Clinics of Surgery

Communicating Anti-Malaria Drugs Amongst 'A' Group Gynotype Groups in South East Nigeria

Njoku C[1], Ngene AH[2*], Udeh K[3], Chukwuma UA[4] and Oyeduntan EA[5]

[1]Department of Mass Communication, University of Nigeria, Nsukka, Nigeria

[2]Department of Mass Communication, Ibrahim Badamasi Babangida University, Nigeria

[3]Department of Mass Communication, Mountain Top University, Nigeria

[4]Department of Mass Communication, University of Nigeria, Nsukka, Nigeria

[5]Department of Mass Communication, Lagos State Polytechnic, Nigeria

*Corresponding author:

Andrew Hyacinth Ngene,
Department of Mass Communication, Ibrahim
Badamasi Babangida University, Nigeria,
Tel: 08132661737,
E-mail: andrew.ngene@ibbu.edu.ng

Copyright:

Citation:

1. Abstract

The effective communication of risks involved in anti-malaria dosage information dissemination is fundamental in health education and advocacies. Although there is no known pattern of communication perspective regarding numerous health risks involved in self-medication of anti-malaria drugs in Nigeria setting especially as more than half of the entire population relay on self-medication because of poor healthcare system. This paper reviews and evaluates the relative merits of two approaches to health risk communication of anti-malaria drugs on patients in Nigeria. One approach relies on the presentation of numerical information regarding the probability of a health problem occurring annually despite the claim of malaria eradication, whereas the other relies on the presentation of information about the antecedents and consequences of a health problem. Because people have considerable difficulty understanding and using quantitative information on the anti-malaria leaflets, the effectiveness of interventions that rely solely on numerical probability information has been limited. Interventions that provide people with a broader informational context to think about a health problem have had greater success systematically influencing perceptions of personal risk but have several important limitations. However, before any final conclusions can be drawn regarding the relative merits of different health risk communication strategies, investigators must agree on the specific criteria that should be used to identify an effective intervention. The finding pre-supposes a recurring pattern of approach to health risk information based on the peculiarity of recent interventions in the health sector.

2. Introduction

Malaria is a major public health problem in many sub-Saharan African countries. In Nigeria in particular, malaria is the most common disease suffered by many especially among certain group like those of genotype AA" [1-5]. The most common cause of this illness is mosquitoes as the poor drainage system breed lots of these insects. It is not even a season as the number of patients hospitalised run in thousands. Ironically, many people especially the most populated regions who are illiterate indulge in self- medication which is causing a more triggering effect as some are prone to death by over dose of anti-malaria drugs, [30, 19].

It mostly affects children under-five years of age [5-10], pregnant women and migrants/visitors from non-malaria endemic regions [31]. In general, malaria is a major cause of illness and death among adults and children in Nigeria. The prevalence of malaria [11-19], especially amongst children has been reported to be high in Nigeria at around 43.2 %. Up to half of Nigeria's population is at risk of at least one malaria episode every year [20].

The disease accounts for 60 % of outpatient visits and 30 % of hospitalizations among children under five, 25 % deaths of infants and 11 % maternal mortality [31]. The occurrence of malaria in

some households cause significant economic burden which often leads to catastrophic health expenditures [32]. Key malaria prevention tools in Nigeria include prevention through the distribution of Long Lasting Insecticide-Treated Nets (LLINs) and Indoor Residual Spraying (IRS). The distribution of LLINs [21-26] is primarily through free public sector campaigns such as integration with immunization and antenatal care services. Some LLINs are subsidized through the commercial sector [13]. In 2015, the world health organization also embarked on a long advocacy where millions of mosquitos' nets were distributed to over 90% households in Lagos state and other states of Nigeria [28-30].

The first line drugs commonly consumed by many Nigerians are; Artemisinin-based Combination Therapies (ACTs), which should only be taken after parasitological diagnosis with either microscopy or rapid diagnostic tests (RDTs) [33-35]. Again, the Sulphadoxine Pyrimethamine (SP) is used for intermittent preventive treatment in pregnancy as these groups are easily attacked by much exposure and with devastating effects if not curtailed early. However, with these different malaria attacks, the prevalence still remains unabated, [13]. A range of explanations have been put forward as to why this is the case [36]. Several studies point to low level of consumers and provider's knowledge, awareness and adoption of available and useful malaria drugs [37].

Deficiencies in the practices of both private and public health care providers also compromise the effectiveness and cost-effectiveness of malaria-case management and have led to calls for a variety of interventions to improve the quality of treatment and advice given to patients and the general public, [19]. Constant surveys from Nigeria show few febrile patients attending public health facilities, pharmacies and patent medicine dealers received recommended treatment for malaria and those that did were frequently given an incorrect dose [19]. Unfortunately, the group with genotype "AA" seems to be the most affected of malaria from clinical evidences and secondary data from most public hospitals in Nigeria [38-40].

Some recent studies show febrile patients request specific anti-malarial and in most cases; this was not the nationally recommended treatment (p.17) [41-45]. Another Nigerian study showed that patients commonly misinterpret signs and symptoms of malaria due to their personal experience or mis-information received from friends, relations and neighbours. In Nigeria, there is mounting evidence that malaria symptoms are often perceived wrongly or not recognized and continue to go untreated [2].

Effective communication helps to ensure that malaria control tools are appropriately delivered and consumed. Several studies in Nigeria and in other malaria endemic countries have shown the positive effect of using structured education initiatives or programmes on increasing coverage, improving treatment and increasing knowledge of providers and community members [29, 23].

A study in Tanzania showed that 3 million people were reached

with information on malaria prevention and treatment from road shows and mobile video units [40]. Studies from other African countries show that information delivered through print media, health workers, posters, radio and television on malaria prevention and treatment improved malaria health seeking and treatment behaviours as well as malaria prevention [29, 23].

Studies have also shown that it is important to ensure that information given to both providers and consumers is [21]. The communication strategic framework developed by the Federal Ministry of Health in Nigeria in 2008 is designed to raise awareness for malaria prevention and control strategies. The strategy recommends the use of mass media, community mobilization, advocacy and other forms of communication to improve the knowledge, attitude and practices on malaria [13].

The practical design and implementation of these strategies, however, needs to be informed by an understanding of the different sources of information and types of communication channels currently used in the local context [20, 44] Patients' perceptions of the quality of the healthcare they received are highly dependent on the quality of their interactions with their healthcare clinician and team [46].

There is a wealth of research data that supports the benefits of effective communication and health outcomes for patients and healthcare teams. The connection that a patient feels with his or her clinician can ultimately improve their health mediated through participation in their care, adherence to treatment, and patient self-management. Yet, it is estimated that one-third of adults with chronic illnesses like malaria which is common in Nigeria, underuse their prescription medication due to cost concerns; yet they fail to communicate this information to their physician. Another study found that less than half of hospitalised patients could identify their diagnoses or the names of their medication(s) at discharge, perhaps due to lack of clarity and illegibility of messages contained in the drug leaflets which is an indication of ineffective communication with their physicians [47].

This paper therefore, seek to examine how health risk communication can be managed to properly inform patients on how to treat malaria using the messages contained in the anti-malaria drugs leaflets, while supporting the future development of malaria communication strategies to ensure they are context appropriate and evidence-based. The following objectives are outlined to guide this study:

1. To find out how legible the manifest content of communication of Anti-malaria drugs leaflets are to the consumer.

2. To ascertain the clarity of health risk messages contained in the leaflets of Anti-malaria drugs.

3. To determine the relevance of the message contents of the anti-malaria drugs leaflets to the consumers.

4. To determine the easy comprehension of the language use in the anti-malaria drug leaflets. The following research

questions were formulated based on the above stated research objectives:

1. How legible is the manifest content of communication of Anti-malaria drugs leaflets are to consumers?

2. How clear is the health risk messages contained in the leaflets of Anti-malaria drugs?

3. What is the relevance of message contents of anti-malaria drug leaflets to consumers?

4. How easily comprehensible is the language use in the anti-malaria drug leaflets?

3. Literature Review

Malaria is known as one of the killer diseases in Africa and kills about 20% of the population in Nigeria alone of which pregnant women and children are the most vulnerable. According to malaria consortium of Nigeria (2014), 11% percent of all child deaths in the world happen in Nigeria. This account for nearly 250,000 of Nigerian children who die every year from malaria. Malaria is a very serious disease that causes high fever and chills. It can be contacted from a bite from an infected mosquito.

Malaria is rare in most developed world like the United States of America but is more common in Africa, Southern Asia, Central America and South America. Research evidence indicates that there are strong positive relationships between a healthcare team member's communication skills and a patient's capacity to follow through with medical recommendations, self-manage a chronic medical condition, and adopt preventive health behaviours.

Studies conducted during the past three decades show that the clinician's ability to explain, listen and empathize can have a profound effect on biological and functional health outcomes as well as patient satisfaction and experience of care. An Overview of Health-Risk Communication Risk communication, simply put, is the exchange of information about risks. It also means "(exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility" (Oxford English Dictionary, 2013).

Risk refers to the uncertainty of danger, hazard, or exposure to peril that we face every day [1]. According to Sandman, (1994), helping people understand risks and ramp up or tone down their reaction to risk is often the goal of risk communicators. At its best, risk communication is "An open, two-way exchange of information and opinion about risk leading to better understanding and better risk management decisions" [7]. Extension professionals, familiar with the culture and needs of their audiences, are uniquely positioned, once relationships of trust have been established, to practice risk communication. Risk communication is a dialog. Having recognized the weaknesses of one-way risk communication, the National Research Council (NRC) in 1989 published a ground-breaking book, Improving Risk Communication. As defined in this book, risk communication involves understanding the reaction to risk messages and to how risk management is structured in addition to communicating about the risk itself.

Risk communication is an interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reaction to risk messages or to legal or institutional arrangements for risk management (NRC, 1989). Risk communication as defined by the NRC inherently involves multiple messages. There may be several parties making competing claims about a risk. In this situation risk messages are addressing both uncertainty—by sharing and assessing available evidence-and ambiguity-by promoting a particular interpretation of the evidence.

Competing interests will naturally lead to competing risk messages and confusion among laypersons. The solution is more communication, not less. The terms "risk" and "crisis communication" are often used interchangeably. However, the point of risk communication is to avoid crises. Risk communication is forward-looking in that it identifies, in advance, situations where decision-making is required in the face of uncertainty. Ideally, the application of effective risk communication will prevent crises because stake-holders have already developed an understanding of the best way to respond in such situations. Crisis or emergency risk communication comes into play in the face of a disaster and its aftermath. Crisis communication also may encompass some aspect of reputation management (whether of a government agency or private company), whereas, emergency risk communication is practiced by impartial credible organizations (which can also be government agencies or private companies).

Risk and emergency risk communication are integrated in the Crisis and Emergency Risk Communication (CERC) model [35] developed by the Centre for Disease Control and Prevention (CDCP). The phases and their objectives are described in the following table.

Table 1: Crisis and Emergency Risk Communication (CERC) model I. Pre-Crisis Convey Risk Messages and Warnings, Make Preparations II. Initial Incident Reassure, Reduce Uncertainty, and Promote Self-Efficacy III. Maintenance Continue as in II Incorporating Feedback IV. Resolution Provide Recovery Updates, Discuss Causes and Future Risk Management V. Evaluation Discuss Adequacy of Response, Communicate and Act on Lessons Learned Source: [35] Since "health risks seem to loom around every corner, posing a constant threat to the public" [10], the processes of creating and disseminating health-risk messages ought to be informed by the cultural perceptions of health and illness in each society.

From a cultural perspective, Pieterse (1996) cited in [10] argues that in the modern world, "There are no fixed boundaries other than those of common social experience; therefore, there are no territorial limitations to culture". Pieterse also argues that "while borders and boundaries are a function of differentials of power, they are social constructions that are embedded and encoded in cultural claims". Thus, Pieterse points to a new global reality in which interactive cross-cultural human relations and cooperation make communicating health risks to a diverse population a complex but challenging undertaking. Malaria Treatment Sources Different factors affect the source of reception of malaria treatment services especially perceived severity ranging from simple fever or uncomplicated malaria to severe or complicated malaria [27].

Uncomplicated presentations are more likely managed at home initially, while cases with convulsions or severe malaria are more likely to seek care from a health care practitioner. Multiple care seeking events and switching between types of providers is also common [11]. According to [34], Patients in Nigeria access treatment for malaria in a diverse range of outlets in the public and private sectors. The public sector consists of Primary Health Centres (PHC), secondary and tertiary hospitals, while the private sector is large and heterogeneous consisting of a wide range of providers both registered and unregistered such as private hospitals, pharmacies, patent medicine dealers and traditional healers with patent medicine dealers accounting for more than half of all providers.

However, there is a possibility that the poor and rural dwellers do not have access to appropriate treatment due to the limited number of trained providers and inequities in the distribution of these providers in favour of the urban areas. A study in Anambra state, Nigeria showed that the most preferred source of provision of malaria treatment services for the respondents was public hospitals followed by training of mothers, treatment in Primary Healthcare Centres, traditional healers and patent medicine dealers were the least preferred strategies for improving malaria treatment. Some of the preferences differed by socio-economic status and by a lesser extent, the geographic location of the respondents [39].

Another study in Anambra state, Nigeria [32, 33, 39] showed that urban-rural geographic differentials exist in access to malaria treatment services, increasing the vulnerability of the rural dwellers to consuming inappropriate treatment which is likely to worsen their disease burden. For instance, the pattern of drug use that was found in this study has equity implications for appropriate treatment of malaria in Anambra state and even Nigeria because the two main failing drugs were used more by rural dwellers.

Also, the low-level providers with low quality of services were also significantly and predominantly used more by the rural dwellers. These findings infer that the rural dwellers received lowest quality of treatment from all ramifications and current efforts in Nigeria to provide malaria treatment services do not address geo-graphic inequities in service delivery. It was therefore suggested that there should be re-invigoration of public facilities for appropriate diagnosis and treatment of malaria, in addition to improving the financial and geographic accessibility of such facilities.

The primary healthcare is the entry point into the Nigerian healthcare sector and is aimed at providing healthcare services to the grass root; however, use of primary health facilities as the first resort for malaria management is low. It is estimated that only about 20% of malaria episodes are treated in the health centres [5].

In order to cope with deficiencies in the performance of formal health services especially in the rural areas where malaria is most endemic, communities have resorted to self-medication through the unregulated private and informal sector [5]. However, most times they are required at these facilities to distinguish between anti-malaria and choose which one they want. Presently there are more than two hundred brands of ACTs in the Nigerian market, which can be bought over the counter [34] and community members usually do not have appropriate information on over-the-counter medicines, hence this has led to widespread ineffective treatment of fevers [12].

The private sector is also poorly regulated hence the administration of anti-malarial is often erratic. In both urban and rural areas the first source of treatment is usually from the Patent Medicine Dealers (PMDs) [24]. Previous studies have substantiated the critical role of these PMDs in malaria treatment, indicating that they serve as the first point of contact for care in more than half of the cases in rural Nigeria [27] They are readily available and their services apparently cheaper on the short run due to non-payment of consultation fees and transport costs [9].

However, concerns are being raised about their adherence to treatment guidelines, the appropriateness and quality of drugs that they provide as they usually do not have any formal training [9]. An in-depth study of PMDs in three Nigerian states revealed that relatively few of them were aware of the new government policy on anti-malarial drugs, Sulfadoxinepyrimethamine was the most common drug they stocked, followed by Chloroquine with ACTs being the least in stock and Monotherapy artesunate drugs were also common [27].

Generally, malaria treatment services and practices are still inadequate in both the public and private sector. From the demand side, cost is a major barrier to effective treatment [23]. Access to ACTs, is still constrained by cost as they cost much more than the previously used anti-malarial, with a dose averaging about 504 naira ($4) [27]. The high cost of ACTs often results in patients opting for a cheaper alternative or not buying the full regimen [28]. This is further compounded by lack of financial risk protection in Nigeria especially for the informal sector where the most poor belong. This means that even the poor pay out of pocket to receive treatment each time they have malaria which could be several times a year.

From the supply side the lack of adherence to treatment guideline and poor prescribing practices of providers are major constraints to proper treatment [27].

Other factors that influence provider treatment practices in other African settings include client expectations, expected profit margins, pharmaceutical company promotions, and local regulation [15]. Several initiatives have been put in place over the years to improve access to proper malaria treatment, including training of community health workers and Role Model Mothers (RMM) in treatment of febrile children with ACT. These community-based agents are trained to assist in administering drugs for fever as the availability of effective anti-malarial drugs at home is one way to ensure prompt access to treatment. Studies have also shown the feasibility of this method [5].

Some states in Nigeria have also abolished user fees for children under five and for pregnant women in public health facilities, in an effort to improve access to effective treatment. However, the policy also does not make any provision for the different socio-economic groups as there are many people outside of the target groups of pregnant women and children less than five years at risk of incurring catastrophic costs due to malaria. With the newly introduced high cost ACT, and the new WHO treatment guidelines, a policy option to improve diagnosis and prescribing pattern in private sectors will be to train PMDs in the appropriate use of RDTs and ACTs. It is likely to decrease inappropriate treatment and delay the emergence of resistance to ACT, while enhancing the delivery of ACT for malaria treatment.

Theoretical framework

This study is guided by Information Processing Theory. According to Anaeto and Anaeto (2010) cited in Asemah (2011) information processing theory was formulated by Williams J. McGuire in 1968. According to them, the theory holds that attitude change in an individual goes through six stages and every stage is important. The stages include the following: persuasive message must be communicated; the receiver will attend to the message; the receiver will comprehend the message; the receiver will yield to and is convinced by the argument presented; the new adopted position is retained and the desired behaviour takes place. However, for this study the most important stage is the ability of the receiver to comprehend the message. This stems from the ability of the anti-malaria drug user to understand the message contained in the leaflets and why he needs to accept it. The malaria patient tries to rationalise the message to provide evidences why the message should be accepted or rejected. This theory is apt for this study as it emphasizes the need why the communicator should ensure clarity when designing and presenting the message on the use of the anti-malaria drugs on the leaflets.

4. Methodology

This paper adopts the content analysis research design. According to Stambor (2005), Content Analysis is a technique for systematically describing written, spoken or visual communication. It provides a quantitative (numerical) description. Many content analyses involve media - print (newspapers, magazines), television, video, movies, the Internet. Any medium that can be recorded and reviewed is appropriate. Content analysis is also used to analyze new material recorded by the researchers, and to classify open-ended responses to interview or survey questions.

In this paper the manifest contents of the following Anti-malaria drugs will be content analyzed to determine the legibility of its contents, clarity of health risk messages, and relevance of its contents and usage of simple expressions for easy comprehension: Coartem, Artemether, Melotan, Laridox, Lumartem, Artesunate & Amodiaquine, Artemefan. The units of analysis that underscore this content analysis include: Description of Drug, Dosage, Side Effect, Storage as well as Contraindications. The content categories to be analyzed within the context of these units of analysis are: legibility of the manifest content of communication, clarity of health risk messages, relevance of message to consumers as well as the language use to aid easy understanding. This is presented in the table below:

S/N Units of Analysis Coding Categories Code Assigned 1 Name of Drugs Coartem Artemether Melotan Laridox Lumartem Artesunate and Amodiaquine Artemefan 01 02 03 04 05 06 07 2 Size of font size Legibility Clarity of message 01 02 3 Language English French 01 02 4 Visuals Text Dosage Side effects Illustrations Storage 01 02 03 04 05.

5. Data Analysis and Presentation

The data collected from the manifest content of communication of the leaflets of some selected anti-malaria drugs are presented in tables showing frequencies and percentages of each unit of analysis and content category based on the objectives of the study. Also, the qualitative data were also quantified using relatedness in themes or concepts.

Table 2: Distribution of data showing the different font sizes used in the leaflets of sampled anti-malaria drugs S/N Variables Font Sizes Below 6 points B/w 6 – 9 points Above 9 points F % F % F % 1. Lumartem - 0 6 100 - 0 2. Artesunate & Amodiaquine - 0 6 100 - 0 3. Artemefan 6 100 - 0 - 0 4. Laridox - 0 6 100 - 0 5. Melofan 6 100 - 0 - 0 6. Sanofi - 0 6 100 - 0 7. Coartem - 0 - 0 6 100

Table 2 (above) shows that there is uniformity in the use of font size in all the leaflets. All the six leaflets for the sampled anti-malaria drugs that make up the units of analysis were all presented with the same font size individually. The result shows that Coartem appears to be more legible with font size above 9 points; all the other sampled anti-malaria drugs had between 6 – 9 points, while Artemetan and Melofan leaflets had below 6 points which may have been informed by the size of their leaflets (i.e. they both had small paper size leaflet).

Table 3: Distribution of data showing the amount of white space and use of variation in each sampled leaflet of selected anti-malaria drugs

1. S/N Variables White Space Variation
2. Lumartem Enough white space There is variation
3. Artesunate & Amodiaquine Enough white space No variation
4. Artemefan Enough white space No variation
5. Laridox Enough white space No variation
6. Melofan Enough white space No variation
7. Sanofi Not enough white space No variation
8. Coartem Enough white space No variation In graphics of communication, white space and variation helps legibility of text.

From the result in Table 3 (above) all the sampled leaflets of the selected anti-malaria drugs had enough white space (especially between columns) except Sanofi which had limited white space. Also, all the anti-malaria drugs under investigation did not use variation, except Lumartem which used a darker background for the texts on drug description and dosage but a lighter background for the other units of analysis.

Table 4: Distribution of data showing clarity of message (in terms of font size) S/N Variables Clarity Status

1. Lumartem Clear
2. Artesunate & Amodiaquine Clear
3. Artemefan Not Clear
4. Laridox Clear
5. Melofan Not Clear
6. Sanofi Clear
7. Coartem Very Clear The scale of measurement for clarity of message was (very clear, clear, not clear) based on the font sizes used in each leaflet.

The result shows that Coartem had "Very Clear" message in terms of font size, all the other leaflets of selected anti-malaria drugs had "Clear" messages except Artemefan and Melofan which had "Not Clear" messages because their font sizes were below 6 points.

Table 5: Distribution of data showing language use in each leaflet of sampled anti-malaria drug S/N Variable Writing for Medical Experts Writing for all classes of Individuals F % F % 1. Drug Description 5 71 2 29 Associating Age with Dosage of Drug No Age indication on Dosage of Drug 2. Dosage 3 43 4 57 Associating Side Effect with Age of Patient No Age Indication on Side Effect of Drug 3. Side Effect 1 14 6 86 "Keep out of the reach of children" Indicated "Keep out of the reach of children" Not Indicated 4. Storage 6 86 1 14 Writing for Medical Experts Writing for all

classes of Individuals 5. Contraindication 5 71 2 29

The result in Table 5 (above) is a quantitative representation of the various qualitative data drawn from the leaflets of the sampled anti-malaria drugs. The result reveals the use of language in communicating meaning to patients about anti-malaria drugs. On the drug description and contraindication 5 (71%) of the sampled drug leaflets used Jargons known only to medical experts, while 2 (29%) used simple expression to explain the technical terms used which communicates to various classes of individuals. Also, language use on dosage of drug showed a preponderance of information (57%) not associating dosage with age of patients but used weight range which an average patient may not be able to interpret easily. On the other hand, 3 (out of the 7) sampled leaflets used age of patient in association with dosage of drugs for easy comprehension.

On the Side Effect of drugs, most of the drug leaflets 6 (86%) did not associate any side effect to particular age of patients; only 1 (14%) did so, which enables patients know the particular side effect peculiar to people of his/her age. Most of the drug leaflets (86%) stated in their storage information that drugs should be kept "out of the reach of children" but only 1 (14%) did not state so. The study also found that there was no pictorial representation of information on the temperature for storing drug. In all, two of the sampled drugs (i.e. Coartem and Sanofi) used both English and French in communicating risk information of drugs.

Discussion of Findings According to the National Academy Press (NAP) (1989) any drug content that must effectively communicate its risk information must address the following issues that have been the source of difficulty in communicating risk information. They are: audience orientation, uncertainty, risk comparison and completeness of information. Legibility of message content is a major determinant of the fulfillment of every other requirement. The findings from this study (i.e. Tables 2 and 3) reveal that 2 (out of the 7) sampled drug leaflets were not legible enough (i.e. less than 6 point font size). Hence, patients are not likely to get the risk information contained in the leaflet. This finding agrees with [16] who raised concerns about the problem of adherence to treatment guidelines due to poor legibility of the messages in the leaflets of the anti-malaria drugs. Similarly, the use of white space and variation in layout is another element that aids legibility of message content; 2 (out of the 7) sampled drug leaflets also fell short of this requirement.

The clarity of message content is also aided by completeness of information and relating the message to the audiences' perspectives. The information provided must be relevant to the practical actions that individuals can take. Hence, not associating information about "dosage" and "side effect" of drugs with age of patients (as found in Table 5) makes the message incomplete and unable to help the patient take necessary practical health actions. This finding is con-

sistent with the thoughts of [12] and [34] who argued that although there are several brands of ACTs in Nigerian markets however; community members do not have proper information as to how to use them as a result of ineffective communication.

Furthermore, NAP (1989, p. 32) posit that risk information must be couched in clear and plain language; respect the audience and its concerns and seek to inform the recipient, unless conditions clearly warrant the use of influencing techniques (i.e. medical jargons). This study found that Coartem and Sanofi drug leaflets met this condition by providing explanations to medical jargons used in drug description and contraindications of drug. Meeting the condition of "Uncertainty" as pointed out by NAP (1989), information on drug leaflet must address the state of ignorance of patients.

It would be costly assumption to believe that the average patient knows about issues like "adverse drug reaction", "drug description" or "temperature for storing drugs" etc. Hence, these things must be properly explained in the leaflets of anti-malaria drugs to reduce drug abuse or indiscriminate administration of drug. This is because the medical experts may not always be there to guide the patient especially in rural areas. This concern is captured in the work of Onwujekwe et al., (2010) where it was observed that there is a disparity between urban rural access to and understanding of messages contained in the anti-malaria drug leaflets as to dosage and storage due to the technicalities of the words used.

On the other hand, Lumartem anti-malaria drug was found to be the only drug (among the sampled drugs) that addressed the difficulty of risk comparison by associating age of patient with possible side effect of the drug. The completeness of health risk information in the leaflet of anti-malaria drugs is sine-qua-non to easy comprehension. Once there is ambiguity in communicating health risk information, understanding becomes difficult and patients are not properly guided to take practical health actions. Conclusion Based on the findings from the study, the researchers hereby conclude that anti-malarial drugs have an important role to play in reducing malaria transmission and in curtailing the spread of drug resistant parasites. However, problems associated with understanding health risk information as regards audience orientation, uncertainty, risk comparisons, and completeness of health risk information in areas of drug description, dosage, and side effect, storage and contraindications demands urgent attention.

Recommendations

1. There should be a standard font size and type to be used when designing and presenting messages on anti-malaria drugs to ensure uniformity, legibility and clarity of instructions with ease of language for readability.

2. Technical words should be avoided when presenting these messages in order to accommodate all class of persons with low education and with an inclusion of native language of the huge population that consume the drugs in the communities.

3. The side effects of anti-malaria drugs should be properly stipulated and the ages of potential consumers and users of the drugs.

4. Those who design the anti-malaria drugs leaflets should take into cognizance proper use of elements of graphic designs for effective communication.

References

1. Adams J. (1995). Risk. New York: Routledge.

2. Adeneye AK, Jegede A, Mafe AM, Nwokocha EE. "Community perceptions and home management of malaria in selected rural communities of Ogun state, Nigeria". International Journal of Malaria Research and Reviews. 2013; 1: 22–34.

3. Adjah EO, Panayiotou AG. "Impact of malaria related messages on insecticide-treated net (ITN) use for malaria prevention in Ghana. Malaria" Journal. 2014; 13: 123.

4. Africa Fighting Malaria, (AFM). (2010). "Private sector and public sector malaria treatment in Africa": The challenge of getting the best drugs into the hands of the people who need them. 2008. Accessed online on 19th March, 2010.

5. Ajayi I, Falade C, Bamgboye A, Oduola A, Kale O. "Assessment of a treatment guideline to improve home management of malaria in children in rural south-west Nigeria": Malaria Journal. 2008; 7: 24.

6. Odedina SO, Falade CO, Ajayi IO. "Knowledge and utilization of intermittent preventive treatment for malaria among pregnant women attending antenatal clinics in primary 40. health care centers in rural southwest, Nigeria": a cross-sectional study. BMC Pregnancy and Childbirth. 2009; 9: 28.

7. Army Corps of Engineers (2013). http://corpsriskanalysisgateway.us/riskcommunication.cfm (revised November 30, 2012; accessed August 16, 2013).

8. Asemah ES. "Selected Mass Media Themes". Jos: Jos University Press. 2011.

9. Asenso-Okyere W, Anum A, Osei-Akoto I, Adukonu A. "Cost Recovery in Ghana: are there any changes in health seeking behaviour?" Health Policy and Planning. 1998; 13: 181- 8.

10. Conteh L, Stevens W, Wiseman V. "The role of communication between clients and health care providers: implications for adherence to malaria treatment in rural Gambia". Tropical Medical International Health Journal. 2007; 12: 382–91.

11. Don de S, Charles M, Eleuther M, Honorati M, Abdulatif M, Yahya M, et al., "Care-seeking patterns for fatal malaria in Tanzania". Malaria Journal. 2004; 3: 27.

12. Osagie W. "Management of Malaria by Medicine Retailers in a Nigerian Urban Community". Journal of Health & Population in Developing Countries, 2004.

13. Federal Republic of Nigeria, Federal Ministry of Health. A strategy for behaviour change communication Abuja, Nigeria. 2008.

14. Federal Republic of Nigeria, Federal Ministry of Health. "National malaria control programme strategic plan Abuja, Nigeria". 2009–2013 Federal Republic of Nigeria. National Population Commission (NPC) (2010). Nigeria malaria indicator survey Abuja, Nigeria. 2013.

15. Goodman C, Brieger W, Unwin A, Mills A, Meek S, Greer G. Medicine Sellers and Malaria Treatment in Sub-Saharan Africa: What Do They Do and How Can Their Practice Be Improved? Am. J. Trop. Med. Hyg. 2007; 77: 203- 18.

16. Hanson K, Goodman C, Lines J, Meek S, Bradley D, Mills A. The economics of malaria control interventions. Geneva:Global Forum for Health Research. 2004.

17. Jimmy EO, Echelonu E, Orji S. Antimalarial dispensing pattern by patent medicine dealers in rural settlements in Nigeria. Public Health. 2000; 114: 282- 5.

18. Malaney P, Spielman A, Sachs J. The Malaria Gap. Am J Trop Med Hyg. 2004; 71: 141–6.

19. Mangham J, Cundil B, Ezeoke O, Nwala E, Uzochukwu BSC, et al., "Treatment of uncomplicated malaria at public health facilities and medicine retailers in south-eastern Nigeria". BMC Public Health. 2011; 10: 155.

20. Mazumdar P, Mazunmdar S. Prevention and treatment of malaria in Nigeria: Differential and determinants from a spatial view. 2007.

21. Nag B. Mass media and ICT development communication: Comparison and convergence. Global Media Journal. 2011; 2: 1–29. National Academy Press (NAP) (1989). Improving Risk Communication. Committee on Risk Perception and Communication, National Research Council, ISBN: 0-309-56832-3 pp 1 – 353.

22. National Research Council. "Improving risk communication". Washington, D.C.: National Academy Press. 1989; p. 21.

23. Nwankwo LO, Nwaiwu O, Ezeora AC, Onnoghen NA. "Role model mother/caregiver programme to expand home-based management of malaria with artemetherlumefantrine in Nigeria". Nigerian Medical Practitioner. 2014; 65: 69–74.

24. Nyamongo IK. "Health care switching behaviour of malaria patients in a Kenyan rural community". Social Science and Medicine. 2002; 54: 377- 86.

25. Okeke T, Okafor H. "Perception and Treatment Seeking Behavior for Malaria in rural Nigeria: Implications for Control". Journal of Human. Ecology. 2008; 24: 215- 22.

26. Okeke TA, Uzochukwu BSC. "Improving childhood malaria treatment and referral practices by training patent medicine vendors in rural south-east Nigeria" Malaria Journal. 2009; 8: 260.

27. Okeke TO, Uzochukwu BSC, Okafor HU. "An in-depth study of patent medicine sellers' perspectives on malaria in the rural Nigerian community". Malar J. 2006; 5: 97.

28. Oladepo O, Kabiru S, Adeoye BW, Oshiname F, Ofi B, Oladepo M, et al., "Malaria treatment in Nigeria: the role of patent 42" Medicine vendors. 2008.

29. The Future Health Systems. "Innovations and knowledge for future health systems for the poor". Policy Brief March Journal. 2008. 1:5 43.

30. Olorunfemi EA. "Impact of health education intervention on malaria prevention practices among nursing mothers in rural communities in Nigeria". Nigeria Medical Journal. 2013; 54: 115–22.

31. Onwujekwe O, Uzochukwu B, Dike N, Uguru N, Nwobi E, Shu E. "Malaria treatment perceptions, practices and influences on provider behaviour: comparing hospitals and non-hospitals in south-east Nigeria". Malar J. 2009; 8: 246.

32. Onwujekwe OE, Ojukwu J, Uzochukwu B, Dike N, Shu E, Ikeme A. "Where do people from different socio-economic groups receive diagnosis and treatment for malaria in southeast Nigeria?" Ann Trop Med Parasitol. 2005; 99: 473–81.

33. Onwujekwe O, Chime R, Okonkwo P. "Economic burden of malaria illness versus that of a combination of all other illnesses": A study in five malaria holo-endemic communities. Health Policy. 2000; 54: 143–59.

34. Onwujekwe O, Hanson B, Uzochukwu B, Ichoku H, Ike E, Onwuaghalu B. "Are malaria treatment expenditures catastrophic to different socio-economic and geographic groups and how do they cope with payment?" A study in southeast Nigeria. Tropical Med Int Health. 2010; 15: 18–25.

35. Onwujekwe O, Hanson K, Uzochukwu B, Ezeoke O, Eze S, Dike N. "Geographic inequities in provision and utilization of malaria treatment services in southeast Nigeria": Diagnosis, providers and drugs. Health Policy. 2010; 94: 144-9.

36. Palafox B, Patouillard E, Tougher S, Goodman C, Kara H. ACT watch: evidence for malaria medicine and policy. Outlet Survey Report (Baseline), Nigeria. 2009.

37. Reynolds B, Seeger MW. "Crisis and emergency risk communication as an integrative model". Journal of Health Communication. 2005; 10: 43-55.

38. Salako LA, Brieger WR, Afolabi BM, Umeh RE, Agomo PU, Asa S, et al., "Treatment of childhood fevers and other illnesses in three rural Nigerian communities". Journal of Tropical Pediatrics. 2001; 47: 230-8.

39. Sandman P. "Risk communication in Encyclopedia of the Environment" (Ruth A. Eblen and William R Eblen, eds.) Bos-ton, MA: Houghton Mifflin. 1994; pp. 620-623.

40. Stambor Z. "Emotionally loaded topic may impair speech". Monitor on Psychology. 2005; 36: 6.

41. Uguru NP, Onwujekwe OE, Tasie NG, Uzochukwu BS, Ezeoke UE. "Do consumers' preferences for improved provision of malaria treatment services differ by their socio economic status and geographic location"? A study in southeast Nigeria. BMC Public Health. 2010; 10: 7.

42. United States Agency for International Development (USAID). "President's malaria initiative". A malaria in pregnancy case study:

Senegal's successes and remaining challenges for malaria in Pregnancy programming. 2011.

43. United States Agency for International Development/Tanzania. COMMIT project performance evaluation. 2012.

44. Communication and Malaria Initiative in Tanzania. 2012.

45. Whitty C, Allan C, Wiseman V, Ochola S, Nakyanzi-Mugisha M, Vohn, B, et al., "Averting a malaria disaster in Africa- where does the buck stop. Bulletin of the World Health Organization". 2004; 82: 381- 4.

46. Wiseman V, Mangham LJ, Cundill B, Achonduh OA, Nji AM, Chandler C, et al., "A cost effectiveness analysis of provider interventions to improve health worker practice in providing treatment for uncomplicated malaria in Cameroon": a study protocol for a randomized controlled trial. Trials journal. 2012; 13: 4.

47. World Health Organization (WHO). "The roll back malaria strategy for improving access to treatment through home management of malaria". World health organization. Geneva. 2005.