek central review of their protocol by the National Ethics Committee at their own prodding or upon referral from their local ethics committees. This recommendation becomes necessary where the research involves many centres or is taking place in institutions or localities where there is no ethics committee. The ethics
committee of an institution may also refer research to the National Committee for review, if, for instance, the research is of such complexity that is beyond what one institution in Nigeria has all the relevant expertise to adequately review and provide oversight function for it.

Individual researchers may also petition the National Committee to review a study where there has been unnecessary delay or conflict with the institutional ethics committee. In such cases, the National Committee may assign the protocol to any institutional committee to review the protocol on its behalf as the “Committee of Record” after which local institutional committees provide continuing ethical oversight if the protocol is approved. Also, the National Committee may inaugurate an ad hoc ethics committee of experts from different institutions within Nigeria or the National Committee can constitute itself into a reviewing ethics committee and exercise all the authorities therein. Institutional ethics committees were preferred to regional ones, though the latter are likely to be more efficient, they carry the risk that ethical review will not be seen as part of the cultural fabric of institutional research programmes and may not adequately support the growth of an ethical research environment within institutions.(17)

The code also recommended a Materials Transfer Agreement between researchers, monitored by the institutional ethics committee and recorded at the National Committee, so as to easily monitor the transfer of biological materials and safeguard the interests of local researchers in international collaborative research that make use of local bio-diversity and resources. Also other agreements like Clinical Trials Agreements, Community Assent, Community Benefits Agreements or Intellectual Property Rights Agreements, may be a sine qua non for studies approval by the institutional ethics committees. Consultations between ethics committees are encouraged when reviewing multicentre studies and researches and must submit ethics review of protocols from different sites to their institutional Health Research Committee for resolution, particularly when there is no uniform outcome of review. The Code also outlines clear processes for ethics committees to provide continuing ethics oversight of studies, suspend studies, amicably intervenes in concerns and issues arising from ethics oversight and recommend cessation of studies to the National Committee. Investigators have procedures to follow in appealing to the local institutional ethics committees and independently to the National Committee in cases of disputes with the institutional committee.

Without mincing words, the most important cogwheel in the effective functioning of ethical committees in developing countries like Nigeria is funding, and several studies have concurred with this(18,19). Some suggestions have been made to overcome this limitation and this include charging for review of protocols, institutional or government support, external funding, or grant assistance. The NHREC agreed that while ethical review of protocols can be rightly said to be of public good that should be supported by the government, it is not a propitious option for governments still grappling with meeting the provision of basic healthcare.(20) Dependence on
external grants alone was not considered a viable long-term option for funding ethics committees. It is permissible for institutional ethics committees to charge fees commensurate with the complexity of the research protocol, source of research funds, and the expected amount of work that would need to be done in order to provide satisfactory ethics oversight. These fees depend on the availability of additional support provided by institutions and other sources to the institutional ethics committees.\(^{(19)}\) Ethics committees and independent ethicists can organise both ethics consultations and ethics training programmes taking due care to avoid conflicts of interest. For quality assurance purposes, ethics education programmes must submit their curriculum and a list of lecturers or resource persons, and their qualifications to the NHREC for approval to ensure that these meet the minimum requirements for education in research ethics that is compulsory for members of ethics committees and biomedical researchers in the National Code at least once every two years.

The ethics guidelines presently in use have been critiqued as to be birthed partly or wholly in response to research ethics crises. For example, the Nuremberg Code came to being as a result of the trial of doctors and scientists that conducted unethical research during the World War II. They are also believed to be biased in that they accord much relevance to the principle of autonomy but neglect current challenges in research ethics such as community interests, placebo use, conflicts about standard of care, resource availability when research is completed, and quality of an adequate informed consent process.\(^{(21-23)}\) The Nigerian Code considers these new paradigms in ethics guidelines and includes explicit information about protecting communities and their interests as well as the application of the ICH-GCP guidelines in clinical trials.\(^{(22-24)}\)

The National Committee presupposes that biomedical researchers and ethics committees’ adherence to the code and other guidelines will depend on the provision of educational programmes as well as enforcement of compliance by the National Committee, and the re-orientation of ethics committee members from the guidelines and processes with which they are already familiar with. Quite a number of ethics committees members are devoid of basic knowledge in modern research ethics and this may elucidate on the common complaints about the quality of ethics review, the natures of issues that ethics committee members raise, and their emphasis on minuscule of the informed consent form to the neglect of other prospects of research protocols. The National Committee therefore encourage continuous education of ethics committees’ members in Nigeria.

**BACKGROUND TO THE STUDY**

Ethics in public health research and practice became very important following the actions of some researchers, of note is the Tuskegee Syphilis Study or, to give it its full nomenclature, the
Tuskegee Study of Untreated Syphilis in the Negro Male, was notorious clinical study that is now known as a synonym for racist and unethical medical experimentation. It was conducted from 1932 to 1972 and nearly 400 impoverished and poorly educated African-American men diagnosed with latent syphilis were involved. For 40 years they were never informed they had syphilis and were never offered treatment for it, even when penicillin became a standard cure in 1947. They were simply told they had ‘bad blood’, which had become an epidemic in the country then.

Also during the World War 2, human experimentations were a series of medical experiments on large numbers of prisoners, largely Jews (including Jewish children) from across Europe, but also in some cases Romanians, ethnic Poles, Soviet prisoners of wars and disabled non-Jewish Germans, by Nazi Germany in its concentration camps mainly in the early 1940s, during World War II and the Holocaust. Prisoners were forced into participating; they did not willingly volunteer and there was never informed consent. The experiments resulted in death, disfigurement or permanent disability.

There is also the experiment by Milgram in 1961 on the conflict between obedience to authority and one’s personal conviction. The researcher examined the justification for acts of genocide by those who were accused at the post-world war II Nuremberg trials who claimed that they acted under orders from their superiors. (25)

Thirdly, a group of children with mental retardation who lived at Willowbrook State Hospital in Staten Island, New York were coerced to be part of the “Willowbrook Study” between 1963 and 1966. These innocent children or subjects were fed with extracts of stools from infected individuals and later injected with more purified virus preparations. The children were callously infected with the hepatitis virus. However, the researchers claimed in defense of their investigation that the vast majority of them would have in any case acquired the infection while at Willowbrook, so to these researchers, it was better for them to deliberately be infected under carefully controlled research conditions.(26,27)

Humphreys, a sociologist, conducted a research tagged "Tearoom Sex" study in the mid- 1960s. He hypothesised that the public and the law enforcement agents and agencies held stereotypical perceptions of men who engaged in impersonal sexual acts with one another in public restrooms. "Tearoom sex", as cunnilingus in public restrooms, has a large chunk of homosexual arrests in the US. Humphreys argued that it was important for society to have a better understanding of the identity of the men as well as what motivated them to seek quick impersonal sexual gratification. He tried to answer this question by the methods of participant or observation and structured interviews. Humphreys stationed himself in "tearooms" and offered to serve as a "watchqueen". The "watchqueen" had the duty to be on the lookout for law enforcement officers or deliberately cough if strangers were approaching the area.
During the study, he observed hundreds of acts of “tea-room sex” and gained the confidence of some of the men he observed. He later revealed his role as a scientist and persuaded them to tell him about their personal lives and drives. To avoid bias, Humphreys surreptitiously tailed some of the men and recorded the license numbers on their vehicles. A year later, Humphreys showed up at their private homes and claimed to be a health service interviewer. He asked them questions about their marital status, job, race and other personal questions. (28)

Humphreys’ findings destroyed many stereotypes. He found that 54 per cent of the men were married and 38 per cent were neither bisexual nor homosexual. Most of them were successful, well educated, financially stable, and highly praised in the community. Only 14 per cent of the men that he observed were homosexuals and part of the gay community. The Humphrey’s research was done in the 1960’s prior to the establishment of the IRB in the United States of America, and other such ethical control bodies all over the world.

In Nigeria, as well as in most parts of Africa, until the inauguration of the National Health Research Ethics Committee in 2005, the mechanism for the effective mechanism for reviewing and implementing research projects on human or animal is practical inchoate, this thus make it arduous for researchers in Africa to get approval for their works from international ethical review boards due to inability to address ethical issues in their protocols.

**MATERIALS AND METHODS**

The study was cross-sectional and questionnaire-based, carried out among medical doctors in a health care facility offering both secondary and tertiary care in South-west Nigeria. All categories of medical doctors-house officers (interns), medical officers, resident doctors (registrars and senior registrars), and consultants. Medical officers are post-internship doctors who are yet to commence residency training were included in the study. Ethical approval was obtained prior to the commencement of the study from the Hospital Research Ethics Committee.

**DATA ANALYSIS**

Data were analyzed for bio-data, response regarding undergraduate and postgraduate training in medical ethics, respondents' attitude to medical ethics training, knowledge about the principles of biomedical ethics and the ethical dilemmas encountered in daily medical practice IBM SPSS version 19. Descriptive statistics was used to obtain the general characteristics of the study participants. The Chi-square test was used to determine the level of significance of groups of categorical variables. P values <0.05 were considered significant.
RESULTS

TABLE 1: Age Distributions

<table>
<thead>
<tr>
<th>Age Range</th>
<th>No of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-34</td>
<td>72</td>
<td>51.4</td>
</tr>
<tr>
<td>35-44</td>
<td>53</td>
<td>37.9</td>
</tr>
<tr>
<td>45-54</td>
<td>15</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td><strong>140</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 1 shows that 51.4% of the respondents were within the 25-34 age range, 37.9% within the age range of 35-44 and 10.7% within the age range 45-54. The median age was 34.7 years, the mode was 32.9 years and the mean was 35.4 years.

Table 2: Distribution of respondents by gender and positions

<table>
<thead>
<tr>
<th>Gender</th>
<th>House Officer</th>
<th>Med Officer</th>
<th>Registrar</th>
<th>Srn Registrar</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>36</td>
<td>13</td>
<td>21</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>7</td>
<td>18</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total (%)</td>
<td><strong>58 (41.4)</strong></td>
<td><strong>20 (14.3)</strong></td>
<td><strong>39 (27.8)</strong></td>
<td><strong>15 (10.7)</strong></td>
<td><strong>8 (5.7)</strong></td>
</tr>
</tbody>
</table>

Table 2 shows the distribution of respondents by gender and position.

Out of the one hundred and fifty-eight (158) questionnaires handed out to respondents, only one hundred and forty (140) of them were returned completely filled, this accounted for about 89% response rate. The Male accounted for about 61% of the respondents while female respondents accounted for the remaining 39%. Also 41.4% of the respondents were medical house officers, 14.3% were medical officers, 27.8% were registrars, 10.7% were senior registrars, and 5.7% were consultants.

The distribution of the resident doctors and consultants among the respondents by area of specialties shows that 19 (30.7%) were from Community Health, 14 (22.6%) were from Surgery, 11 (17.7%) were from Internal Medicine, 10 (16.1%) were from Paediatrics and 8 (12.9%) were
from Obstetrics and gynaecology. House officers were deliberately left unclassified into medical specialties, since their programme involve a mandatory rotation through the various medical specialties’ departments of medicine, surgery, obstetrics and gynaecology as well as paediatrics.

Table 3: Knowledge of principles of public health ethics by different categories of medical doctors

<table>
<thead>
<tr>
<th>Principles</th>
<th>Autonomy</th>
<th>Beneficence</th>
<th>Non-maleficence</th>
<th>Justice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>House Officers</td>
<td>32(55)</td>
<td>26(45)</td>
<td>49(85)</td>
<td>9 (16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30(52)</td>
<td>28 (48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30(52)</td>
<td>28(48)</td>
</tr>
<tr>
<td>Medical Officers</td>
<td>9 (45)</td>
<td>11(55)</td>
<td>3 (15)</td>
<td>17(85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13(65)</td>
<td>7 (35)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 (28)</td>
<td>14(70)</td>
</tr>
<tr>
<td>Junior Registrars</td>
<td>14(36)</td>
<td>25(64)</td>
<td>18(46)</td>
<td>21(54)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24(62)</td>
<td>15 (39)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>19(49)</td>
<td>20(51)</td>
</tr>
<tr>
<td>Senior Registrars</td>
<td>12(80)</td>
<td>3(20)</td>
<td>12(80)</td>
<td>3 (20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15(100)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11(73)</td>
<td>4 (27)</td>
</tr>
<tr>
<td>Consultants</td>
<td>7(88)</td>
<td>1 (12)</td>
<td>8(100)</td>
<td>0(0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8(100)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8(100)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Table 3 showed the breakdown of the four individual principles (respect for individual’s autonomy, beneficence, non-maleficence, and justice), there is a significant difference in the knowledge base of more junior doctors (house officers, medical officers and junior registrars in comparison with more senior ones (senior registrars and consultants), the chi square values for the four core ethical principles are: autonomy 13.410 (P value of 0.009), beneficence is 43.107 (P value 0.000), non-maleficence is 16.897 (P value 0.002) and justice is (14.15) (P value 0.007) respectively, and these values are of great statistical significance.

One hundred and twenty seven (127) that represent about 91% of the respondents claimed they have had a reasonable medical ethics education as part of their undergraduate medical education curriculum. The median duration of formal education in medical ethics education was 5 hours, the range was 0-20 hours. Majority of the respondents (87%) believed this education was grossly
inadequate, the general belief among the participants was that basic medical education should incorporate more of training in medical ethics.

About 61% updated their knowledge of medical ethics after their graduation from medical schools by reading materials on the internet and medical journals (42.3% and 28% respectively), and continuous medical education (17.1%). One hundred and seven (107) representing 76.4% of the respondents believed that medical ethics is very important while remainder of the respondents felt it may just be important. Eighty four (84%) have read the code of medical ethics of the Medical and Dental Council at least once, and sixty eight (68%) have some basic knowledge of the principles of public health ethics.

Table 4: Ethical dilemma encountered by the medical doctors

<table>
<thead>
<tr>
<th></th>
<th>Informed Consent</th>
<th>Confidentiality</th>
<th>Resource Allocation</th>
<th>Conflicting Interest</th>
<th>DAMA*</th>
<th>Religion &amp; Culture</th>
<th>End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>House Officer</td>
<td>32</td>
<td>26</td>
<td>14</td>
<td>44</td>
<td>30</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>(55)</td>
<td>(45)</td>
<td>(24)</td>
<td>(76)</td>
<td>(52)</td>
<td>(48)</td>
<td>(21)</td>
</tr>
<tr>
<td>Medical Officer</td>
<td>9</td>
<td>11</td>
<td>12</td>
<td>8</td>
<td>14</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(45)</td>
<td>(55)</td>
<td>(60)</td>
<td>(40)</td>
<td>(70)</td>
<td>(30)</td>
<td>(55)</td>
</tr>
<tr>
<td>Registrar</td>
<td>19</td>
<td>20</td>
<td>12</td>
<td>27</td>
<td>31</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>(49)</td>
<td>(51)</td>
<td>(31)</td>
<td>(69)</td>
<td>(79)</td>
<td>(21)</td>
<td>(36)</td>
</tr>
<tr>
<td>Senior Registrar</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>(47)</td>
<td>(53)</td>
<td>(67)</td>
<td>(33)</td>
<td>(40)</td>
<td>(60)</td>
<td>(93)</td>
</tr>
<tr>
<td>Consultant</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>(50)</td>
<td>(50)</td>
<td>(75)</td>
<td>(25)</td>
<td>(38)</td>
<td>(62)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

DAMA= Discharge Against Medical Advice
Table 4 shows the analysis of the identified public health ethical dilemma and reveals that end of life was the most identified by the 77.1% of the respondents, followed by discharge against medical advice (61.4%), confidentiality was indicated by 60%, religion and culture (55%), informed consent (50.7%), conflict of interest (42.1) and just resource allocation (37.9%). The respondents showed a fairly good knowledge of issues bordering on end of life matters, discharge against medical advice, confidentiality, religion and culture and informed consent while they exhibited a poor knowledge on just resource allocation and conflict of interest.

Ethical dilemmas in daily practice were identified by 68.2% of house officers, 75.6% of medical officers, 67.7% of junior registrars, 95.3% of senior registrars and 100% of the consultants.

DISCUSSION

The junior doctors (house officers, junior registrars) and the people in the age range of 25-34 years in this study were in the majority, this is not a departure from what is applicable in all tertiary facilities, where there is post graduate residency training of medical doctors all over the world. The male doctors are in the majority forming about 60.7% of the respondents; this may be due to the possibility that more males desire medical education in Nigeria, where it is perceived erroneously as a profession for men, though this perception is being gradually eroded.

The department of community health (31.5%) had the majority of the participants in the study among the resident doctors (junior registrars and senior registrars) and when the consultants are included in this classification, they constitute 30.7% of the participants this was probably because they were the ones most interested in the subject of the study.

About 60% of the study population said they have read at least once the code of medical ethics, a finding very close to that of Fadare et al., where 69% of Nigerian medical doctors in a study conducted in the same geographical location with this study have read the Medical and Dental Council of Nigeria’s code of medical ethics (45), though only forty seven (47) representing 33.8% of this present study was not oblivious of the National Health Research Ethics Committee (NHREC) as the body mandated by law to monitor different research ethics committees in Nigeria. The study also revealed that medical ethics is well taught in the Nigerian medical schools at the undergraduate level since 90.7% of the respondents have some levels of education on medical ethics as a subject with a media duration of 5 hours (range 0-20 hours).

In a study done in India, 76.5% of the participating doctors had some form of formal education in medical ethics while it was only 10% in another study done in Pakistan, that had any form of medical undergraduate teaching in medical ethics. (30,31) (87%) of the respondents considered the undergraduate medical ethics curriculum to be very inadequate, this is similar cited study by
Fadare et al., where 86% of the respondents sharing the same opinion. The common agreement amongst the respondent was that medical ethics programme should be broader based and better structured and should be inculcated into both the undergraduate and postgraduate medical training curriculum. The clamour for better structured and culturally friendly medical ethics education to encourage medical doctors to comprehend and adapt to the continual changes in the nature of the public health ethical dilemmas they face in their daily practice. (32,33,34)

This study reveals that 61% of the respondents have taken the pain to personally upgraded their knowledge base in public health and medical ethics by mainly getting the materials through the internet and reading from journals, though none mentioned extra efforts of taking extra courses on this important branch of medicine. It is gratifying that there are now available on the internet, courses on public health ethics, which medical doctors can avail themselves of, for their flexibility and content richness. (35)

About 58.6% of the respondents know about the principles of medical ethics, but this knowledge is significantly varying. Both the principle of beneficence and justice were rightly recognized by 64.3% of the respondents respectively while both respect for persons (autonomy) and non-maleficence were known by 52.9% of the respondents respectively while this level of knowledge is not as pathetic as that found out in the study by Fadare et al, done in similar geographical location with this study, since in their own study the knowledge 66.8% of the respondents were aware of the principles of biomedical ethics but only 55.6%, 48.7%, 40.2% and 31.7% of the respondents in their study knew about the principle of respect for persons (autonomy), beneficence, non-maleficence and justice respectively.

This level of knowledge is still very low considering the fact that these four principles of medical ethics is the bed rock of public health practice and researches in particular and medicine in general.

The level of knowledge of ethical dilemma they faced in their daily practice is about average, since only 55.9% of the respondents were able to know about these public health dilemmas, with 77.1% knowing that end of life is one of these dilemma, 61.4% agreed that discharge against medical advice is one of them as well, while resource allocation were chosen by 60% of the respondents, while the other public health dilemma of religious and culture (55%), informed consent (50.7%), conflicting interest (42.1%) and confidentiality (50.7%) were the other ethical dilemma identified by the respondents. This level of knowledge at best is still on the average, since the identification of obvious cases of public health dilemma will escape the scrutiny eyes of the doctors in the way cases are managed, which means this will have a serious implications on patients’ management outcome, doctor-patient relationship and the social interactions that goes along with this.
CONCLUSION

THE FOLLOWING CONCLUSIONS WERE MADE BASED ON THE FINDINGS OF THIS STUDY:

There is a poor knowledge of public health ethics as part of the medical ethics by the respondents, only 48.6% of the respondents exhibited a good knowledge of public health ethics.

Majority of the respondents are unaware of the National Code of Health Research Ethics and the existence of a committee, the National Health Research Ethics Committee, as a supervising body of all ethical issues in Nigeria. Only 33.8% were able to mention the name of the committee, though 60% of the respondents claimed to be aware of the existence of the committee.

Majority (87%) of the respondents believed the present medical curriculum at both the undergraduate and postgraduate levels are grossly inadequate and would want an overhaul of the curriculum to accommodate more of public health ethics as part of medical ethics as a subject.

RECOMMENDATIONS

The medical education in Nigeria is ripe for a review to inculcate the teaching of medical ethics as part of both the undergraduate and postgraduate medical education in Nigeria.

Continue medical education in medical ethics should be given more prominence in post qualification training of medical doctors.

It won’t be out of place if certificate courses or higher degrees in medical ethics can be available for medical doctors to pursue.

REFERENCE


THE OPINIONS OF PHARMACISTS IN ONDO STATE, NIGERIA, TOWARDS THE INCLUSION OF HIV SERVICES INTO COMMUNITY PHARMACIES

A Case Study By Olatoun Adefunke Adeola, Nigeria
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ABSTRACT

The purpose of this study is to ascertain opinion of pharmacists on the inclusion of HIV interventions into community pharmacy. This includes their willingness to deliver HCT and ARV services, their perceived knowledge of HIV management and the adequacy of personnel and infrastructure at community pharmacies.

In the course of this study, the survey method of descriptive research was used. It was implemented through the collaboration of the Ondo State branch of the Pharmaceutical Society of Nigeria (PSN) during the celebration of the World Pharmacy Day 2013. This afforded the opportunity of having pharmacists working in various health fields together under one roof. The main instrument of data collection was a pre tested questionnaire. The responses were entered into an excel data base with the data analysis done using tables and percentages. The result of the analysis revealed the readiness of pharmacists to accept the incorporation of HIV services into community pharmacy. It also revealed that Community Pharmacists in Ondo State are enthusiastic and willing to be included in HIV service provision. Integrating HIV services into their services would support an increased uptake of prevention services, expansion of access to HCT, PMTCT, and ART services.

KEYWORDS

HIV, AIDS, pharmacists, Community Pharmacy, Ondo State, Anti-Retroviral drugs.
INTRODUCTION

The AIDS pandemic continues to spread globally with sub-Saharan Africa being the worst hit region. Nigeria has been regarded as the nation with the third largest number of HIV/AIDS patients globally after India and South Africa according to the WHO global reports on HIV/AIDS situation 2012. The trend of HIV prevalence in Nigeria peaked in 2001 at 5.8%. It declined to 4.4% in 2005. It is now plateauing between 4.4% (2005) and 4.1% in 2010 according to the National adult ART guideline 2010.

More than 30 years into the pandemic, HIV infection has continued to spread globally. Research indicates that people unaware of their HIV infection contribute disproportionately to the rate of the ongoing transmission rate. According to the National Institute of Health report of August 2013, in the United States, about 50% incident HIV infections can be attributed to the 20 percent of people living with HIV that are unaware of their infection. Globally, more than 60 percent of people living with HIV are unaware of their HIV status.

Persons who are aware of their HIV-positive status are more likely to reduce or eliminate behaviors that may expose others. Those that initiate and adhere to antiretroviral therapy are much less likely to be infectious to others. Research leading to strategies that will encourage individuals to learn their status and to link persons to care, treatment, and prevention services is a high priority.

Access to healthcare remains particularly poor among low-income and minority populations – groups that shoulder the highest HIV burden. We have been looking for new ways to reach out and offer testing to individuals in these groups and bring them into care if they need it. Unless integrated strategies that successfully accomplish each of these objectives are developed, it is unlikely that the goal of an “AIDS-free generation” will be achieved.

The Federal government of Nigeria has shown an unrelenting commitment to HIV/AIDS care through awareness, voluntary counseling and testing center and availability of anti-retro viral drugs in partnership with local and foreign organizations.

Pharmacists have been recognized to be very important in the delivery of high standard of care to patients. With the advent of antiretroviral drugs for the management of HIV and drugs to manage associated opportunistic infections, their role has received more significance.

According to Pharma ONE & Pharma News a privately owned pharmacy plus health news media October 2013 release, a Community Pharmacy is a Pharmacy that deals directly with people in a local area or community. It has responsibilities including compounding, counseling, checking and dispensing of prescription drugs to the patients with care, accuracy, and legality. A Community Pharmacy has appropriate procurement, storage, dispensing and documentation of medicines. It is an important branch of the Pharmacy profession and involves a registered Pharmacist with the education, skills and competence to deliver the professional service to the community.
There are 44 Community Pharmacy outlets in the state which have a registered Pharmacist and the outlets are registered with the Pharmacist Council of Nigeria.

RESEARCH PROBLEM

Will the pharmacists in Ondo State accept the inclusion of HIV counselling and testing and ARV dispensing into community pharmacy.

THE PURPOSE OF THE STUDY

Purpose of this study is to understand the opinions of pharmacists on the inclusion of HIV interventions into community pharmacy. This is to ensure that more people become aware of their HIV status and more PLHIV have access to ARV in the community they live.

OBJECTIVES OF THE STUDY

To determine the Percentage of pharmacists in Ondo State that are positive towards the inclusion of HIV care and services

To ascertain the Percentage of pharmacists in Ondo State that are adequately staffed to render HIV care and services.

To establish the Percentage of pharmacies in Ondo State that are structurally ready in Ondo State to be included into community pharmacy

To determine the Percentage of pharmacists in Ondo State that require capacity building on HIV care and services.

RESEARCH QUESTIONS

Are pharmacists in Ondo State willing to incorporate HIV services into community services?

Do pharmacists think that the incorporation of HIV services community pharmacy will impact negatively on their patronage?
SIGNIFICANCE OF THE STUDY

The discovery of Anti-Retroviral drugs (ARV prescription and refill is the backbone of ART) has led to an increase in the number of People Living With HIV (PLHIV). This together with the fact that personnel and infrastructure development are not increasing has made the burden of health delivery to be overwhelming on the healthcare providers at the facility. There is therefore a need to involve non facility based health providers such as community pharmacy in the management of the HIV epidemic. A study on the inclusion of community pharmacy into HIV care will provide new perspectives on how best this option can be explored to further improve the delivery of quality care to PLHIV.

ASSUMPTIONS IN THE STUDY

The study assumed that:

The participants in this study will fill the form honestly. On the questionnaire, they were assured of confidentiality and the name was left optional.
Participants of this study are a good representative of pharmacists in Ondo State, thus the study will be conducted during an event that a large percentage of pharmacists in the State will be in attendance.

The burden of ART will continue to grow because the PLHIV will be on ARV for life as a cure for the HIV is yet to be found, thus the need to involve community pharmacies in ART.

LITERATURE REVIEW

According to the Ndukwe et al., Novel Science International Journal of Pharmaceutical Science (2012)the components of a Comprehensive Integrated HIV/AIDS Service at the Community Pharmacy level will involve a model that consists of:

*Prevention*: Advocacy and mass education, management of STIs; behavior change in people with/without HIV; safety of blood products.

*Care and Treatment*: Basic medical care; home-based care; community-based care; referral network; palliative care; nutritional care; ART and opportunistic infections therapy.

*Impact Mitigation*: Orphans, vulnerable children; supportive policies; stigma reduction,

*Infrastructural Development*: Human capacity; drugs and commodities; resource management; research.
Some of the major services that a Community Pharmacy provides are also the tools that are used to effect integration of services among members of the health profession. These include HCT (HIV Counseling and Testing), PMTCT (Prevention of mother-to-child transmission), Psychosocial Counseling, Monitoring and Evaluation, Behavior Change in people with chronic diseases or syndrome.

Integrating Reproductive Health Care, Tuberculosis (TB) and HIV/AIDS Services in the Community Pharmacy as a strategic goal will contribute to achieve overall improvements in access to HIV and Tb prevention, treatment, care and support services towards achieving the universal access targets and MDGs. Opportunities are arising on a daily basis for community pharmacists to function as clinically as their hospital-based counterparts. Many of these pharmacies have started to offer free blood pressure checks and or blood sugar testing; some have gone to the extent of performing health screenings such as lipid panels and HIV screenings. Thus, pharmacists are becoming leaders in diabetes or hypertension management and are proficient in discussing these subjects with their patients.

According to a publication in Drug Topics, July 2013 (an online pharmaceutical magazine) as services for some disease states have flourished, those for other treatment areas such as oncology, mental health, and HIV/AIDS seem to be dropping in community pharmaceutical care. With regards to HIV treatment, many community pharmacists are confused by the extensive array of medications, the complex regimens, the question of whether a regimen is correct, or even the best way to counsel patients in the use of these medications.

Community Pharmacies, if given the mandate by relevant governmental agencies, would support an increased uptake of prevention services, expansion of access to HCT, PMTCT, and ART services. It would enable increased provision, access and uptake of TB/DOTs services, malaria diagnosis and treatment as well as reproductive health services, and would strengthen the existing health systems.

Counseling as a preventive measure has recorded huge successes all over the world. Counseling is an integral part of the provision of pharmaceutical care. It has served as an empowerment for even the illiterates. Community pharmacies are, therefore, well positioned to lead the course in health promotion, education, and disease prevention advocacy and implementation programs. When people are given the right counsel at the appropriate time, their health-seeking behavior and their responses to health issues are positively influenced.

A NIGERIA CASE STUDY

The Global Health Access Initiative Project in Conjunction with Howard University Continuation Education project (HUCEPACE) trained Community Pharmacists to act as Palliative care and referral points to help increase accessibility to HIV AIDS care and support.
APPROACH

Advocacy meeting with the members of Association of Community Pharmacies in Lagos, Edo, Cross River, Kano, Anambra and Federal capital Territory of Nigeria were conducted.

INITIAL RAPID ASSESSMENT

An initial tool for rapid evaluation of the capacity of the community Pharmacies was developed. The indicators evaluated include: Staff strength, Quality of Pharmacy services, Volume of clients, Willingness to partake in HIV/AIDS programme, Staff with training on HIV/AIDS, Stock or have experience with ARV drugs, Provides services for STI, TB and HIV infections, Stock rapid test kits, drugs for STIs and OIs, Proximity to high risk settings, Proximity to identified clusters of PLHIV, Proximity to HIV/AIDS care centres.

The initial rapid assessment shows that most Community Pharmacies see an average of 350 clients weekly have often been referred to as the most accessible health professional and therefore have an opportunity to openly interact with many in their communities. The report also showed that 66% of the Community Pharmacies routinely provides care and drugs for STIs, TB and other opportunistic infections, while 70% have seen 5-20 suspected HIV infected clients, 62% has dispensed prescribed drugs for HIV infection. This undoubtedly shows the potential of the Community Pharmacies to support the clients at home within the community and has established good relationships with them.

SKILL CERTIFICATION

The primary training method for equipping the Community Pharmacists was the skills certification process. The process began with didactic training, followed by onsite mentoring, hands on seminar and follow up.

PROVISION OF PALLIATIVE SERVICES

The community Pharmacies in most communities are seen as the first point of call for both therapeutic and psychosocial support services because of the absence of sometime frustrating appointment systems. This strategic role was identified by the HUCEPACE and developed in this program to improve the capacity of Community Pharmacies to deal with palliative care issues in HIV/AIDS conditions. Following the capacity building and hands on mentoring provided by HUCEPACE participating community Pharmacies now provide and document palliative care services to identified PLWHA and clients suspected to be at risk. The number of clients provided with palliative care services rose from 504 to 1813 in just over one year of the
In this program the Community Pharmacies also served as referral points for Voluntary Counselling and testing as well as HIV/AIDS care and treatment.

**AUSTRALIA CASE STUDY**

In the year 2013 the 8th national LGTBI (Lesbians, gays, bisexual, transgender, intersex and other sex and gender transverse people) conference held in Australia. (The National LGTBI alliance is a coalition of individuals across Australia that work to improve the health of Lesbians, gays, bisexual, transgender, intersex and other sex and gender transverse people.) In the conference one of the major issues discussed were ways to improve the well-being of People Living with HIV/AIDS. Two major resolutions they came to are:

**ACCESS TO ADEQUATE DENTAL CARE**

One of the most important health issues for PLWHA is access to adequate dental care, given that the vast majority of people with HIV will develop at least one oral condition associated with HIV disease. According to the LGBTI, these conditions like candidiasis and hairy leukoplakia, may be the first indication of immune suppression associated with HIV infection and in many people are the first signals that lead doctors to encourage HIV testing. Many of the conditions are eminently treatable but treatment is reliant on the sort of regular dental checkups/professional interventions that are increasingly difficult for HIV positive people to access and sustain due to a lack of Commonwealth funding for public dental health care.

**HIV MEDICATION IN COMMUNITY SETTINGS**

The current regime for the distribution of specialist HIV medication in Australia is through a limited number of specialized settings such as hospitals and select Pharmacies. Such a regime places burden on PLHIV who in most cases must travel significant distances and wait for a considerable amount of time before receiving their medication. Allowing HIV medication to be distributed through Community Pharmacies will be an important step in alleviating some of the stress that PLWHA must go through in order to access their treatments.

It was decided that the changing nature of the lives of PLHIV in Australia means that the Commonwealth must effectively respond to a range of issues including, but not limited to, access to adequate dental care and HIV medication. The response should include:

- Ensuring that low-income PLHIV have adequate access to dental health services for HIV-specific as well as general oral health care

Putting in place processes to allow HIV positive patients to obtain their specialist medication in community settings (such as local pharmacies) rather than having to attend a hospital or special clinic for this purpose.
UNITED STATES OF AMERICA CASE STUDY

A study in the August issue of the journal *AIDS Patient Care and STDs* by researchers at Albert Einstein College of Medicine of Yeshiva University revealed that community-based Pharmacies can be effective locations for offering rapid HIV testing, diagnosing HIV, and connecting those who test positive with medical care quickly. Public Health Advocates (PHAs) were trained to approach people in the Pharmacies and on the sidewalks outside to offer HIV testing.

When an individual agreed, the PHA would administer the rapid HIV test, which needs only a swab of saliva and provides results in 20 minutes. While waiting for the results, the PHAs asked the participants to fill out an HIV-risk factor and test satisfaction questionnaire, and then counseled them about HIV-risk reduction behavior based on their answers. If the HIV test result was positive, the PHA offered to escort the participant to a nearby HIV clinic where they were seen immediately by an HIV specialist. All participants were allowed to accept or decline the escort. HIV-positive clients saw an HIV specialist less than an hour after being diagnosed on the average.

During the 294 testing days, 2,030 individuals agreed to HIV testing, with 60 of them testing positive. Five of these six agreed to accompany the PHA to a HIV clinic. Their median CD4 count on further investigation was 622 white blood cells/mL, indicating they were diagnosed at a relatively earlier stage of infection. The results demonstrate that pharmacies can effectively supplement the current healthcare system for HIV testing.

According to another study by researchers at the Indiana University School of Public Health-Bloomington, the Rural Center for AIDS/STD Prevention and Butler University College of Pharmacy and Health Sciences, Community pharmacists in the United States have a unique opportunity to consult with customers about HIV treatment when selling over-the-counter HIV tests. In a study lead by Beth Meyerson, licensed community pharmacists in Indiana indicated that they wanted an active consultation role when customers purchased over-the-counter HIV tests. They understood the advantage of greater access to HIV testing, but felt that their role as pharmacists was beyond that of OTC test seller. She said rural communities have the most to gain from an engaged pharmacy environment because these communities often lack an HIV testing and treatment infrastructure, and people often feel stigmatized about HIV testing.

According to the report, the engagement of pharmacists especially in low income settings might help in increasing the number of those who test for HIV and also the number of people linked to HIV treatment.
POSSIBLE STRATEGIES FOR THE INCLUSION OF HIV SERVICES INTO COMMUNITY PHARMACIES IN ONDO STATE NIGERIA INCLUDE:

Empowerment of community pharmacists to carry out HIV counselling and testing. One or two workers in these Pharmacies will be trained on HIV counselling and testing after which rapid HIV antibody test kits will be supplied to the Pharmacies. Billboards or posters (IEC materials) showing that people can access free voluntary HCT should be placed outside the respective Pharmacies and every one that comes to purchase drugs in the Pharmacies will be offered voluntary HIV counselling and testing.

There will be adequate linkage/referral system between the Pharmacies and Hospital and everyone who tests positive will be appropriately linked to the hospital where he or she can receive care and treatment. Community Pharmacies can be empowered to dispense antiretroviral drugs. The Pharmacists that own or work in Community Pharmacies will be trained on the Pharmaceutical care of People Living with HIV/AIDS and Logistics and inventory control management. The Pharmacies should be supplied with ARVs regularly and clients can then bring their prescriptions from Doctors in hospitals to get a refill.

METHODOLOGY

The study was conducted during the world pharmacy day celebration in Ondo state. During this event a large number of pharmacists in the State from different industries are expected to be in attendance as one of the mandatory Continous Medical Education courses was conducted as part of the activities to mark the day. Hard copies of the questionnaire were printed for distribution during the program.

The Ondo state branch of the Pharmaceutical Society of Nigeria (PSN) was carried along in this study. Their consent was sought to have randomly selected pharmacists fill the prepared questionnaire. A general address was given before the program, then questionnaires were distributed to explain the purpose of the study and the intended outcome.

STUDY DESIGN: An observational cross sectional survey was conducted.

DATA SOURCES: The data is a survey data collected form questionnaires distributed during the world pharmacy day celebration in Ondo State, Nigeria.

SAMPLE SIZE: Non random sampling was done among participants that attended the World Pharmacy Day celebration, where Continuous Medical Education was conducted. One hundred out of 140 registered pharmacists in Ondo State were expected to attend this program. The 1st 50
participants (about 1/3 of the total population in the State) were be selected to fill the questionnaire.

**DATA COLLECTION:** This project utilized the qualitative data collection (using the questionnaire).

The questionnaire was administered at the celebration of the world pharmacy day before the commencement of the world pharmacy day activities and was self-administered. The questionnaire was returned on the same day after it had been duly filled. All the 50 respondents administered the questionnaires returned their questionnaires. Information on the filled questionnaires were entered on windows excel spreadsheets for analysis.

**DATA ANALYSIS:**- It was done using the advanced windows excel spreadsheet. This was used to generate tables and charts used in data analysis.

**FROM THE ANALYSIS OF THE QUESTIONNAIRES**

Table 1 shows that, 36% (9:25) of the respondents were female, while 64% (16:25) were males

In Table 2, 58% (29:50) of the respondents were community pharmacists, 28% (7:25) were hospital pharmacists, 8% (2:25) work in the administrative pharmacy sector and while 6% (3:50) work in the pharmaceutical industry.

All the 50 participants (100%) agreed that HIV care should be incorporated into Community Pharmacy practice. Most of the participants (94%) are of the opinion that Community Pharmacies in Nigeria have the capacity to do HIV counselling and testing. A large percentage(96%) which is 47 of the 50 participants are of the opinion that Community Pharmacies in Nigeria have the capacity to dispense antiretroviral drugs. All the 50 participants (100%) said HIV care should be incorporated only into Community Pharmacies that have a registered Pharmacist.

A considerable proportion (68%) in ratio 17:25 of the participants agreed that they have sufficient staff in their Community Pharmacy outlet that can handle the clients in case HIV services are incorporated into Community Pharmacy practice, 9% (1:10) of participants said they do not have sufficient staff while 23% (11:50) said they were not sure. Most of the participants (95%) said the staff will need training in the ratio 24:25. A Large proportion (77%) of participants said there is adequate space in their Community Pharmacy for counselling, to store drugs and test kits while 23% said they were not sure. The result revealed that 72%(18:25) of participants said they have adequate storage conditions for drugs e.g an airconditioner, 9% (9:10) said they do not have while 19% (1:5) said they were not sure.

With respect to proximity to a hospital, 64% (16:25) of participants said they have a Hospital close to their Pharmacy outlet where they can refer clients to, 6% (3:50) said there is none and
30% (3:25) said they are not sure. Analysising their interest, 67% (17:25) of participants indicated that they are interested in offering HIV services in their outlets while 30% (3:10) said they are not sure. Most of the participants (73%) in the ratio 37:50 are of the opinion that HIV clients will not mind accessing treatment in their Community Pharmacy outlets.

**DISCUSSION**

The analysis showed that pharmacists in Ondo State were enthusiastic about the inclusion of HIV services into community pharmacy. This is evident by proportion that agreed to the concept and are willing to carry it out.

Although the pharmacists were enthusiastic, a high percentage needed to be trained. Though a lot of HIV care and treatment capacity building is ongoing in Ondo State by State agencies and implementing partners, the pharmacists seem to have been left out in all these trainings. Capacity building is one of the key ingredients of a successful HIV program especially with respect to pharmaceutical care and drug logistics. The dynamism of HIV management makes it compulsory to refresh whatever has been taught in in the course of the university education with respect to HIV.

Against the backdrop of shortage of health personnel and poor infrastructural development of health facilities (community pharmacy inclusive) it was surprising that more than half of the respondents felt they had adequate space and personnel to implement community pharmacy. This may suggest a high level of zeal on the part of the pharmacists, knowledge gap on the storage requirements of ARVs and also a need for standard situational analysis of these pharmacies before rolling out the inclusion of HIV services. The fact that more than 50% of the respondents are community pharmacists gives the assurance that the respondents well informed about community pharmacies.

Also, the fact that 64% of the respondents were confident of a hospital close to their pharmacies shows the need for strong linkage and referral network. This referral can be two–way with community pharmacies referring HIV positive clients to the nearest hospital and hospitals referring stable patients on ART to community pharmacies for ARV pick up.

**TABLES AND CHARTS**

**Table 1 showing the Sex distribution of respondents**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32</td>
<td>64%</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>36%</td>
</tr>
</tbody>
</table>
Table 2 showing the workplace of respondents

<table>
<thead>
<tr>
<th>Category of Pharmacist</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Pharmacist</td>
<td>29</td>
<td>58%</td>
</tr>
<tr>
<td>Hospital Pharmacists</td>
<td>14</td>
<td>28%</td>
</tr>
<tr>
<td>Administrative sector</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Pharmaceutical Industry</td>
<td>3</td>
<td>6%</td>
</tr>
</tbody>
</table>

Chart 1 showing response to Questions

Chart 2 Showing Opinion on Adequacy of Personnel and Facility

CONCLUSION

The community Pharmacies in most communities are seen as the first point of call for both therapeutic and psychosocial support. Community Pharmacists in Ondo State are enthusiastic and willing to be included in HIV service provision. Integrating HIV services into their services would support an increased uptake of prevention services, expansion of access to HCT, PMTCT, and ART services. This strategic activity will contribute to achieving overall improvements in access to HIV prevention, treatment, care and support services towards achieving the universal access targets and MDGs.
REFERENCES


A STUDY ON SOCIO-ECONOMIC STATUS AND SOCIAL CAPITAL OF RURAL COMMUNITY MEMBERS IN SOUTH-WEST NIGERIA

A Case Study By Mrs. Oluwakemi Tomori Edet-Utan, Nigeria.

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ABSTRACT

The relationship which exists between social capital and socio-economic status of dwellers in rural Nigeria has been poorly researched. This study aims to determine the level of social capital and social support available to rural community dwellers in relation to their health needs and to explore the relationship which exists between social capital and socio-economic status of respondents.

Stratified random sampling technique was used to select 1280 respondents from 4 rural communities in South-West Nigeria (Ejigbo LGA). Data was obtained using an interviewer administered questionnaire in local dialect (Yoruba). Socio-economic status was determined using the Kuppuswamy’s method of Social Classification. Chi square was used to test associations between social capital and socio-economic status and level of significant association set at p<0.05.

Male and female respondents were 51.0% and 49.0% respectively within the age range of 15 and 90 years. Majority of the rural dwellers in Ejigbo community belong to the lower socio-economic status.

This study clearly revealed that rural dwellers have strong social support as well as large social capital to fall back on in times of crisis. Majority of the rural dwellers had family members, close relatives, friends, religious leaders and social group to fall back to when faced with health challenges/problems.

Though rural dwellers in Ejigbo community (South-West Nigeria) may have a strong social support and large social capital, it is not a reflection of socio-economic status of the community members.
KEYWORDS
Rural dwellers, Community members, Social capital, Social support, Sociologists, Rural community.

INTRODUCTION

BACKGROUND OF STUDY:

Social capital is the expected collective or economic benefits derived from the preferential treatment and cooperation between individuals and groups. The Main thrust of social capital is that social networks have value though access to social capital is still not universal and automatic. It is believed by sociologists that social contacts affect the productivity of individuals and groups.

Social Capital in communities may mediate the relationship between income inequality and health status (Kawachi et al., 1997). Social capital is a concept that captures both a buffer function of the social environment on health, as well as potential effects arising from social inequality and exclusion (Uphoff et. al., 2013). The relevance of social capital in low income settings is tied to its enablement of collective actions that support day to day living especially for socially disadvantaged persons such as the poor, women or ethnic minorities (Fox and Gershan 2000; Aye et al, 2002).

Social capital is significant because it affects rural people’s capacity to organize for development. According to Uphoff 1986, social capital helps groups to perform the following key development tasks effectively and efficiently: Plan and evaluate – make decisions; Mobilize resources and manage them; Communicate with each other and coordinate their activities and Resolve conflicts. These four tasks must be done in order to sustain individual and community well-being. (Cited by the World Bank, 2011)

Though it has been established that social capital is of value, the relationship which exist between the socio-economic status of rural communities and the social capital of community members has been poorly studied, hence the need for this study.

STUDY OBJECTIVES

The broad objective of this study is to determine the relationship between Socio-economic status of community members and their social capital.

THE SPECIFIC OBJECTIVES OF THIS STUDY ARE:

1. Determine the level of social capital and social support available to community members
2. Determine the socio-economic status of rural community members

3. Explore the relationship between the socio-economic status of community members and their social capital

**RESEARCH QUESTIONS**

1. What level of social capital and social support is available to community members?
2. What is the socio-economic status of community members
3. What relationship exists between the socio-economic level of rural community members and their level of social capital?

**METHODOLOGY**

**SURVEY DESIGN:** A cross sectional study which utilized validated interviewer-administered questionnaire.

**LOCATION:** This survey took place in 4 randomly selected communities with high volume of population density and in close proximity to healthcare service centre.

**SAMPLING TECHNIQUE:** Stratified random sampling technique was used to select the 4 communities. A list of all the communities near the health facility was drawn out of which communities with high volume was selected from amongst the list. The 4 with the highest population was then selected for this study.

**INCLUSION CRITERIA/POPULATION OF INTEREST:** Community members above 18 years and resident in selected community who are willing to be interviewed were all included in this study.

**EXCLUSION CRITERIA:** Respondents below 18 years of age and others who are unwilling to participate in the study were excluded and were not interviewed.

**INSTRUMENT:** Interviewer administered questionnaire with structured and unstructured questions with various sections relating to socio-economic status and social capital/social support was used to obtain data for the purpose of analysis and drawing conclusions.

**DATA COLLECTION PROCEDURES:** The questionnaire was reviewed first with the interviewer, followed by mapping of the community and systematic random sampling of areas where respondents were located. The data was obtained from respondents by interviewer-administered questionnaire by trained field-research assistants.
METHOD OF DATA ANALYSIS: Socio-economic status was scaled from the cumulative computations of scores assigned to level of education, income/Earnings and occupation using the Kuppuswamy’s method of Social Classification. Socio-economic status was scaled from the cumulative computations of scores assigned to level of education, Income/Earnings and occupation. Kuppuswamy’s method of Social Classification of an Individual was employed in determining the Socio-economic status (SES) of individual respondents. Educational level was classified into 8 different classes which include: None, Primary, Junior Secondary, Senior Secondary, Post Secondary, Diploma/NCE, Graduate/HND/NYSC, Post graduate. The Occupations were grouped into 7 categories namely Unemployed, Un-skilled worker, semi skilled worker, skilled worker, clerical/shop owners/trader/farm owner, semi profession/junior civil servant, professional/senior civil servant. Income/earnings per month of the individual were classified in naira as below 10,000; 10,001 – 20,000; 20,001 – 40,000; 40,001 – 60,000; 60,001 – 100,000; above 100,000. Each category was given a score each. The total score for SES computation was equal to 20 points. Then, SES was classified into 5 classes namely: Lower SES (scores of 1-4), Upper lower SES (scores of 5-8), Lower middle SES (scores of 9-12), Upper Middle SES (scores of 13-16) and upper SES (17-20)(Edet-Utan, 2014).

Chi square was used to test associations between social capital and socio-economic status and level of significant association set at p<0.05.

ETHICAL CONSIDERATIONS: This survey shall be of no known harm to the respondents. Only willing persons shall be interviewed with no undue coercion or duress. Consent will be obtained before interviewing respondents and they will be treated with dignity and respect. Confidentiality of all information obtained would be assured and maintained throughout.

RESULTS

A total of 1280 respondents were interviewed with completed questionnaire with 51.0% and 49.0% males and females respectively within the age range of 15 and 90 years. The table below shows the responses of rural community dwellers to specific questions posed in the study with regards to their perceived social support as well as social capital available to them.
Table 1. Perceived Social support/capital of respondents

<table>
<thead>
<tr>
<th></th>
<th>Perceived Social Support</th>
<th>Response categories</th>
<th>Significant difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responses to statements on Social Support</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>A</td>
<td>I have relatives that would at moment’s notice provide me financial assistance to deal with health costs.</td>
<td>568 (44.4%)</td>
<td>712 (55.7%)</td>
</tr>
<tr>
<td>B</td>
<td>My relatives are not always willing to give me financial help when I ask for it.</td>
<td>637 (49.8%)</td>
<td>643 (50.2%)</td>
</tr>
<tr>
<td>C</td>
<td>When I run into difficulties with issues of life;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Religious leaders find useful solutions that are helpful.</td>
<td>581 (45.4%)</td>
<td>689 (54.7%)</td>
</tr>
<tr>
<td></td>
<td>(b) Trade groups do not help me at all,</td>
<td>772 (60.3%)</td>
<td>508 (39.7%)</td>
</tr>
<tr>
<td></td>
<td>(c) There's no social support groups to turn to</td>
<td>643 (50.3%)</td>
<td>637 (49.8%)</td>
</tr>
<tr>
<td>D</td>
<td>Social group in the community.</td>
<td>418 (32.7%)</td>
<td>861 (67.3%)</td>
</tr>
<tr>
<td>E</td>
<td>Hospitals and clinics are for the rich alone.</td>
<td>1093 (85.5%)</td>
<td>187 (14.6%)</td>
</tr>
<tr>
<td>2</td>
<td>Perceived Social Capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>I have close friends I can share intimate information about myself.</td>
<td>249 (19.5%)</td>
<td>1031 (80.5%)</td>
</tr>
<tr>
<td>B</td>
<td>I am very close to community leaders that I can trust to provide me assistance when I need it.</td>
<td>809 (63.2%)</td>
<td>471 (36.8%)</td>
</tr>
<tr>
<td>C</td>
<td>My very close friends come from other parts of the country.</td>
<td>755 (59.0%)</td>
<td>525 (41.0%)</td>
</tr>
<tr>
<td>D</td>
<td>I trust healthcare providers with intimate matters about my life.</td>
<td>209 (16.3%)</td>
<td>1071 (83.8%)</td>
</tr>
<tr>
<td>E</td>
<td>I am not at all worried that I have no body to bear my burdens when it occurs.</td>
<td>641 (50.1%)</td>
<td>639 (49.9%)</td>
</tr>
</tbody>
</table>
*Observed difference is statistically significant at p<0.05

Table above showed that respondents agreed to the fact that they receive a strong social support from immediate family members, friends, religious leaders, community leaders. Responses were assessed on a likert scale: Strongly Agree, Agree, Disagree and Strongly disagree. However for ease of analysis of significant difference between responses, responses have been collapsed into Agree and disagree. Respondents (55.7%; p<0.05) agreed that they have relatives that would at moment’s notice provide them financial assistance to deal with health costs. Difference in responses to the question regarding willingness of relatives to give them financial help when they ask for it was not statistically different. Many (54.7%; p<0.05) agreed that religious leaders find useful solutions that are helpful when they run into difficulties with issues of life. Although, many (60.3%; p<0.05) disagree that trade union do not help them, there is no statistically significant difference in their responses regarding availability of social support groups which they can turn to for help. Even though specific examples were not elicited from respondents, majority (67.3%; p<0.05) agreed that there are social groups in the community. Most respondents (80.5%; p<0.05) confirmed that they have close friends with whom they share intimate information about themselves. Many (63.3%; p<0.05) of the respondents reported that they are not very close to community leaders that they can trust to provide assistance in times of crisis.

**Perceived social capital and social support available to rural community dwellers (Chart 1a and b)**

Responses of rural dwellers with regards to perceived social support and capital were scaled and latter transformed into weak (0 – 15), average (16 – 31) and strong (32 – 48) social capital using SPSS version 21 on the highest scale of 48.

Summarily, many (79.0%) respondents agreed that strong social supports are available to them in their community. Also, 76.0% reported to large perceived social capital.
The findings of this study build on an earlier study (Edet-Utan, 2014). Chart above showed that majority of rural dwellers (respondents) belonged to the lower socio-economic status. Further analysis reveals that these group of people mostly belonged to the upper lower class (68.0%). Only 0.3% of this population belong to the upper socio-economic class. The relationship between the socio-economic status of community members and their social capital

Findings from this study after subjecting the null hypothesis to a chi square statistic test showed that no association exist between socio-economic status of rural dwellers and the amount of social support available to them ($X^2 = 5.43; \ p = 0.86; \ df = 8; \ n=1280$). Also no significant association was found between socio-economic status of rural dwellers and their social capital using the chi square test ($X^2 = 18.02; \ p = 0.26; \ df = ; \ n=1280$). Cluster bar charts below further explain this non-existent relationship between socio-economic status of rural dwellers and the amount of social support and capital available to them.
DISCUSSION

Majority of the rural dwellers in Ejigbo community belong to the lower socio-economic status. This study clearly revealed that rural dwellers have strong social support as well as large social capital to fall back on in times of crisis. Majority of the rural dwellers had family members, close relatives, friends, religious leaders and social group to fall back to when faced with health challenges/problems. Many sociologists have concluded that large social capital and strong social support is characteristic of rural dwellers, though they may be poor. This study however
supports the fact that rural communities depend on social capital to manage risk (this is including health risks).

Findings from this study also reflect that social capital does not have any significant relationship with socio-economic status of rural communities. Arguably, it would have been expected that large social capital and stronger social support would lead to increased socio-economic status of community members. According to Fran Baum’s submission, while social capital should not be seen as a panacea for socio-economic hardship, social capital (networks, trust and co-operation) are also not substitutes for housing, jobs, incomes and education even though they might play a role in helping people gain access to these things (Fran Baum, 1999).

SECTION TWO: LEVEL OF SOCIAL SUPPORT AND CAPITAL

This section seeks to ascertain how much your relatives, friends and colleagues in the community provide tangible support and information about issues that challenge your quality of life and enable you to cope well during adversities.

**SD = Strongly Disagree, D = Disagree, A = Agree and SA = Strongly Agree.**

<table>
<thead>
<tr>
<th>1</th>
<th>Perceived Social Support</th>
<th>Response categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD</td>
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<table>
<thead>
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</tr>
</tbody>
</table>
CONCLUSION

Many rural community dwellers in Ejigbo, Nigeria, belong to the low socio-economic status. Though rural dwellers in Ejigbo community (South-West Nigeria) may have a strong social support and large social capital, it is not a reflection of socio-economic status of the community members.

REFERENCES


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FACTORS AFFECTING UTILIZATION OF POSTNATAL CARE SERVICES IN KENYA

A Case Study By Mr. Peter Muturi Kinuthia, Kenya.

(MPH Student of Texila American University)
Email: polorien@gmail.com

ABSTRACT

Approximately 30-40% of direct maternal deaths in Africa are due to hemorrhage, mostly in the postpartum period both in the hospital and in the community levels. In sub-Saharan Africa only 13% of the mothers attend postnatal care. Adequate utilization of postnatal care can help reduce mortality and morbidity among mothers and their babies. This study was carried out in Province General Hospital Nyeri, Kenya with the objective of determining the factors affecting the utilization of postnatal services. It was a descriptive survey and convenience sampling method was used to identify the required sample population and a data was analyzed using descriptive statistics. A total of 240 women successfully completed the survey. The questionnaire generated demographic information about the mothers’ knowledge about postnatal services, awareness and demographic characteristics that were found to influence the uptake of postnatal services included age, marital status, and parity.

It was found that most women lacked awareness about the services given in postnatal clinic and long waiting time and cultural beliefs were among factors that affected utilization of postnatal care. From the study the utilization of the postnatal services at the hospital in 14.2% which is quite low considering the need for postnatal services. The research recommends enhanced advocacy and communication to the mothers on the need for use of postnatal services in the hospital.

KEYWORDS

Postnatal care, Provincial General Hospital Nyeri Kenya, Maternal mortality, Parity, Postpartum period
INTRODUCTION

BACKGROUND TO THE STUDY

Approximately 30-40% of direct maternal deaths in Africa are due to hemorrhage, mostly in the postpartum period (Lancet, 2006). The postpartum period in Africa is often marked by cultural practices. Many communities throughout Africa observe practices that keep mothers and babies indoors for the first month after birth—a period of seclusion. If a mother becomes ill during this period of seclusion, seeking formal health care is often delayed (Charlotte et al., 2008).

Postnatal care is the care given just after delivery and through six weeks of life and is recognized as a critical time for both mother and the baby. Postnatal care is one of the most important maternal health-care services for not only prevention of complications of impairment and disabilities but also reduction of maternal mortality. Postnatal care services enable the health professionals to identify post delivery problems, including potential complications and prompt treatments as well as promoting health of the mother and baby (WHO, 2006). Postnatal care seeks to improve maternal, newborn and infant receiving essential postpartum, newborn care and family planning services (WHO, 2006).

According to WHO (2006) the elements of postnatal care are *inter alia*; prevention of complication of the mother and baby including vertical transmission of diseases from mother to baby, early detection and treatment of problems and complication readiness, provision of care to mother and baby by skilled attendant, assisting the mother and her family to evaluate and develop personalized postnatal care plan, counseling for HIV and testing, counseling for contraception (birth spacing) and resumption of sexual activity, health promotion using health messages and counseling, referral of mother and baby for special care when necessary (WHO, 2006).

World Health Organization (WHO, 2008) defines focused postnatal care as a four schedule personalized care given to a woman immediately after delivery, within 48 hours, two weeks and six weeks. Postnatal care is a key strategy for reducing maternal mortality though millions of women in developing countries do not receive it. The findings by the WHO, UNICEF and UNFPA, show that a woman living in sub-Saharan Africa has 1 out of 6 chances of dying in pregnancy, childbirth and after delivery.

According to WHO (2004) the majors factors which prevent women in developing countries from accessing postnatal care which include; distance from the health facilities, cost related problems such as direct fees and the cost of transportation, drugs and supplies, multiple demands on women’s time, lack of power in decision making within the family and poor quality of services including poor handling by health providers (WHO, 2004: Safe motherhood).
KENYA

According to the Kenya Demographic Health Survey (KDHS) the postnatal situation in Kenya is not better either. The report shows that, only 7% attended postnatal care within two days after birth, 27% within three to six weeks and 5% within six weeks. For instance, in central province 44.2% didn’t attend postnatal care, 0.4% attended within 3-6 days and 4.3% within six weeks (KDHS 2008/2009). There is therefore need for awareness creation among women to attend and utilize the postnatal care services offered in health facilities in Kenya.

PROVINCIAL GENERAL HOSPITAL NYERI

There are a number of reproductive services offered in Province General hospital, in Maternal and Child Health/ Family planning (MCH/FP) department which include; Antenatal care, delivery, Family planning, immunization, cervical cancer screening, HIV counseling and testing, postnatal care, health education among others. A review done in 2010 showed that a total of 5400 attended Antenatal clinic and only 270 (5%) attended postnatal clinic (2010 Provincial General Hospital, Nyeri report).

This study therefore intended to investigate the factors affecting utilization of postnatal care services at the Provincial General Hospital, Nyeri, Kenya.

STATEMENT OF THE PROBLEM

The Kenya Demographic Health Survey (KDHS) report 2008/2009 indicates that the Maternal Mortality Ratio (MMR) remains high an average of 488/100 000. The proportion of mothers attending antenatal care at least once stood at 91.5%, deliveries by skilled attendants (42%), institutional deliveries (43.6%) and only 5% attended postnatal care and 81% of those who delivered outside health facility never get any postnatal services attention (KDHS, 2008/09).

The postpartum period constitutes an important transitional period necessary for maternal health among women who have just delivered. There is a definite need to understand the determinants of postnatal care services. A Study done in other parts of the country (Mbeere District) on utilization of antenatal services and maternal services (Mwaniki, 2002) reported that 93% attended antenatal care but only 10% attended postnatal care, distance from the facilities is reported to affect utilization of the services.

Most studies done in Kenya on postnatal care focused on newborn care with no attention to maternal care. For instance, studies done in Nairobi and Machakos (Mwangangi & Muindi, 2003) concentrated only on resources as factors influencing postnatal care. The study reported that only 8% attended postnatal care services owing to the problem of resources that is human resources, equipments and supplies in the health facilities. Utilization of postnatal care services...
in Kenya has taken a declining trend over the years. The 2008/2009 KDHS indicated that only 7% of women attended postnatal care services, while in Province General hospital, Nyeri only 5% attended postnatal in year 2010. This study sought to expand further on other factors affecting utilization of postnatal care services at the Provincial General Hospital, Nyeri, Kenya.

**PURPOSE OF THE STUDY**

The purpose of the study was to establish the factors affecting utilization of postnatal care services at Provincial General Hospital, Nyeri and suggest ways of improving the situation at the health facility.

**OBJECTIVE**

The objectives study was “To identify factors affecting the utilization of Postnatal care services in Nyeri Provincial Hospital”.

**RESEARCH QUESTIONS**

1. To what extent does the level of woman’s education influence utilization of postnatal care service in the hospital?
2. In what ways does woman’s marital status influence utilization of postnatal care services in the hospital?
3. How does woman’s parity influence utilization of postnatal care services in the hospital?
4. Does an increase in awareness about postnatal care services increase utilization of the services in hospital?
5. How does woman’s age influence utilization of postnatal care services in the hospital?
6. To what extent does distance from facility influence utilization of postnatal care services in the hospital?
7. Are there barriers to that impede utilization of postnatal care services in the hospital?

**SIGNIFICANCE OF THE STUDY**

Approximately 30-40%of direct maternal deaths in Africa are due to hemorrhage, mostly in the postpartum period (WHO, 2006). Such problems can be detected and treated through proper
follow up visits for women during the postpartum period. About 75% of maternal deaths occur during the process of childbirth or in the first week thereafter (WHO, 2007). The millennium development goal of reducing the maternal mortality ration by 75% by 2015 will remain beyond our reach unless the problem of postpartum is confronted as a priority. The level of utilization of postnatal care services is an important maternal health indicator. In using the findings of this study, health care providers will be able to understand why women are not utilizing postnatal care services. The study serves as an insight for the modification of plans and policies for future development regarding postnatal care. The study shall also add to the body of knowledge in the field of maternal health.

LIMITATIONS OF THE STUDY

Due to time and financial resources constrains the study was confined to Provincial General Hospital, Nyeri. It’s anticipated that some clients may hold back some information which they may regard sensitive. The researcher assured the respondents of strict confidentiality for any information given and that such information was for the purpose of the study only.

DELIMITATIONS

The researcher limited the study to awareness and factors affecting utilization of postnatal care services in Province General Hospital, Nyeri, Kenya in Maternal Child Health/Family Planning (MCH/FP) department. The MCH/FP department offers reproductive health services to women of reproductive age 15-49 years. The researcher conducted study in the department because postnatal care services were offered in the department.

ASSUMPTIONS OF THE STUDY

The study assumed that the respondents provided reliable and valid data that was useful in making conclusions in relation to the study.

Definition of significant terms as used in the study.

Postnatal care: is the assistance given to a mother immediately after birth for a period of six weeks to reduce complications and deaths as well as promote health.

Parity: number of children a woman has delivered

Postpartum period: starts after expulsion of placenta up to 42 days (6 weeks)
**Focused postnatal care:** - personalized assessment after birth up to 6 weeks. It has 4 scheduled visits: immediately after birth, within 48 hours, within 2 weeks and at 6 weeks.

**Postnatal services:** it comprises of care given to women after birth and includes: physical examination, immunization, family planning, health education on mother and baby care, treatment and counseling services.

**Maternal health:** refers to the well being of a mother during pregnancy and after birth.

**Maternal mortality:** -is death of a woman while pregnant or within 42 days of termination of the pregnancy irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by pregnancy and its complications but not from accidental or incidental causes (WHO, 2006).

**Maternal Mortality Ratio (MMR):** -number of maternal deaths during a given time period per 100 000 live births during the same time-period.

**Utilization of services:** -use of postnatal services by women after delivery of their babies.

**Barriers to utilization:** -in this study referred to what prevent women from utilizing postnatal care services.

**Awareness:** -having knowledge of or understanding of postnatal care services.

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**LITERATURE REVIEW**

**INTRODUCTION**

This chapter aims to present a critical review of the literature on determinants of postnatal care utilization. Relevant studies in both developing and developed countries were reviewed with particular emphasizes on the findings and methodological issues in developing countries.

Previous studies on maternal health examined either factors influencing use of health services for example study done in Kenya, Machakos and Nairobi (Mwangangi & Muindi 2003), investigated only on availability of supplies while others have investigated the causes of and level of maternal mortality. In the study the researcher sought to investigate factors affecting utilization of postnatal care services.

**POSTPARTUM PERIOD**

The postpartum period is one of the most vulnerable times in a woman’s reproductive life cycle. In developing countries, over 60% maternal deaths occur during this time. Approximately 30-40% of maternal deaths in Africa are due to hemorrhage, mostly in the postpartum period.

Report from central province in Kenya that is midyear 2010/2011 showed that maternal mortality has increased with most death occurring in the first 24 hours (60%) after delivery and 27%
between 24 hours to 2 weeks. This is the period when there is low utilization of postpartum care (central province maternal death report 2010/2011).

According to WHO (2007) an estimated 70% of women in sub-Saharan Africa do not receive postpartum care. Approximately 45% of maternal deaths occur within first 24 hours of delivery and another 23% occur on 2-7 days. Four visits postpartum care visits are recommended for the health and well being of mother and newborn (WHO, 2007).

**POSTNATAL CARE**

Postnatal care Focused Postnatal Care (FPNC) is globally accepted as a key to improved maternal health and reduced mortality.

WHO recommends integrated postnatal care that includes; prevention of complication of mother and baby including vertical transmission of diseases from mother to baby, early detection and treatment of problems and complication readiness, provision of care to mother and baby by skilled attendant, assist the mother and her family to evaluate, develop personalized postnatal care plan, counseling for HIV and testing, counseling for contraception (birth spacing) and resumption of sexual activity, health promotion using health messages and counseling, referral of mother and baby for special care when necessary (WHO, 2006).

**MATERNAL AGE**

Since older and younger women have different experience and influence, their behavior on seeking postnatal care also vary, commonly, younger women are more likely to utilize modern health facilities than older women as they are likely to have greater exposure and knowledge to modern health care and also access to education.

**WOMEN’S LEVEL OF AWARENESS**

Existing research on health outcome in developing countries has shown the important role of the media in disseminating information on health related issues.

**WOMEN’S AUTONOMY**

Autonomy has been defined as the capacity to manipulate one’s personal environment through control over resources and information in order to make decisions about one’s own concern or about close family members.

**BARRIERS TO UTILIZATION OF POSTNATAL CARE**

Study done on utilization of postnatal care in Al-Hassa, Saudi Arabia reported that lack of awareness is the main barrier to the utilization of postnatal care (Abdul, 2008). Another study done in Uganda on utilization of postnatal care reported that the main reason for non-utilization of postnatal care is lack of awareness or not perceiving a need for it (Annet, 2004).

**CONCEPTUAL FRAMEWORK**

There are various health seeking behavior and health utilization frameworks that can be useful in analyzing factors affecting utilization of maternal health services.
Figure 2.3: The conceptual Framework

**Independent variables**
- Woman’s education level
  - None
  - Primary
  - Secondary
  - College
- Marital status
  - Married
  - Single
- Parity (No. of children)
  - 1
  - 2
  - 3-4
  - More than 4
- Woman’s awareness level
  - Source of information
    (Newspaper, radio, television, Health Facility)
- Age of the Woman (years)
  - Below 20
  - 21-30
  - 31-40
  - 41-50
  - Above 50
- Distance from hospital
  - Below 5 km
  - 5 – 10 km
  - 10 – 15 km
  - Above 15 km
- Barriers to postnatal care
  - Decisions care seeking
  - Cultural factors
  - Satisfaction with services
  - Perceived quality of care

**Intervening variables**

**ATTITUDE**
- Willingness
- Perception

**SOCIAL INFLUENCE**
- Values
- Culture

**AUTONOMY**
- Leverage
- Power to make decision

**Dependent variable**
- Utilization of postnatal care
  - Number that attend in a month
In the conceptual model, the behavior such as the choice of delivery is considered to be the result of behavior intention. Three main psycho-social factors have been identified that predict behavior intention: attitude, social influence and self-efficacy. External sources like social, demographic and economic variables are expected to influence behavior through behavioral determinants and intentions (Amooti-Kaguna & Nuwaha, 2000).

The purpose of the model is to discover the predisposing characteristics, enabling resources and other conditions that either facilitate or impede utilization of maternal health services and in particular postnatal care services.

THE RELATIONSHIP BETWEEN THE VARIABLES
Postnatal care was conceptualized for the purpose of this study as the dependent variable education, marital status, parity, awareness, age and distance are the independent variables.

MATERNAL EDUCATION
This variable measures the level of education the individual has attained. At an individual level woman’s education is one of the most important factor.

MATERNAL MARITAL STATUS
The variable could be a contributing factor in the utilization of postnatal care services and may influence decision making on seeking care.

PARITY (NUMBER OF CHILDREN)
This variable will indicate if the number of children a woman has plays an important role in deciding about the utilization of postnatal care services.

AWARENESS LEVEL
This variable measures women’s exposure to information like radios, which can increase knowledge and awareness in utilization of postnatal care services.

MATERNAL AGE
Age of the respondent is represented by a continuous variable ranging from 15 to 49 years old. The age could be a contributing factor in the utilization of postnatal care services.

DISTANCE
This variable indicated the distance from facility in kilometers. The distance from facility matters in utilization of postnatal care services

SUMMARY OF LITERATURE REVIEW
From the review, postnatal care is a key strategy for reducing maternal mortality, but millions women in developing countries do not receive it. The main reason identified for the non-utilization of postnatal care is lack of awareness, cultural beliefs among others. Most maternal deaths occur during postpartum period and these deaths can be prevented if postnatal care services are utilized in health facilities. A conceptual framework with independent, intervening
and dependent variables was diagrammatically presented and a brief explanation on the variables was done.

RESEARCH METHODOLOGY

INTRODUCTION
This chapter describes the study area and materials and methods that were used in conducting the study. The materials and methods discussed included; study design, study population, sampling design and sample size determination, data collection instruments, method of data collection, the study variables, validation of tools, ethical considerations and lastly data management, analysis, dissemination and utilization.

RESEARCH DESIGN
The study used descriptive survey design. A descriptive survey design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. This design was ideal for this study since it is most suitable as the researcher was intending to gain immediate knowledge and information on factors affecting utilization of postnatal care services as they existed on the ground and also was economical on both time and funds.

To achieve the aim of the study, both qualitative and quantitative research approaches of data collection methods, analysis presentations was used. Both methods reduced biasness as they checked the quality of each analysis. Qualitative research seeks to describe and analyze the culture and behavior of humans and their group from the point of view of those being studied. For this study questionnaires was used as instruments of data collection.

TARGET POPULATION
In the study, postnatal women visiting the Maternal Child Health (MCH) at Province General Hospital Nyeri were targeted. Women who met the inclusion criteria were included in the study, that is, all the women within postnatal period, the mothers whose children were less than six months and those who gave consent. All the mothers who visited for other reasons, mothers with children above 6 months or those that declined were excluded.

Sample size
In the study the sample size was 240 mothers based on the 30% rule.

Sampling Technique
From the clinic estimates the average number of mothers attending child welfare clinic per day are 40. Convenience sampling was used in the study because mothers come to the facility at different time intervals. Convenience sampling is a non probability sampling which involved the sample being drawn from that part of the population which is close to hand.
Research Instruments
In this study, data was collected using questionnaires in English language but translated during interview to local kikuyu or Swahili language depending on the respondent’s preferred language. The purpose of the study was explained to all the eligible respondents. Upon accepting to participate in the study, they were required to give verbal/written informed consent.

Data Analysis Technique
The collected data in form of the questionnaires was cleaned, coded and entered into the computer using the Microsoft excels. Data information findings was presented in qualitative form.

Ethical Issues in Research
Confidentiality was maintained throughout the short study. No participant’s name was used subsequently in the report derived from the study. In order to carry out this study, approval was sought from Provincial General Hospital management and Nyeri Institutional Research Medical board. Participation in the study was purely voluntary.

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

Introduction
In this chapter the results of the study are described and the analysis of the data presented. The demographic predictors used in this study were age, education, marital status and parity. The outcome (dependent variable) was postnatal care service utilization. Data analysis was done using descriptive statistics. Comparisons of responses and chi-square analysis to establish whether there was any relationship between independent variables and utilization of postnatal care services was done using the statistical package for social sciences (SPSS) version 17 of analysis. The findings were presented in narrative, tables, charts and graphs as per the specific objectives. Out of the grand total of 240 questionnaires which were used in the study, all of them were filled; hence a response rate of 100%.

Demographic factors
In order to assess the demographic factors that determine the utilization of postnatal care services among postpartum women attending Central Province General Hospital, Nyeri, age, education, marital status, distance from the health facility and number of children were used as the demographic predictors in this study. Table 4.1 shows that majority of the respondents 74.2% were between 21-30 years of age, 17.9% in the 31-40 age group, 6.3% below 20 years and only 1.7% were in the age group of 41-50 years.
Table 4.1 distribution of respondents by age

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>15</td>
<td>6.3</td>
</tr>
<tr>
<td>21-30</td>
<td>178</td>
<td>74.2</td>
</tr>
<tr>
<td>31-40</td>
<td>43</td>
<td>17.9</td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As shown in Table 4.2, a significant majority 47.1% of the respondents had attained secondary education, 40.8% primary education while only 12.1% had tertiary education.

Table 4.2 distribution of respondents by education level

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>98</td>
<td>40.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>113</td>
<td>47.1</td>
</tr>
<tr>
<td>Tertiary</td>
<td>29</td>
<td>12.1</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

On marital status, majority of the respondents 80.8% were married while those who were single was 17.9% and only a small proportion 1.3% were separated as shown in Table 4.3.

Table 4.3 distribution of respondent by marital status

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>194</td>
<td>80.8</td>
</tr>
<tr>
<td>Single</td>
<td>43</td>
<td>17.9</td>
</tr>
<tr>
<td>Separated</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Majority of respondents 63.8% resided within a distance of 0-5km from the hospital, 21.3% a distance of 5-10km, and 9.2% travelled a distance of more than 15km to the hospital and only 5.8% resided 10-15km from the hospital as shown in Table 4.4.

Table 4.4 Distance of respondents’ residence from the hospital

<table>
<thead>
<tr>
<th>Distance in kilometers</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>153</td>
<td>63.8</td>
</tr>
<tr>
<td>5-10</td>
<td>51</td>
<td>21.3</td>
</tr>
<tr>
<td>10-15</td>
<td>14</td>
<td>5.8</td>
</tr>
<tr>
<td>&gt;15</td>
<td>22</td>
<td>9.2</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Of all the study participants, 49.6% had 2-3 children, 44.2% had 1 child, 3.8% had 4-5 children and only 2.5% had more than 5 children as shown in Table 4.5.

Table 4.5 distribution of respondents by number of children

<table>
<thead>
<tr>
<th>No. of Children</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>106</td>
<td>44.2</td>
</tr>
<tr>
<td>2-3</td>
<td>119</td>
<td>49.6</td>
</tr>
<tr>
<td>4-5</td>
<td>9</td>
<td>3.8</td>
</tr>
<tr>
<td>&gt;5</td>
<td>6</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Utilization of postnatal care services

This section presents information about utilization of postnatal care services in Maternal Child Health (MCH) clinic at the Central Province General Hospital, Nyeri. Variables addressed included mothers’ attendance and non attendance of postnatal care services and the factors that affect the utilization of the postnatal services.

Table 4.6 shows the attendance and non attendance of postnatal care services. The results shows that majority of the respondents 85.8% did not attend postnatal care services whilst only a minority 14.2% presented themselves for the postnatal care services.

Table 4.6 whether respondents attended postnatal services or not

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>34</td>
<td>14.2</td>
</tr>
<tr>
<td>No</td>
<td>206</td>
<td>85.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Reasons for attending postnatal services

Mothers provided various reasons for attending postnatal care services as depicted in Table 4.7. The results show that majority of the respondents 38.2% attended the clinic for immunization services for the child, 32.4% attended the clinic to seek treatment for self or child and only 26.5% attended the clinic for comprehensive postnatal care services.

Table 4.7 Distribution of respondents by reasons for clinic attendance

<table>
<thead>
<tr>
<th>Service</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>To seek for treatment</td>
<td>11</td>
<td>32.4</td>
</tr>
<tr>
<td>Child’s immunization</td>
<td>13</td>
<td>38.2</td>
</tr>
<tr>
<td>Family planning</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Check up for both mother and baby</td>
<td>9</td>
<td>26.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Reasons for not attending postnatal care

In Figure 4.1, respondents provided various reasons for not attending postnatal care services. Majority of the mothers 49.5% reported that they found it not necessary, 44.4% said that they did not attend postnatal care services because they had no problem whilst 6.3% reported that they were not aware of the postnatal services.

![Reasons for not attending postnatal care](image)

**Figure 4.1 Reasons for not attending postnatal care**

Comparison of age and postnatal care attendance

Majority of respondents who were 66.7% in below 20 years of age did not attend PNC while 33.3% did. Of those in the age 21 to 30 years, 86.0% did not attend, 90.7% of those in age 31 to 40 years did not attend clinic while none of those in the age 41 to 50 years attended the clinic. Clinic attendance was associated with age of client which was of statistical significant (p=0.034) as shown in Table 4.8 as determined by Pearson chi-square test greater than 5 and P-value less than 0.05.

Table 4.8 Comparison of age against postnatal care attendance

<table>
<thead>
<tr>
<th>Respondent’s age versus whether she attended PNC in first two wks after delivery</th>
<th>Did you attend PNC in first two wks after delivery?</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Freq</td>
<td>%</td>
<td>Yes</td>
<td>Freq</td>
</tr>
<tr>
<td>Age of the woman</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td></td>
<td>10</td>
<td>66.7</td>
<td>5</td>
<td>33.3</td>
</tr>
<tr>
<td>21-30</td>
<td>153</td>
<td>86.0</td>
<td>25</td>
<td>14.0</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>39</td>
<td>90.7</td>
<td>4</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>100.0</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 8.684, \text{ df} = 3, \text{ p}=0.034 \]
Respondent’s age versus whether she attended PNC in first two wks after delivery

<table>
<thead>
<tr>
<th>Age of the woman</th>
<th>Did you attend PNC in first two wks after delivery?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Freq</td>
</tr>
<tr>
<td>&lt;20</td>
<td>10</td>
<td>66.7</td>
<td>5</td>
</tr>
<tr>
<td>21-30</td>
<td>153</td>
<td>86.0</td>
<td>25</td>
</tr>
<tr>
<td>31-40</td>
<td>39</td>
<td>90.7</td>
<td>4</td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>100.0</td>
<td>34</td>
</tr>
</tbody>
</table>

\( \chi^2 = 8.684, \quad df = 3, \quad p=0.034 \)

Comparison of marital status and postnatal care attendance

Table 4.9 shows a cross tabulation of postnatal care attendance status and marital status. The results show that single women were better at attending postnatal clinic compared to married women. Majority of married women 89.1% did not attend postnatal, 72.2% of single women did not attend postnatal services. Majority of single women attended postnatal services 27.7% whereas only 10.9% of married women attended postnatal which was statistically significant \((p=0.011)\) as determined by Pearson chi-square test and was considered statistically significant when less than 0.05.

Table 4.9 Marital status versus postnatal care attendance

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Did you attend PNC in first two wks after delivery?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Freq</td>
</tr>
<tr>
<td>Married</td>
<td>172</td>
<td>89.1</td>
<td>21</td>
</tr>
<tr>
<td>Single</td>
<td>32</td>
<td>72.7</td>
<td>12</td>
</tr>
<tr>
<td>Separated</td>
<td>3</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>100.0</td>
<td>34</td>
</tr>
</tbody>
</table>

\( \chi^2 = 9.052, \quad df = 2, \quad p=0.011 \)
Utilization of postnatal care services against distance to woman’s home

Of all the women who resided less than 5 kilometres from the hospital, 15.3% attended postnatal clinic in the first two weeks following delivery, 17.6% of those residing between 5 and 10 kilometres attended postnatal care while nearly all the mothers 92.9% who were 10-15 kilometres from the hospital did not attend postnatal care. All mothers living more than 15 kilometres from the hospital did not attend the postnatal care services within 2 weeks after delivery. Though apparently distance had an influence on postnatal care attendance, the same was not significant as shown in Table 4.10. The P-value was 0.076 which greater than 0.05 as determined by using Pearson chi-square test which was less than 5.

Table 4.10 Comparison of distance of woman's home from hospital and postnatal care attendance in first two weeks after delivery?

<table>
<thead>
<tr>
<th>Distance of woman's home from hospital</th>
<th>Attend PNC in first two weeks after delivery?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
</tr>
<tr>
<td>0-5</td>
<td>129</td>
<td>84.3</td>
<td>24</td>
</tr>
<tr>
<td>5-10</td>
<td>42</td>
<td>82.4</td>
<td>9</td>
</tr>
<tr>
<td>10-15</td>
<td>13</td>
<td>92.9</td>
<td>1</td>
</tr>
<tr>
<td>&gt;15</td>
<td>22</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>34</td>
<td>240</td>
</tr>
</tbody>
</table>

Comparison of the number of children a woman has and PNC attendance

The number of children woman an important role in deciding about the utilization of postnatal care services. This study demonstrates that with each additional birth, utilization level decreases. This can be associated with experience and exposure. This study showed an inverse relationship between the number of children a woman has and postnatal care services utilization. The more the children, the less likely the woman attends postnatal clinic, a relationship that was statistically significant (p=0.010) as shown in Table 4.11 and P- value determined using Pearson chi-square test and considered statistically significant when less than 0.05.
Table 4.11 Number of children and postnatal attendance

<table>
<thead>
<tr>
<th>Number of children the woman has</th>
<th>Did you attend PNC in first two wks after delivery?</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>88</td>
<td>83.0</td>
</tr>
<tr>
<td>2-3</td>
<td>103</td>
<td>86.6</td>
</tr>
<tr>
<td>4-5</td>
<td>6</td>
<td>100.0</td>
</tr>
<tr>
<td>&gt;5</td>
<td>3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>34</td>
</tr>
</tbody>
</table>

Education level and PNC attendance

The education level of the respondents ranged from primary to tertiary level. This study showed that education does not influence utilization of postnatal services for 96.6% of respondents with tertiary education did not utilize the postnatal while only 3.4% utilized the services. Majority of the respondents who utilized the postnatal care services 21.7% attained primary education as shown in Table 4.12. P=0.01

Table 4.12 Education versus postnatal attendance

<table>
<thead>
<tr>
<th>Woman's level of education</th>
<th>Did you attend PNC in first two wks after delivery?</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Primary</td>
<td>76</td>
<td>78.3</td>
</tr>
<tr>
<td>Secondary</td>
<td>102</td>
<td>90.3</td>
</tr>
<tr>
<td>Tertiary</td>
<td>28</td>
<td>96.6</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>34</td>
</tr>
</tbody>
</table>
Respondents’ awareness of postnatal care services

Knowledge on Postnatal care services

Knowledge on postnatal care was assessed by use of four key parameters: Whether a respondent has ever heard of postnatal care services, whether she knew of the required services, number of postnatal services a woman should make and listing the postnatal care services. Each correct item had a score of 1 hence a possible total of 4 and minimum of 0. Those whose aggregate scores of 0 and 1 were categorised as having poor knowledge on postnatal care, those who scored 2 had inadequate knowledge, score 3 was good knowledge while score 4 was very good knowledge. The results further showed that majority of the respondents 33.3% had poor knowledge on postnatal services, 24.2% had inadequate knowledge, 22.9% had adequate knowledge whilst only 19.6% had very good knowledge on postnatal services as shown in Table 4.13.

Table 4.13: Postnatal knowledge scores

<table>
<thead>
<tr>
<th>Knowledge scores</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor knowledge</td>
<td>80</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Inadequate knowledge</td>
<td>58</td>
<td>24.2</td>
<td>57.5</td>
</tr>
<tr>
<td>Adequate knowledge</td>
<td>55</td>
<td>22.9</td>
<td>80.4</td>
</tr>
<tr>
<td>Very good knowledge</td>
<td>47</td>
<td>19.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Influence of PNC knowledge on postnatal care attendance

A total of 80 respondents had poor knowledge on postnatal care out of who only 7.5% utilized postnatal care services. Among those who had inadequate knowledge, 7% went for postnatal care, while among those with adequate knowledge, 16.3% went for postnatal care services. The best attendance 31.9%was reported among those who had very good knowledge on postnatal care and a general trend that the higher the knowledge scores, the better the postnatal care attendance as shown in Figure 4.2. Knowledge on postnatal care influenced utilization of postnatal care positively which was significant (p=0.014).
Health talks

Health talks are delivered at the MCH clinic as part of creating awareness to women on various health issues. Table 4.14 shows that though health talks were delivered, postnatal care services were not emphasized during Antenatal care. Majority of the respondents 78.8% reported that they received no health talks on postnatal care and only 21.5% reported that there were health talks on postnatal care.

Table 4.14 Distribution of respondents who received Health talk on PNC during ANC

<table>
<thead>
<tr>
<th>Received Health talk</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>51</td>
<td>21.3</td>
</tr>
<tr>
<td>No</td>
<td>189</td>
<td>78.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Barriers to utilization of postnatal care services

This section presents the factors that hindered mothers from utilizing postnatal care services. The variables include decision making, cultural factors, mothers’ grievances and comment about provision of care and service providers.
Decision making on seeking PNC services

As shown in Figure 4.3, a significant proportion of respondents 48.5% made the decision to seek postnatal care on their own about when to seek care while in 42.2%, both herself and partner make the decision on seeking care. A minority 7.1% and 2.1% respectively had the decision made for them by partner or other persons respectively.

Figure 4.3: Who makes decision on whether a woman seeks postnatal care

Any health problem preventing seeking PNC

A significant majority 87.1% reported that they had no health problem which hindered them from utilizing postnatal care whereas 12.1% reported that they experienced some problems which hindered them from utilizing postnatal services whilst 0.8% did not respond to this question. Among the reasons fronted were religious and family restrictions based on cultural believes that a woman should not leave the house for sometime after delivering as shown in Figure 4.4.
Health problems hindering postnatal care attendance
Out of the 29 respondents who had health problems that barred them from attending PNC, 44.8% had bleeding problems, 27.6% had baby’s umbilical cord problems, 13.8% reported that the respondent was sick and in 13.8%, the baby was sick as shown in Table 4.15. The health problems which barred them from attending postnatal care are the major causes of maternal deaths. This shows that women had no knowledge about danger signs during postpartum period.

<table>
<thead>
<tr>
<th>Health problem</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>13</td>
<td>44.8</td>
</tr>
<tr>
<td>Baby umbilical cord problems</td>
<td>8</td>
<td>27.6</td>
</tr>
<tr>
<td>Mother sick</td>
<td>4</td>
<td>13.8</td>
</tr>
<tr>
<td>Baby sick</td>
<td>4</td>
<td>13.8</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Whether respondents were happy with services
Results from Figure 4.5 showed that majority of participants 71.2% were happy with the services provided while 28.8% were not.
Figure 4.5: If respondents were happy or not with services offered
Among those respondents who were unhappy with services; as shown in Table 4.16, majority 65.2% said that the waiting time was too long, 7.2% said the health workers were not polite, 20.4% complained they were attended to by students who were not supervised while 7.2% said the clients were not strictly served on a first come first served basis and these were among the reasons that discouraged clients from seeking services.

Table 4.16 Reasons for being unhappy

<table>
<thead>
<tr>
<th>Reason for being unhappy</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long waiting time</td>
<td>45</td>
<td>65.2%</td>
</tr>
<tr>
<td>Impolite by health workers</td>
<td>5</td>
<td>7.2%</td>
</tr>
<tr>
<td>Attended to by student</td>
<td>14</td>
<td>20.4%</td>
</tr>
<tr>
<td>Clients not served on first come basis</td>
<td>5</td>
<td>7.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

*Reasons for being happy with services*
In Table 4.17; among the 171 respondents who were happy about the postnatal care services received, 41.5% reported they received good treatment, 21.1% were happy because health providers gave good family planning health education, 22.2% said they received good advice, 11.1% reported that the facility is very clean, 4.1% said there was good sitting arrangement.
Table 4.17 Respondents’ reason for being happy with the services

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanliness</td>
<td>19</td>
<td>11.1</td>
</tr>
<tr>
<td>Good family planning health</td>
<td>36</td>
<td>21.1</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good sitting</td>
<td>7</td>
<td>4.1</td>
</tr>
<tr>
<td>Good treatment</td>
<td>71</td>
<td>41.5</td>
</tr>
<tr>
<td>Good advice</td>
<td>38</td>
<td>22.2</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Suggestions for improvement of PNC services

Table 4.18 shows that majority 43.0% said that service providers should reduce on waiting time, 19.3% suggested that the government should employ more health workers, 12.3% said health providers to teach mothers on postnatal care, 9.6% said health workers should be polite to patients, 7.9% said that health workers need to introduce shift to attend clients on lunchtime and students should be supervised and not to be left to attend clients alone.

Table 4.18 Suggestions for improvement of the postnatal care services

<table>
<thead>
<tr>
<th>Suggestion</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce waiting time</td>
<td>49</td>
<td>43.0</td>
</tr>
<tr>
<td>Health workers need to be polite</td>
<td>11</td>
<td>9.6</td>
</tr>
<tr>
<td>Supervise students</td>
<td>9</td>
<td>7.9</td>
</tr>
<tr>
<td>Teach mothers on postnatal care</td>
<td>14</td>
<td>12.3</td>
</tr>
<tr>
<td>Employ more health workers</td>
<td>22</td>
<td>19.3</td>
</tr>
<tr>
<td>Introduce shift to see clients on lunchtime</td>
<td>9</td>
<td>7.9</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>100.0</td>
</tr>
</tbody>
</table>

SUMMARY

Cross tabulations and Pearson chi-square employed to determine which factors were significant regarding utilization of postnatal care services. The variables that were found to be significantly influencing postnatal services utilization include age of the respondent, marital status , number of children , education and the knowledge the women had on postnatal care. Long waiting time, impolite health workers, being attended to by unsupervised students were among the factors found to influence utilization of postnatal care services. Cultural beliefs such as maternal seclusion and religious beliefs also influenced utilization of postnatal. Good treatment, good
advice good family planning health education and clean facility influenced postnatal care utilization.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.

Introduction
This chapter discusses the summary of findings and presents a discussion of the study findings of the study that was aimed at establishing factors affecting utilization of postnatal care services. The study endeavored to find the association between demographic information, awareness and barriers with the utilization of postnatal care services.

Summary of findings.
There was a high response rate 100% (n=240). The demographic predictors used in this study were age, education, marital status, parity and distance from the facility. Other indicators included awareness and barriers influencing utilization of postnatal care services. This study shows that utilization of postnatal care services was low 14.2% in Central Province General, Nyeri.

In this study, majority of the respondents 54.3% were between 21-30 years and age was statistically significant (P=0.034) in utilization of postnatal care services. Younger women attended postnatal care service better while none of the respondents above age 41 years attended postnatal clinic. Maternal education did not influence utilization of postnatal care services. The more the children, the less likely the woman attends clinic, a finding which was statistically significant (P=0.010). Though apparently distance had an influence on postnatal care attendance, the same was not significant (P=0.076). Long waiting time, rudeness of health providers were among the factors found to affect utilization of postnatal care services. Poor knowledge about postnatal care and cultural beliefs had negative impact on utilization of postnatal care services.

Discussion of findings.
The study recorded a high response rate of 100% and according to Linder and Wingenbach (2002), surveys that have high response rates provide a measure of reassurance that the findings can be projected to the population from which the sample is drawn. The success of the high response rate (n=240) 100% can be attributed to the fact that the completion and return of the questionnaires was well supervised by trained research assistants.

This study documented a low utilization of postnatal care services at the Central Provincial General Hospital - Nyeri as only 14.2% of the respondents utilized postnatal care services which was almost equal to sub Saharan Africa where only 13% utilizes postnatal care services (Lancet, 2006). Numerous studies in developing countries have shown that demographic factors such as age, parity, education and distance are associated with the use of the postnatal care services (Sharma et al (2007); Wong et al., (1987); Obermeyer, 1993). It was well recognized that age plays an important role in women’s utilization of maternal health services. Since older and
younger women have different experience; and influence, their behavior on seeking postnatal also vary, younger women might have enhanced their knowledge of modern medicine and are more likely to utilize modern health facilities than older women. They are likely to have greater exposure and more access to education. One study done in Nepal (Sharma et al., 2007) gave result that women over 35 are less likely to utilize postnatal care services. In this study the pattern was similar 33.3% of those below 20 years utilized the services, 14 % of those below 30 years utilized the services 9.3 % above 30 years and none above 35 years utilized the services. The findings of this study support this observation for they showed that postnatal utilization had a strong statistical association with the age of women.

Maternal education has a positive impact on the utilization of health care services (Kogan & Leary, 1990, Chakrabotry et al., 2002). According to these authors, maternal education increases women’s perceived seriousness about maternal health issues. Studies conducted at Bangladesh (K.M. Mustafirzur Rahman (2009) showed that maternal education is strongly associated with postnatal care. The higher educated mothers are more conscious than illiterate mother in utilizing the services. The results from this study showed a different pattern of utilizing postnatal care services. Majority of the respondents with tertiary education did not utilize the services. Education did not directly influence utilization of postnatal care services.

The number of children woman has plays an important role in deciding about the utilization of postnatal care services. Study done at Nepal Shamar et al., (2007) revealed that women with higher birth order utilized postnatal care to lesser extent than those with one child. With respect to birth order, this study showed that with each additional birth, utilization level decreases. The decline in postnatal care services among higher birth had also been shown in a study done at Mbeere District, Kenya (Mwaniki, 2002) which agrees with the results of this study as women with higher birth more than five none attended postnatal care which could be associated with experience and exposure.

Distance limits women’s willingness to seek healthcare services particularly when appropriate transportation is scarce and communication difficult (Timyan et al., 1999). In this study 15.3% of the respondents who lived 0-5km from the hospital attended postnatal services whilst no respondents more than 15km from the facility attended postnatal care. This can be explained due to the fact that accessibility and affordability to the health facility was more difficult.

Decision to seek healthcare services can be made by the woman herself, husband and other family members (Timyan et al., 1993). In this study single women were better at attending postnatal care services compared to married women. Previous studies indicated that men believe maternal health care services are woman’s affairs. The answer lies in involving men in maternal health issues and this may increase utilization of services by married women.

Women’s lack of awareness can range from lack of understanding what postnatal services are to lack of knowledge of importance of postnatal service. Study done in Nepal (Dhakah et al., 2007) reported that the main reason for the non utilization of postnatal care services is lack of awareness or not perceiving a need for it. The study suggested that there is need for awareness raising programmes highlighting the importance of postnatal care service. In this study, 44.2% of the respondents did not attend postnatal care services because they had no problems while 49.5%
failed to present themselves for postnatal care because they did not think it was necessary. Most women lacked awareness about postnatal services and those who reported they knew about the services only knew about immunization and family planning, they lacked adequate knowledge of comprehensive postnatal care services. Another study done in Al-Hassa, Saudia Arabia (Abdul Abyadi 2008) reported that lack of awareness was the main barrier to the utilization of postnatal care services. The results from these studies concur with this study for 41.3% of the respondents had no knowledge about postnatal services and only 16.3% had good knowledge about postnatal care. In Central Province General Hospital, Nyeri MCH clinic where women were supposed to gain knowledge about postnatal care, health talk on postnatal care was not emphasized during Antenatal care for 78.8% reported no health talk given on postnatal care.

Barriers to utilization of postnatal care ranges from lack of awareness, social cultural factors, health provider’s response and facility based. The period following birth in Africa is often marked by cultural practices. The social cultural practices around child birth such as maternal seclusion after delivery and cultural belief play a vital role in non utilization of postnatal care as reported in a study done in Nepal (Dhakal et al., 2007). In this study there are similar findings for non utilization for postnatal care for instance maternal seclusion and religious belief. Providers response, and care in the facility also contributed to poor utilization of postnatal care for instance respondents reported that the health workers were rude and that the waiting time was long. According to (Simelela, 2006), obstacles to wider access still exist, but they may be overcome by overt policy commitment to maternal health services, partnership between stakeholders, community involvement and quality programs. The rude health workers and long waiting time should not be ignored in order to improve utilization of postnatal care services.

**Conclusion**

This study concludes that the utilization of postnatal care services is low at the Central Provincial General Hospital Nyeri as only 14.2% of the respondents utilized postnatal care services.

The study also showed that the most important factors influencing the use of postnatal care services either positively or negatively are maternal age, marital status, knowledge on postnatal care services and the number of children the woman has.

Educating mothers on postnatal care during the antenatal care period was not emphasized and this was a weakness that affects utilization of postnatal care services.

**Recommendations**

The following recommendations may help increase the utilization of postnatal care services in the hospital. In order to improve utilization of postnatal care services, the service providers would benefit from training in how to improve their relationships and communication with clients which would boost the use of postnatal services. This will also help strengthen the client-service provider relationships, enhance client’s satisfaction and therefore help to improve the use of postnatal services.

The hospital should create awareness programmes on postnatal care services should be implemented, targeting women, husbands and community and this may influence utilization of
postnatal care services. In addition postnatal women should also be educated about the risks they face, signs of danger during postpartum period and their right and need to have decision making powers over their own health. The increase in awareness and understanding by mothers about postnatal care during Antenatal clinics so as to improve on the use of postnatal is necessary. Male involvement should be emphasized on in order to support women in decision making especially on seeking health services.

Barriers such as long waiting time, inadequate number of staff and unsupervised students, need to be looked at by hospital authority so as to provide a good conducive atmosphere to the clients and this may improve utilization of postnatal care. The hospital authority should ensure that services are provided at convenient hours for instant creating a lunch hour shift this may help improve utilization of postnatal care services.

The ministry of health will need to ensure that health facilities have adequate capacity in term of staffing in order to adequately provide quality care. Similarly, the ministry of health has to make a comprehensive plan to overcome informational barriers by increasing the women’s understanding and awareness of the need to go for and availability of postnatal services. The government should have guidelines standards, protocols and most importantly human resources for postnatal period for this will help increase utilization of postnatal hence reduce maternal mortality.

**SUGGESTIONS FOR FURTHER RESEARCH**

There is limited information on postnatal care utilization in other areas like the comparative utilization of postnatal services among women in rural and urban settings as well as awareness within communities on the importance of postnatal services.
REFERENCES


A STUDY TO EXPLORE THE EFFECTIVENESS OF A NEWLY DEVELOPED SES SCALE AS A TOOL FOR MEASURING SES OF THE FAMILY IN RURAL AND URBAN AREAS AND TO COMPARE WITH COMMONLY USED SES SCALE

A Case Study By Mrs. Shalini Baskaran, Oman
(MSc Nursing, PhD in Public Health Student of Texila American University)
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ABSTRACT

Socioeconomic status is commonly conceptualized as the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. Socioeconomic status (SES) of the people in a country is very essential as it is one of the important factors determining the health, education, mortality, morbidity and nutritional status of an individual. Socioeconomic status also determines the people’s ability to access, afford, accept and utilize the health care services available in the society. The socioeconomic status (SES) is widely recognized as one of the important factors affecting the health condition of an individual or a family.

India is the second largest populated country and Minister of State for Planning and Parliamentary Affairs Rajeev Shukla in a written statement to Rajya Sabha has stated that 27 crore people live below the poverty line in the country. (India Today).
The Planning commission said that the number of those below the poverty line declined to 21.9% of the population in 2011-12, from 29.8% in 2009-10 and 37.2% in 2004-05. The estimate, based on a survey of household consumer expenditure, showed rural poverty declined to 25.7% from 41.8% in 2004-05, while in urban areas it fell to 13.7% from 25.7%. (Economic Times – 2013)

India as a vast democratic country, there is a need in identifying the actual beneficiaries who will be benefitted by the government programs/subsidies. Socioeconomic status scales are widely used to classify the SES and it is important to analyze that these tools are effective in identifying the SES of the family.

Many different scales are available to measure the SES of a family and most widely used scale in urban community is Kuppuswamy scale (Modified) and it is based 3 categories – education, occupation of the head of the family and income from all the sources. Modified Prasad scale has been widely used in India and it is mainly based on per capita monthly income. Pareek SES classification scale is used in rural areas and it is based on nine characteristics caste, occupation,
education, level of social participation of head of the family, landholding, housing, farm power, material possession and total members in the family. A conversion factor is calculated based on current All India Consumer Price Index (AICPI) to get current income group. The Government of India in the National Family Health Survey (NFHS - II) had used the Standard of Living Index (SLI) scale which contains 11 items viz. house type, source of lighting, toilet facility, main fuel for cooking, source of drinking water, separate room for cooking, ownership of the house, ownership of agricultural land, ownership of irrigated land, ownership of livestock, ownership of durable goods for measuring the SES both urban and rural areas for the entire country. However each of these scales available for measurement have their own advantages and disadvantages.

The present study had explored the reliability of a newly developed scale which need replication to assess the validity of the tool. It can be used in both urban and rural.

KEYWORDS
SES, Healthcare, Poor health, Social measures, Academic Achievement, Risk factors.

INTRODUCTION
GENERAL CONSIDERATION

Socioeconomic status (SES) is assessed based on a combination of factors including income, educational level, and occupation. It is a measure to look at how the families or individuals stand into society with the use of economic and social measures. SES has a strong impact on individuals health and well being.

Socioeconomic status and health are closely related, and SES can often have profound effects on a person's health due to differences in ability to access health care as well as dietary and other lifestyle choices that are associated with both finances and education.

Poverty, illiteracy or lower educational level and poor health are closely related and it affects the productivity of the individual and the society as a whole. Globally there is an increase in the inequity in wealth distribution, resource allocation, utilization and quality of life. So, reducing the gap in socio economic status will benefit the society.

SES AND EDUCATIONAL ISSUES

Many research findings reveal that children from low SES has poor academic skills compared to children from higher SES groups. (Morgan, Farkas, Hillemeier & Maczuga 2009). Initial academic skills are correlated with the home environment, where low literacy environments and chronic stress negatively affect a child’s pre academic skills. The school systems in low-SES
communities are often under resourced, negatively affecting students’ academic progress (Aikens & Barbarin, 2008). Inadequate education and increased dropout rates affect children’s academic achievement, perpetuating the low-SES status of the community. Improving school systems and early intervention programs may help to reduce these risk factors, and thus increased research on the correlation between SES and education is essential.

**SES AND FAMILY RESOURCES**

Families from low-SES communities are less likely to have the financial resources or time availability to provide children with academic support. Children’s initial reading competence is correlated with the home literacy environment, number of books owned, and parent distress (Aikens & Barbarin, 2008). However, parents from low-SES communities may be unable to afford resources such as books, computers, or tutors to create this positive literacy environment (Orr, 2003). In a nationwide study of American kindergarten children, 36% of parents in the lowest-income quintile read to their children on a daily basis, compared with 62% of parents from the highest-income quintile (Coley, 2002). When enrolled in a program that encouraged adult support, students from low-SES groups reported higher levels of effort towards academics (Kaylor & Flores, 2008).

**SES AND THE SCHOOL ENVIRONMENT**

Research indicates that school conditions contribute more to SES differences in learning rates than family characteristics (Aikens & Barbarin, 2008). Schools in low-SES communities suffer from high levels of unemployment, migration of the best qualified teachers, and low educational achievement (Muijs, Harris, Chapman, Stoll, & Russ, 2009).

A teacher’s years of experience and quality of training is correlated with children’s academic achievement (Gimbert, Bol, & Wallace, 2007). Yet, children in low income schools are less likely to have well-qualified teachers. In fact, of high school math teachers in low income school districts 27% majored in mathematics in college as compared to 43% of teachers who did so in more affluent school districts (Ingersoll, 1999). The following factors have been found to improve the quality of schools in low-SES neighborhoods: a focus on improving teaching and learning, creation of an information-rich environment, building of a learning community, continuous professional development, involvement of parents, and increased funding and resources (Muijis et al., 2009).

**SES AND ACADEMIC ACHIEVEMENT**

Research continues to link lower SES to lower academic achievement and slower rates of academic progress as compared with higher SES communities. Children from low-SES environments acquire language skills more slowly, exhibit delayed letter recognition and phonological awareness, and are at risk for reading difficulties (Aikens & Barbarin, 2008). Children with higher SES backgrounds were more likely to be proficient on tasks of addition, subtraction, ordinal sequencing, and math word problems than children with lower SES
backgrounds (Coley, 2002). Students from low-SES schools entered high school 3.3 grade levels behind students from higher SES schools. In addition, students from the low-SES groups learned less over 4 years than children from higher SES groups, graduating 4.3 grade levels behind those of higher SES groups (Palardy, 2008).

In 2007, the high school dropout rate among persons 16-24 years old was highest in low-income families (16.7%) as compared to high-income families (3.2%) (National Center for Education Statistics, 2008).

PSYCHOLOGICAL HEALTH

Increasing evidence supports the link between lower SES and learning disabilities or other negative psychological outcomes that affect academic achievement. Children from lower SES households are about twice as likely as those from high-SES households to display learning-related behavior problems. A mother’s SES was also related to her child’s inattention, disinterest, and lack of cooperation in school (Morgan et al., 2009). Identifying as part of a lower/working class in college has been associated with feelings of not belonging in school and intentions to drop out of school before graduation (Langhout, Drake, &Rosselli, 2009). Perception of family economic stress and personal financial constraints affected emotional distress/depression in students and their academic outcomes (Mistry, Benner, Tan, & Kim, 2009).

NEED FOR THE STUDY

Socio economic status directly or indirectly associated with the health status of the community. Socioeconomic status is a measure of an individual’s or family’s economic and social position based on education, income, and occupation. It is considered as a strong predictor of health that an assessment of the health of would be incomplete without consideration of the socioeconomic status of the people. Research findings show that there is a socio economic status is one of the most powerful risk factor for the poor health outcome. The Education, occupation, place of residences, health belief, income, health behavior, access to health care facility, environment are the inter related factors that determine the health of an individual. The proportion of Individual from a low economic status who suffer from diseases and the mortality rate is comparatively higher than a person from high economic status. Infant and maternal mortality rate, low birth weight babies, homicide and suicide, cardio vascular disease, follow up and outcome, diabetes mellitus has a strong link with Socio economic status. Individual behaviour has an association with health and socio economic status. Eg. Smoking and alcohol. Heath care demand is great for an individual from a lower socio economic status but the available resources like money, social support, access to health care are less than the demand.

Many research studies have found that a higher level of educational attainment is a strong predictor of access to economic and healthcare resources. The variation in educational attainment may contribute to the differences in access and utilization of health care among different social groups.
Poverty and low living standards are powerful determinants of ill health and health inequity. Social economic status provides a deeper understanding of clinical phenomena. The poor had a higher incidence of some diseases whereas the rich have others. Health practices like the use of health services, welfare and maternity clinics, and methods of infant feeding were found to be correlated with social class.

Assessment of socioeconomic status (SES) is an important aspect in community based studies. Evaluation of SES of a family would mean the categorization of the family based on defined variables such as, education, occupation, economic status, physical assets, social position etc. Some of these variables can be evaluated simultaneously. Several methods or scales have been proposed for classifying different populations by socioeconomic status: Rahudkar scale 1960, Uday Parikh scale 1964, Jalota Scale 1970, Kulshrestha scale 1972, Kuppuswamy scale 1976, Shrivastava scale 1978, Bharadwaj scale 2001(1-7). The most widely accepted scale for urban populations has been proposed by Kuppuswamy in India in 1976. A study has recently been suggested for updating the Kuppuswamy scale. A study conducted by O.P. Aggarwal in 2005 came out with a new scale and there is a need to repeat the study to check the validity of the scale.

**STATEMENT OF THE PROBLEM**

A study to explore the effectiveness of a newly developed SES scale as a tool for measuring SES of the family in rural and urban areas and to compare with commonly used SES scale.

**TYPE OF RESEARCH**

**Design:** Cross sectional / replication study.

**OBJECTIVE**

1. To assess the SES of families in rural areas with the new SES scale.
2. To assess the SES of families in urban areas with the new SES scale.
3. To compare the SES with the commonly used SES scale.
REVIEW OF LITERATURE

Adler NE, Ostrove JM in a research finding showed that the nature of the relationship of SES and health, revealing a graded association; SES is important to health not only for those in poverty, but at all levels of SES. On average, the more advantaged individuals are, the better their health. There are multiple pathways by which SES determines health; a comprehensive analysis must include macroeconomic contexts and social factors as well as more immediate social environments, individual psychological and behavioral factors, and biological predispositions and processes.

O.P. Aggarwal, S.K. Bhasin, A.K. Sharma, et al conducted a cross sectional community based study to develop a new scale for more accurate assessment of socio economic status families in India. By a process of random sampling, 2095 families in the National Capital Territory of Delhi were studied to find out their SES by using this scale. It was found that 31 families (1.5%) belonged to Upper high SES, 221 (10.5%) to High, 291 (14.2%) to Upper middle, 507 (24.2%) to Lower Middle, 745 (35.6%) to Poor and 294 (14.0%) belonged to Very Poor socioeconomic category. The instrument serves the purpose of categorizing the families in different socio-economic strata. However, it needs to be tested in other areas to determine its validity, reliability and utility.

Lipowicz A1, Koziel S, Hulanicka B, Kowalisko A. (2007) observed that socioeconomic status (SES) is associated with frequency of cardiovascular disease. Both men and women of low socioeconomic position have increased risk of cardiovascular disease morbidity and premature death. In this study the relationship between SES in childhood, and health status at the age of 50 years was examined. Socioeconomic status in childhood was measured using objective (father's educational level and number of children in the family) and subjective (self-assessed SES in childhood declared in early adulthood) indicators. Data from the Wroclaw Growth Study were completed when subjects were 50 years old, and information concerning health status was added. The results indicated that the objective, universally used measures of SES in childhood such as father's educational level and size of family did not show any essential relationships with health outcomes in adulthood, both for men and women.

In 2014, Kader M1, Perera NK2 conducted a study to identify significant socio-economic and nutritional determinants associated with LBW in India. Family Health Survey-3 (NFHS-3) of India was analyzed. A total of 20,946 women (15-49 years) who gave birth at least once 5 years preceding the NFHS-3 were included in this study. Infant's LBW (<2500 grams) as outcome variable was examined in association with all independent predictors as infant's sex, maternal household wealth status, caste, age, education, body mass index (BMI), stature, anemia level, parity, inter-pregnancy interval, antenatal care received, and living place. Almost 20% of the infants were born with LBW. Mother's low education level, BMI <18.5, short stature (height <145 centimeters) and lack of antenatal visits (<4 visits) were significant predictors of LBW. Male gender has a protective effect against LBW. Maternal education, nutritional status and antenatal care received are key determinants that need to be addressed to reduce prevalence of LBW in India. Continue implementation of multifaceted health promotion interventions are
needed to address these factors effectively.

The commonly used available scales for measurement of socio-economic status (SES) with some cross regional applicability are old and have lost their relevance. There is a need for the development of a valid and reliable instrument for measurement of SES in rural and urban communities in India. The present study was undertaken to develop a cross regionally applicable scale for the purpose of enlisting true measures of socio-economic items applicable in multilingual, multicultural, multi religious, setting of the country. For developing the scale, seven indicators (house, materials possession, education, occupation, monthly income, land, social participation and understanding), presumably determining the socioeconomic status were selected. These indicators were named as profiles. Thus, initially the scale had seven profiles and every profile contained five alternatives. This instrument was prepared on a 10-point scale. Weightage system of scoring (varying from 2 to 10) was followed from first to sixth profile while the additive pattern of scoring was followed in seventh profile. The final version of the scale was arrived at through three trial administrations on rural and urban families. The basis of selection of the families for the first two trials was stratified random. The validity and reliability of the scale was established through a defined visual analogue scale (VAS) and test-retest methods. Both the initial version as well as the final version of the scale for the measurement of SES of incumbents had seven profiles. The difference between the two versions was in terms of contents and range of items in different categories of SES. The final version was arrived at through field trials and suggestions of the experts. The reliability of the scale was high with a correlation coefficient of 0.998. The new scale appears to be a valid and reliable instrument for the assessment of socio-economic status of the families/individuals from urban as well as rural areas in India Tiwari SC1, Kumar A, Kumar A. (2005)

Rahul Sharma and Narinder K. Saini (2014), One of the scales widely used and quoted even today is the one developed by Kuppuswamy. The Kuppuswamy scale in its various forms has held steady over three decades now and is still widely used as a measure of socioeconomic status in the urban population. However, it is important to discuss the applicability in the changed modern scenario. This was necessitated as monetary inflation means the rupee does not retain the same value each year in terms of the goods/services that may be purchased with the same amount.[4] The revision is linked to the All India Average Consumer Price Index for Industrial Workers (CPI-IW). The Kuppuswamy scale has now been around for more than 3 decades. However, there may be certain shortcomings in its use and application that need to be discussed. Improvement in these possible lacunae is a priority area considering the wide use of the scale in published literature and in family health advisory postings in urban areas of medical undergraduate students.

Shankar Reddy Dudalal, Arlappa (2013 ), suggested that it is imperative to understand the Socio-Economic Status (SES) of the community in order to correlate its impact on health and quality of living standards. Almost all community- based studies focus on socio-economic stratification, which is the key parameter for proper understanding the affordability of the
community of health services, amenities and their purchasing capacity. When it is taken as a summation of education, occupation and income, it reflects the value system expected for that level of education and occupation.

Several experts recommended different scales to measure the Socio-Economic Status in both rural and urban areas. However, Prasad's classification (1961) based on the per capita monthly income has been widely in use in India. It is computed as: Per capita monthly income = Total monthly income of the family/Total members of family.

The advantage with Prasad's classification is that it takes into consideration only the income as a variable and it is simple to calculate. This can be applied to assess the socio-economic status in both rural and urban areas. This classification was modified in 1968 [4] and 1970 [5] by Prasad BG. It was later modified by Kumar due to the inflationary trend in economy in 1993-94. An attempt has been made to link it with the all India consumer price index (AICPI) and a modified classification has been proposed with a built in provision of its upgrading from time to time to make it relevant and useful.

Correction Factor (CF) has been developed in relation to the base year of 1993-1994 as 4.93%, when the new series of the All India Consumer Price Index for Industrial Workers (AICPI) started [7]. The hypothetical value was calculated based on the concept of the cost-of-living index (COLI), which is pertaining to the existing Wholesale Price Index (WPI) in India.

As the COLI is not directly observable, the WPI employs a number of formulae that offer approximations to the measurement objectives. WPI uses the Laspeyres formula to average the price changes due to inflation across different categories of items, because COLI for the each current month is based on the cost of that month's market prices for the items used by the community. COLI changes due to inflation in wholesale price.

The Correction Factor should be multiplied with value of AICPI to get the multiplication factor and divided by 100. It is a simple method of multiplying the income limits of classification with a multiplication factor and rounding off the values to the nearest rupee. The next step is to multiply Prasad's income limits by the multiplication factor. AICPI for Industrial Workers (Base 1982 = 100) shows the current Price

Samuel P1, Antonisamy B, Raghupathy P, Richard J, Fall CH.( 2012) examined associations between socio-economic status (SES) indicators and cardiovascular disease (CVD) risk factors among urban and rural South Indians. Data from a population-based birth cohort of 2218 men and women aged 26-32 years from Vellore, Tamilnadu were used. SES indicators included a household possessions score, attained education and paternal education. CVD risk factors included obesity, hypertension, impaired glucose tolerance or diabetes, plasma total cholesterol to high density lipoprotein (HDL) ratio and triglyceride levels and consumption of tobacco and alcohol. Multiple logistic regression analysis was used to assess associations between SES indicators and risk factors. Most risk factors were positively associated with possessions score in urban and rural men and women, except for tobacco use, which was negatively associated.
Trends were similar with the participants' own education and paternal education, though weaker and less consistent. In a concurrent analysis of all the three SES indicators, adjusted for gender and urban/rural residence, independent associations were observed only for the possessions score. Compared with those in the lowest fifth of the score, participants in the highest fifth had a higher risk of abdominal obesity [odds ratio (OR)=6.4, 95% CI 3.4 -11.6], high total cholesterol to HDL ratio (OR=2.4, 95% CI 1.6-3.5) and glucose intolerance (OR=2.8, 95% CI 1.9-4.1). Their tobacco use (OR=0.4, 95% CI 0.2-0.6) was lower. Except for hypertension and glucose intolerance, risk factors were higher in urban than rural participants independently of SES. In this young cohort of rural and urban south Indians, higher SES was associated with a more adverse CVD risk factor profile but lower tobacco use.

MATERIALS AND METHODS

This exploratory study was conducted in the rural and urban field in the month of March 2014. A total of 30 families were included in the study; of which 15 were from the rural setting (Sirumoor village) and 15 from urban setting (Vellore). The study subjects were the permanent residents of the area. The families were selected by using systematic random sampling technique (every 5th house). All sections of the society living in these areas were included. Those families who were cooperative and willing to participate were included in the study. The data was collected by interviewing the adult responsible respondent in the family.

For comparison of the scales, in the rural area two commonly used SES scales were applied on the same family at the same time one after the other by the investigator; viz. Prasad scale and the new scale. Similarly in urban areas two commonly used SES scales viz. Modified Kuppuswamy scale and the new scale were applied. The correction factor for Prasad and Modified Kuppuswamy classification were calculated by taking All India Consumer Price Index (AICPI) as on March 2014. The data was entered in Microsoft excel-2007 and the analysis was done using SPSS 16.0v. To measure the agreement between the scales, Spearman's rank correlation was applied.

RESULTS

In the present study 30 families were visited and interviewed; of which 15 were in rural and 15 in urban settings.
Among the 15 families surveyed at rural setting, it was observed from Table 1 that, majority 9 (60%) belonged to class I, 3 belonged to Class II and 3 to Class III (20%). When for the same families, the new scale was administered showed, majority of them (53.33%) belonged to Upper middle and 7 (46.66%) belonged to Lower middle class.

When the z scores of Prasad scale, Kuppusamy’s scale for each household were compared with one way ANOVA there was no statistically significant difference observed (F = 0.071, P = 0.9).

From Table 4 in the urban setting, among the 15, 5 families were classified as high class in the new scale and as upper class in the Kuppusamy’s scale, and 10 (66.66%) families belonged to upper middle class in both the scales which shows that there is high degree positive correlation between these two scales (R = 0.96, P = 0.9).

It is shown that in the urban setting (n=15), 10 belong to upper middle and 5 belong to upper scale in both the SES scale where as in the rural setting, 53 – 60 % belong to upper middle and 40 – 46.66 % belong to lower middle class. However due to small sample size the result cannot be generalized.
DISCUSSION

In the urban setting, both the scales measure the SES status of the families as same. So, Kuppusamy scale is found to be easy to administer as it includes only three main parameters and time consumption is less. New scale has 22 components but the status measured is same with the Kuppusamy’s scale. Where as in the rural setting, the families belonged to either Class I, II or III when Prasad’s scale was administered but the families belonged to Upper middle and lower middle only and no families belonged to upper middle or upper class. This should be focused. New scale seemed to be effective for use in rural setting compared to urban setting. Further study should be conducted with large sample to find the relevancy of the scale and to generalize the result.

CONCLUSION

The important determinant of the standard of living and health status is Socio-Economic Status of the individual/community. SES influences on the incidence and prevalence of various health related conditions. Socio- Economic Status also influences social security in terms of the accessibility, affordability, acceptability and actual utilization of various health facilities. Establishing a relevant scale to measure the SES is very essential to deliver the health care to all sector of people.

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SOCIAL AND BEHAVIORAL CHANGE COMMUNICATION: PROGRAMMING AND BARRIERS TO IMPLEMENTATION IN DEVELOPING COUNTRIES

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ABSTRACT

This study examines determinants of health and explores how these interact to help man attain or defer from the desired health outcomes. It further examines the role communication plays in an attempt to “influence” the actions of man towards attaining the desired health outcomes emphasizing man’s interaction with his natural environment. Challenges that ensue in this context were analyzed from a programmatic point of view as seen in developing countries and recommendations made based on this hindsight.

KEYWORDS

Behavior change, Barriers, Social communication, Developing countries, IEC, SBCC.

INTRODUCTION

The definition of health by the WHO (World Health Organization) as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” underscores the role of myriads of health determinants around humans and their strong interrelationship with him. This implies that people live and interact with factors that strongly influence their health and health outcomes. These factors include the individual’s lifestyle and personal indulgences; his social net worth and network within his community; and his general socioeconomic, cultural and environmental living conditions.
Consequent to these factors, the individual learns, assumes and/or develops attributes that either promote or hinder attainment to a recommended level of health outcomes. Health communication suffices therefore to redirect the course towards attaining this desired level of health outcome. Over the years, health communication has experienced change in definition and adopted changing approaches with the aim of attaining its goals. These changes in one hand reflect dynamism of a changing world and on the other hand, show the capability of this discipline to accommodate this change.

**TECHNICAL AND HISTORICAL OVERVIEW**

The recent change in terminology from behavioral change communication (BCC) to social behavioral change communication (SBCC) shows the emphasis for health outcomes improvement through healthful behaviors for individuals and groups without losing emphasis on the social context, systems and processes that are the true determinants of health.

Besides those between a patient and the immediate healthcare provider, health communication over the years has adopted different approaches starting with health education defined as any combination of learning experiences designed to help individuals and communities improve their health by increasing their knowledge or influencing their attitudes (WHO 2013). Immediately after that and emphasizing on the communication aspect, Information, Education and Communication (IEC) emerged following the use of mass media (ranging from one way form of communication to entertainment) as a powerful tool for disseminating information. A shortcoming with this is its dominance on expert opinion and assumptions that people will accept the health advice if they are provided with the right information. In these, the perspectives of the people were not put into cognizance, and evidence proved that results from these approaches were not as expected and in many cases, health outcome did not change.

With a closer observation on the drive and success achieved in advertising sector, where consumer analysis and perspectives were the integral components to their recorded success, health communication adopted the social marketing approach. Social marketing uses research to bring consumer’s perspective to the forefront, thereby achieving successes though arguably limited to the procurement, distribution, promotion and sale of health products (at cheaper rates). With the social marketing approach, emphasis was not laid on the correct and consistent use of the products; rather successes were measured on the number of health promotion items sold/exchanged.

This gap was addressed by the introduction behavioral change communication (BCC). BCC enabled behavioral change in health promoting interventions that goes beyond exchange of products but includes service provision (example, the need for and advantages of exclusive
breastfeeding). BCC is based on evidence from research on the use of communication to promote behaviors that lead to improvements in health outcomes of individuals. It uses results from formative research to enable people to understand health issues from their own perspectives and contextualized factors to improve their health outcomes.

Success of BCC was change at the level of the individual and its efforts were directed largely on individual behavior change (Story and Figueroa 2012). Meanwhile, there is growing knowledge that behaviors are grounded within the socio-ecological context of the individual and that for effective change to occur, strong support from multiple layers of influence (as described above) is required. This gap gave rise to the expansion of the scope and approach of BCC to take into cognizance, influence and support of the social environment in which the individual lives and thus becomes social and behavioral change communication (SBCC).

SBCC as a health communication tool is research-based and a consultative process that uses communication to foster and facilitate change in behavior and support the requisite social change aimed at improving health outcomes at multiple levels. It’s a process of promoting and sustaining healthy changes in individuals and communities and involves participatory development of appropriately tailored health messages and approaches conveyed through a variety of communication channels. To realize its set of objectives, SBCC drives on evidence from epidemiological research and takes into recognition, client perspectives and needs. SBCC is broad in scope and relies on the comprehensive ecological theory that drives change at the individual, broader environmental and structural levels. It is the communication for change in behavior or action of the individual, collective actions taken by groups, social and cultural structures, and the needed enabling environment requisite for the desired change.

Health communication using the SBCC approach is systematic and socio-ecologic in nature, realizing the dependency of individuals and their immediate social relationships to the larger structural and environmental systems which include the roles of gender; power; culture; community; organization; political and economic environments (Leclerc-Madlala 2011). In SBCC, the expected unit of change is the community (UNICEF) and it involves communication (using appropriate channels and themes fit for the target audience), behavior change and social change.

**COMPONENTS OF COMMUNICATION**

In depth understanding of the components of communication and factors that can affect any of these in the context it is implemented are pre-requisite to effectively communicating for behavioral change. Below are components of communication in behavioral change as well as factors that can affect them in line with URC’s communication intervention cycle (Figure 1).
SENDER/ENCODER: This is the person originating or sending out the message and can be seen as the agent of change. The message passed could assume the form of words, graphics or visual aids. The background, knowledge, skills, views and occasionally, beliefs/passion of the sender are major factors of influence on the impact of the message. The verbal (word and grammar choice) and non-verbal symbols (example, body language and facial expression) chosen are essential in ascertaining interpretation of the message by the recipient to reflect what was intended by the sender.

CONTEXT: The context in which communication takes place plays very significant role in the impact of the message and thus has significant effect on communication. Every communication takes place in a context which can be physical, social, chronological or cultural. The social attributes (including traditions, beliefs and levels of education) of a target audience constitute its context. Likewise, timing and the environment of a communication intervention are contextual and for a communication intervention to achieve its intended results of behavioral change among its audience, these contextual characteristics (especially of the receiver) should be taken into consideration.

MESSAGE: Message is the object of communication or a key idea that the sender wants to communicate. It elicits the recipient’s response and may be in the form of spoken, written, visual and physical signals. Communication process begins with deciding about the message to be conveyed and it must be ensured that the main objective of the message is clear which reflects in its wordings, directness and purpose.

Each message has a specific purpose:

To convey important facts or information
To persuade the receiver to accept or reject certain conditions or actions
To motivate the receiver to act in a specific way
To stimulate discussion about a particular issue, or
To entertain the receiver

Medium: Medium can be defined as a means for exchange or to transmit the message. For a message to be effectively transmitted, a medium appropriate for both sender and receiver is required. In order for the recipient to correctly interpret the message, detailed attention should be paid to features of the medium for the message and these include: Importance of the message, practicality of a better alternative medium, the receiver’s preferences and communication style and time need for feedback.

Recipient: Recipient also known as the decoder is a person for whom the message is intended or targeted at. The degree to which the decoder understands the message is dependent upon various
factors as listed above as well as the knowledge of the recipient, their responsiveness to the message, and the reliance of encoder on decoder.

**Feedback:** Feedback is the component that makes communication a two way process. It permits the sender to analyze the efficacy of the transmitted message and helps the sender to confirm the correct interpretation of the message transmitted by the decoder. Feedback may be verbal (through words) or non-verbal (in form of smiles, sighs, memos, reports etc.) and can manifest in the form of change in ways things were previously done.

Figure 1: URC-CHS's Communications Interventions Cycle (available at: http://www.urc-chs.com/health_communication_and_behavior_change).
Types of behaviors: Behavior as defined by online reference dictionary is the aggregate of the responses or reactions or movements made by an organism in any situation. Behaviors are classified as habitual, normative and preventive (Aboud and Singla 2012).

- Habitual behaviors: These are behaviors performed automatically without a thought through. They are acquired over time and are often more difficult to change.
- Normative: These are built around traditions and accepted as normal behaviors.
- Preventive: This often lacks a salient immediate outcome.

BARRIERS TO BEHAVIORAL CHANGE:

Below are some identified challenges hindering success with behavioral change communication interventions or social marketing interventions for behavioral change.

Formative research: The time and resources needed for formative research and strategy development are significant that programmers often find reasons on the argument not to embark on such task. Among the argument include: previous programs have been judged successful without formative research, difficulty in finding needed expertise for the task in-country and that simple messages are known. However, evidence has shown that communication interventions not based on formative research may not achieve behavioral change because it may neither address the reasons for the current practices nor barriers to improved healthy behaviors. Formative research enables programmers to understand the issues from the perspective of the target audience thereby come up with messages and strategies that directly address such issues. Where funding constraints palpably limit a formative research, detailed literature review combined with expert opinion can serve as an alternative. On the perspective that previous programs have been judged successful without formative research, there is a growing body of evidence that program evaluation have emphasized more on finding successes (even where inexistent) rather than documenting findings that serve as lessons learned irrespective of the extent of recorded success.

Beginning formative research prior to the project being funded: Behavioral change communication interventions are usually and largely, driven with donor funds. Considering that these projects are implemented within a time frame, implementers might be constrained to conduct formative assessments requisite for the desired change. Also, funds for these assessments might not be accommodated in the grant on consideration that these assessments are supposedly “pre-project”. This leaves the implementers with 3 options of either basing the intervention on assumptions; relying on assessment previously conducted by line ministries (which in developing countries are often not done or evidence from such might have been
obsolete) or using the first year of implementation for formative research and baseline assessment. The choice on any of these is a function of access to fund and availability of time which usually lie outside the direct control of the implementers.

**Lack of understanding in government ministries of social marketing:** For any behavioral change communication intervention or project to be recorded successful, its roll out should be made to be sustainable. This includes buy-in of multi-level stakeholders including the relevant government ministries. Government ministries usually have staff well knowledgeable in health education. What may well be lacking is an understanding of formative research, behavior-change strategy formulation, state-of-the-art message design and production of materials, and monitoring, evaluation and pretesting. It becomes the role of the implementers to address these gaps by rolling out skill transfer strategies like seminars, workshops and mentoring and ensuring that key decision makers participate at these sessions rather than send in representatives. These work to create shared vision and common understanding for successful and sustainable interventions.

**Political and physical environment:** In most developing countries, there is strong diversity in geography and population of the people and this complicates the development of SBCC programs. This is further worsened where vast distances must be covered, multiple languages spoken and diverse traditions are included in SBCC program for single location (FHI 2002). Where political and/or commercial interests appear to constraint messages for the SBCC intervention, professional ethics provides a useful guide for the development of appropriate messages.

**Linkages and coordination:** There have been situations where multiple organizations and agencies program SBCC for related change objectives in the same location. In such cases, there is need for the messages and information to be coordinated and speak to the same point. Building and maintaining linkages and coordination is such situation have been shown to be an ongoing challenge. It has been recommended for a technical working group to address this gap.

**Measuring impact for decision makers:** As aforementioned, time and funding constraints with SBCC often create secondary challenge of accounting for the efforts invested in the intervention. This usually arises from poorly defined indicators for measuring successes recorded. In most cases, the set of indicators are limited to input or process indicators without much research into the outcome and impact indicators. This also results from not having control groups for purposes of comparing results. Though the challenges with these are plausible, they do not justify not having demonstrable body of evidence that can be used to account for resources and efforts invested in the SBCC intervention.
Other reasons why people do not change their behaviors include (Jhpiego Corporation):

*People may not*

- Understand the message
- See themselves as vulnerable
- Trust the bearers of the message

*People may*

- Think the short-term benefits of current behaviors outweigh the long-term risks.
- Some “healthy choices” are costly
- Recommended behavior may conflict with beliefs

**CONCLUSION**

Communication for behavioral change is critical in the process of promoting people’s health. Its successes are embedded on deeper understanding of principles critical for the required impact and needs exchange of appropriate messages targeted at a properly segmented audience based on their context. Proper documentation of activities and dissemination of findings are important not only for purposes of accountability for donors; it also adds to the body of evidence and lessons learned.

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