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Knowledge and Perception of Diphtheria Vaccine Messages on Radio among Residents of Ungogo Local Government Area, Kano State

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Abstract

The re-emergence of diphtheria has become noticeable in Nigeria particularly in Kano state. This study assessed the knowledge level and perception of diphtheria vaccine messages on radio among residents of Ungogo Local Government Area, Kano State. To achieve this, the study employs survey method to quantify the knowledge and perception of the population of study.400 questionnaires are administered and nothing less than 390 are retrieved in both Rijyar Zaki and Tudun Fulani communities. The findings revealed that the residents had knowledge of diphtheria vaccine and radio remains the most important medium for disseminating diphtheria vaccine messages in Ungogo Local Government Area, Kano State. However, about 58.9 percent agreed that diphtheria vaccine is only necessary for children. 66.6 percent agreed that diphtheria vaccine message increased their confidence on the safety and efficacy of the vaccine. Frequency distribution tables are used to present and anlayse data generated from the field. The results of the study showed that the residents perceived diphtheria vaccine messages positively but 33.3 percent did not discuss about diphtheria with their friends, families and community members.

Keywords
Diphtheria, Knowledge, Messages, Perception, Radio and Vaccine

I. Introduction

Historically, diphtheria has been one of the most prevalent infectious diseases in the world, primarily affecting children and creating devastating epidemics with high case-fatality rates (World Health Organisation, 2017). Acosta et al (2021) state that Hippocrates first reported the disease in the fifth century BCE, while Aetius first detailed epidemics in the sixth century AD. Edwin Klebs made the initial observation of the bacteria in diphtheritic membranes in 1883, and Friedrich Löffler cultivated it in 1884. Prophylaxis using toxin-antitoxin combinations was attempted in the early 1900s. The early 1920s saw the development of diphtheria toxoid, but it was not until the early 1930s that it was widely utilized. The 1940s saw its routine use in conjunction with the pertussis and tetanus toxoid vaccines (Ahmed & Msughter, 2022).

Clarke et al., (2019) reported that globally cases of diphtheria have declined with the introduction of a vaccine in the 1950s with a great success recorded in high-income counties. The number of diphtheria cases decreased from more than 1,000,000 cases per year in the pre-vaccine era to an average of 6,582 cases between 2013 and 2017. In addition, the global burden appears to have reduced significantly, with outbreaks in Russia in the early 90s and a series of outbreaks documented in India, Vietnam, Nepal, Indonesia, and parts of Africa, including Nigeria.

According to the Global Health Observatory, reported cases of diphtheria from 1970-2019 have been confirmed 39,895 and there no cases were reported in 2022. The Nigeria Center for Disease Control reported 160 cases of diphtheria in Nigeria in 2021. Most of the cases were reported in the northern part of the country including Kano, Bauchi and Yobe states with the highest number. Other states with reported cases include Borno, Gombe, Jigawa, Kaduna, Katsina, Kebbi, Sokoto and Zamfara. In Kano state, the majority of the cases were reported in Kumbotso, Gwale and Tarauni local government areas. In Bauchi state, the majority of the cases were reported from Bauchi, Ganjuma and Tafawa Balewa local government areas and in Yobe state, majority of cases were reported from Damaturu, Fika and Potiskum Local government areas. In 2020, there were 245 reported cases from 25 states of the country; the highest numbers of cases were reported in the Northwest region of Nigeria with Katsina and Kano states recording the highest number of cases. Other states with a significant number of cases included Jigawa, Sokoto, Zamfara and cases were also reported across the country including the southern state.

In recent times, infection of diphtheria is on the rise, as of 3rd December 2023, the cumulative report from Epidemiology week 19,2022 to week 48,2023, there were a total of 20, 684 suspected cases of diphtheria in Nigeria. Kano has the highest number of suspected cases totaling 13,461. According to the Chief of UNICEF field Office, Kano, Mr.Rahma Farah said Ungogo Local Government Area had the highest number of diphtheria cases in the State (Msughter, 2020). Containing the disease, in December 2022, NCDC activated a multisectional national diphtheria emergency operations centre in coordinating surveillance and response activities across the country. To address the information disorder, NCDC partnered with other agencies like AFENET, BA-Nigeria and John Hopkins Centre for communication programmes in pioneering media-epidemiology fellowship with the view to train media professionals on public health issues (Aondover et al., 2022).

Diphtheria is a bacterial upper respiratory disease with high mortality in young children (Byrne, 2008; Aondover et al., 2024). NCDC (2023) described diphtheria as a serious bacterial infection that affects the nose, throat and sometimes, the skin of an individual. It manifests as laryngitis, pharyngitis or tonsillitis and is associated with the presence of an adherent membrane covering the tonsils, pharynx and the nose. The outbreak of diphtheria occurs the world over. However, in countries where effective childhood immunization programs have been implemented, dramatic reductions in diphtheria morbidity and mortality have resulted (Aliough et al., 2023).

Hafsat Jaffar, 30, a mother of six who bury three of her children due to diphtheria in her semi-completed house located in Dawanu community in Ungogo Local Government Area of Kano state.According to a report by The Cable (2023) Jaffar did not have knowledge of diphtheria. She said three of her children Khadija, 2, Ahmed, 4 and Khairat 8 were shouting 'wayyo Allah (oh Allah) pointing at their throats and complaining of fever. The following morning, she rushed them to Waziri Gidado Hospital to report what was happening. As communication gaps deepen diphtheria vaccine hesitancy, it is imperative to fill the existing gap in the body of knowledge. This study examines the knowledge and perception of diphtheria vaccine messages among residents of Ungogo Local Government Area, Kano state.

1.1 Problem Statement

Cooper et al., (2018) state that vaccination programmes in African countries are challenged by vaccine hesitancy which represents a continuum between vaccine acceptance and refusal. MacDonald (2015) is of the view that insufficient information about immunisation programmes can lead to vaccine hesitancy and outright refusal in high-income nations with well-resourced vaccination programmes. Vaccine hesitancy is one of the problems fueling the spread of infectious diseases in Nigeria. Like other infectious disease, for years, polio vaccination has faced strong resistance among conservative Islamic communities in northern Nigerian communities, largely due to a deep distrust of the West, persistent rumours that the vaccine is harmful, and the house-to-house approach taken by immunization campaigners, which many saw as intrusive.

According to a report by Voice of America (2023) reported that a local radio aired claims made by two mothers that their children developed kidney complications after diphtheria vaccines bring old safety fears to the region. There have been lots of speculations in Kano state which have contributed significantly to the diphtheria vaccine hesitancy in the state. Claims reported by local radio and cultural beliefs and communication gap are central to the subject matter. This study aims to fill the existing gap by assessing the knowledge and perception of diphtheria vaccine messages among residents of Ungogo Local Government Area, Kano state.

1.2 Objectives of the study

The aim of the study is to find out the level of knowledge and perception of diphtheria vaccine messages on radio among residents of Ungogo Local Government Area, Kano state.
The objectives are:

1. To find out the knowledge level of diphtheria vaccine messages among residents of Ungogo local government area, Kano State.
2. To study how residents of Ungogo Local Government Area, Kano State perceive diphtheria vaccine messages.
3. To examine the impact of diphtheria vaccine messages among residents of Ungogo local government Area, Kano State.

1.3 The Concept of Knowledge

The term “knowledge” has many different definitions. Foskett in Airaoje et al., (2024) defines knowledge as '“what I know, information is what we know.” Stonlier (1990) defines knowledge as “an organised information in people's heads. Drawing on the inadequacies of this definition, Bates in Airaoje et al., (2023) points out that knowledge is information given meaning and integrated with other contents of understanding. Therefore, he argues that knowledge has extra layer of understanding which deals with information, thought and perception. Similarly, some scholars see knowledge as organised information that changes something or somebody which either form the foundations for actions or by creating an individual (or an institution) capable of different successful action. Dixon (2000) defines knowledge “as the meaningful links people make in their minds between information and its application in action in a specific setting. Davenport 1997 summed it up “Knowledge is essential for the solution of problem and decision-making, because it belongs stronger meaning than data and information.”

Knowledge is also theoretically grounded in the field of epistemology. It is a branch of philosophy that deals with the study of knowledge. Bolisani and Bratianu in Airaoje et al., (2024) reported that Plato came up with a profound conceptualisation of knowledge saying that knowledge entails the justification of truth and belief. This definition was perceived to be

problematic though it has overwhelming theoretical supports. Neta and Pritchard (2009) re-affirm Plato's conceptualisation by identifying three conditions of knowledge.

Knowledge is a constant formed by interlinking q spectrum of intellectual components and the simplest being information (Aondover et al., 2025). Knowledge is defined as information gained and remembered through a learning process. Admittedly in an attempt to carefully examine the phenomenon or factual information or data stored in order to ascertain the justification of true belief is labelled “Knowledge Gap”. The knowledge gap exists as a result of differences in the types of knowledge being studied.

1.4 The Concept of Perception

Ngene in Msughter and Phillips (2020) defines perception as the ability of a person to take intellectual cognizance of, to apprehend by the mind, to be convinced of by direct intuition, to note, to remark, to discern, see or to understand. Osuagwu (2020) observed that perception is the procedure in which humans interpret the sensory data, which are generated from human’s five senses. These definitions have most obviously shown that sensory organs are central to the process of perception. Feldman in Ngene (2016, p. 64) states that “Perception is the sorting out, interpretation, analysis and integration of stimuli involving our sense organs and brain.”

In other words, perception is conceived and regarded as a form of communication. Based on what people feel, experience, see, read, hear or talk about, they often make evaluative judgments of what is desirable and undesirable in a society or community. It is imperative to note that peoples‟ beliefs and values are shaped by their perception of the world in which they live. Their thinking and beliefs also determine their opinions and attitudes, motives, issues, events and the society at large.

Berelson and Steiner in Msughter et al., (2022) state that perception is the "complex process by which people select, organize and interpret sensory stimulation into a meaningful and coherent picture of the world" (p. 88). This definition brings out the active role that a person plays in perception. The person doing the perceiving brings something to the act of perception, just as does the object being perceived. Putting it another way, perception is influenced by a number of psychological factors, including assumptions based on past experience (that often operate at an almost unconscious level), cultural expectations, motivation (needs), moods, and attitudes. A number of experiments have demonstrated the effects of these factors on perception.

Perception involves two types of influences namely: structural influence and functional influence. Structural influence is the direct influence on perception as derived from the physical exposure to certain stimuli. While functional influence arises from indirect factors like belief system and other variables that influence exposure and introduce bias (Namadi & Aondover, 2020). The process of receiving and interpreting a message is referred to in many communication models as decoding. The process involves perception, or the taking in of information through the senses, an area that psychologists have studied in considerable detail. Before we consider the operation of perception in the decoding of a mass communication message, we will discuss some of the research findings about perception in general.

Modern psychology has shown perception to be a complex process, and rather different from the naive view that many people probably had a century ago. This old view—which we might refer to as the common-sense view— saw human perception as largely a physical or mechanical process. The human eye and the other sense organs were thought to work much like a camera, or a tape recorder. This view of perception held that there was a quite direct correspondence between an "external reality" and a person's perception, or what

was in the mind. This view would hold that everybody perceives the world in essentially the same way. Psychologists have found perception to be a more elaborate process than that. The process of receiving and interpreting a message is referred to in communication models as decoding. The process involves perception or the taking in information through the senses an area that psychologists have studied.

Individual can have vastly differing interpretations of the same situation. Whilst all human beings receive information through the same five organs/senses, vision learning, smell, taste and touch. The extent to which they attend to a piece of information and how information is interpreted tends to differ. It differs because perception is a product of three variables. Public perception of health information can help to give insight into the effectiveness of the campaign. Public perception is very important in health campaigns as it may lead to the identification of areas that need to be modified and it can either be positive or negative (Obada et al., 2024). The manner at which people perceive health programmes on radio may or may not elicit the required response to the messages especially in this digital dispensation where there is information overload in the internet as well as the internet radio which is embellished alongside news with music, text, graphics, speech format and video.

1.5 Perspective on Diphtheria Vaccine Messages

The diphtheria communications interventions through a collaborative Russian-American program involving BASICs (a project funded through the United States Agency for International Development), the Russian Ministry of Health and the former State Committee for Sanitary and Epidemiologic Surveillance. The actual implementation of communication activities was carried out by public health agencies involved in diphtheria control efforts in Novgorod City, Voronezeh Oblast and City of Yekantembug in Russia. The emphasis was on using local media especially, radio and television to inform adults of the need for second and third doses of tetanus-diphtheria vaccine and to positively influence the general attitude toward diphtheria vaccination (Obada et al., 2021). The team carried out formative research in Oblast which indicates that adults saw diphtheria as a potentially serious disease but not as a very immediate, personal threat. Respondent felt no great urgency regarding the need to take preventive measures.

Positive attitudes towards immunization were undermined by nagging concerns concerns about vaccine efficacy and service quality, combined with some statement toward the more corrective aspect of immunization program (Obada et al., 2021). People also expressed skepticism regarding the competency of medical personnel, fueled in part by previous publicity on the negative side effect of vaccines and an apparent shift in diphtheria immunization policy (emphasizing the importance of second and third doses)

1.6 Brief History of Radio in Nigeria

The history of broadcasting can be traced to 1888 when Heinrich Hertz produced the first radio wave to confirm the earlier theory propounded by the British scientist, James Clark Maxwell that the creation and communication of electromagnetic wave was possible. Radio broadcasting came as the first form of broadcasting in Nigeria in the year 1932. It was conceived by the auspices of the Post and Telegraphic Departments which was relaying programmes from the British Broadcasting Corporation (BBC) empire service. The relay station was set up in Lagos and after a year the station commenced experiment with the re-diffusion service (Pate et al., 2022).

The plan which materialised the distribution of programmes to subscribers in Lagos,Kano and Ibadan. In 1936, radio made its debut when the first radio distribution service (re-diffusion) was established as a means of distributing programmes originating from

the BBC London as part of the overseas services between 1940s through the mid-1950s re-diffusion became the principal mode of broadcasting in Nigeria and many people subscribed to the programme. Sometimes in 1945 during the Ten-Year Development Plan by the colonial administration, efforts were made to stabilise radio service in Nigeria but due to financial reasons they did not product useful results. Further progress was, however, made three years later when the Colonial Office invited the British Broadcasting Corporation (BBC) which is one of the most revered broadcast stations to carry out a survey on the possibility of broadcasting in the four British Colonies in West Africa: Nigeria, Ghana, Sierra-Leone and the Gambia. This led to the appointment of a two-man committee of Messrs L.W. Turner and F.A.W Byron in 1949.

The Turner-Bryon report was received in Nigeria January 1950 and was put under scrutiny for six months. The government accepted the report in the main, and created the Department of Broadcasting with effect from April 1,1951 and provided the equivalent of N669,800 for the overall capital development (Usman et al., 2022). Broadcasting came to Nigeria in two stages. The first was the introduction of wired broadcasting, popularly called "radio distribution" or "rediffusion". The Radio Distribution Service (RDS) was commissioned on Sunday December 1, 1935 to relay BBC programmes to about 500 subscribers. The second stage started on April ,1957 when the Nigerian Broadcasting Corporation (NBC) was decreed into existence.

The Nigeria Broadcasting Services (NBS) was formerly formed in April 1st 1951 after the federal government has decided to convert the major existing re-diffusion stations into fully operative radio stations. The broadcasting house was erected at Ikoyi, Lagos in 1954. The NBC was severely attacked by the Nigerian public and the press for being a government apparatus. The nation wanted the NBC to be impartial and to reflect divergent views, in addition to reflecting the cultural set up of the nation (Kurfi et al., 2021).

The motion was sponsored by a member of the Federal House of Parliament, Late Alhaji D.S Adegbenro on August 23rd, 1954 and 1st April, 1957 for the introduction and conversion of the NBS to Nigerian Broadcasting Corporation (NBC) respectively. The ordinance created both Federal and Regional Board of Governors. The function of both were identical. The former western region set up its own radio in May 1960 and called it the Western Nigeria Broadcasting Services. It went on air, on 1st October 1960 to coincide with Nigeria's political independence.

In 1962, the Northern Regional Government set up its own and called it Broadcasting Corporation of Northern Nigeria. The station was named Radio Television Kaduna. In 1977, the federal Government decided to take over all the existing regional stations and merged them with station in Lagos to form the Federal Radio Corporation of Nigeria (FRCN). FRCN is the only radio station in Nigeria that enjoys a nation-wide coverage. In April 1977, the corporation started the first FM STEREO broadcasting channel in Lagos at Radio Nigeria. The corporation ever since has been in the forefront of radio broadcasting in Africa (Msughter et al., 2023).

Currently, FRCN has numerous sub-stations in different states of Nigeria. Following president Obasanjo's review of the NBC policy in 2003, several of the corporation's AM stations were converted to FM station. Some of which include COAL CITY FM (Enugu) Paramount FM (Abeokuta), Heartland FM (Owerri), Treasure FM (Port Harcourt) and others. FRCN's headquarter is now situated in Abuja, the corporation also undertakes in foreign broadcasting for Nigerians and foreign audiences' resident abroad. That arm of FRCN is called voice of Nigerian (VON).

II. Review of Literature

2.1 Theoretical Framework

This study adopted the Knowledge Gap, and the Perception Theory. The concept of the knowledge gap was initially proposed by Tichenor, Donohue, and Olien at the University of Minnesota during the 1970s. These researchers posited that the increase in information within society is not uniformly acquired by all members of society. People with higher socioeconomic status tend to have a greater capacity to acquire information. This results in the formation of two distinct groups: one consisting of individuals with higher levels of education who possess more knowledge on a broader range of topics, and the other consisting of those with lower levels of education who possess less knowledge. Individuals with lower socioeconomic status, as determined in part by educational attainment, have limited or no knowledge of public affairs issues, are disconnected from current events and significant discoveries, and typically show little concern about their lack of knowledge.

The research conducted by this team focused on the function of news media in smaller urban areas, such as cities and towns, which they viewed as subsystems within larger state and regional social systems. Their work began with an empirical investigation into the systematic manner in which news media disseminates information to different segments of the population. Specifically, they discovered that individuals in higher socioeconomic groups tend to be better informed than those in lower socioeconomic groups. Over time, this knowledge gap between the two groups tends to widen. To support their theory, the research team conducted numerous surveys over the course of twenty-five years.

The knowledge gap perspective provides a compelling idea for understanding cognitive effects of message through a theoretical framework that can accommodate traditional one-way mass media as well as two-way telematic systems. Tichenor, et al., (1970) originally advanced the "knowledge gap hypothesis" to illustrate how differences in socioeconomic status among audience members can generate knowledge gaps between and among segments of society. They explain: As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease.

There are two main aspects of the knowledge gap hypothesis. On the one hand, it assumed that knowledge would be distributed between and among social classes. On the other hand, for specific subjects or topics, some people may be better informed than others (McQuail, 2010, p. 489). The first gap "is likely to have roots in fundamental social inequalities, which the media alone cannot modify". For the second, "there are many possibilities for opening and closing gaps and it is likely that the media do close some and open others. A number of factors can be named as relevant to the direction of media effect". Most early inquiries about knowledge gap focused on the relationship between education levels as a proxy for socioeconomic status and levels of knowledge. However, a number of studies also addressed the roles of motivational factors. The knowledge gap can result in an increased gap between people of lower and higher socioeconomic status. The attempt to improve people's life with information via the mass media might not always work the way this is planned. Mass media might have the effect of increasing the difference gap between members of social classes.

Ettema and Kline (1977) were among the early critics of the knowledge gap perspective. Although their critiques were directed at the same target, a closer analysis of their models, units of analysis, and assumptions revealed that they differed from those of the Minnesota Team, leading to distinct hypotheses and explanations. The Minnesota Team, on

the other hand, conducted a comprehensive research program that spanned nearly three decades and focused on the social stratification of collectivities, particularly communities, as the cause of knowledge gaps. This perspective viewed knowledge gaps as resulting from social control processes, with knowledge control by elites and/or pressures for social change as potential outcomes.

In 1977, Ettema and Kline focused on social-psychological factors, individual-level causative factors, audience-related components (talent, drive, media behavior), and message-related components (ceiling factors) to explain knowledge differentials as "communication effects gaps," using "differences" as an alternative to "deficits." Darvin's (1980) model was an intra-individual model of cognitive processing that included components of library science and cybernetics. She characterized data on gaps as "numeric myths" with a "blame the victim" perspective. She viewed the argument in terms of "information gaps" and "sense-making," and the "gap-bridging instance" served as her unit of analysis.

Knowledge gap theory serves as the framework for guiding the research study. It helps to understand the audience segmentation. This is because people with social economic status tend to receive messages publicized by the media at a slow rate and to understand the nature of gap that exists between people in the rural areas and those living in the cities. Perhaps, research has shown that radio is cost-effective and affordable yet there is an existing gap between those that are well informed and those that are less informed of media content. Relating to the subject matter, knowledge is an independent variable in the topic and it forms the basis for the research in ascertaining the factors that contribute to knowledge gap about diphtheria vaccines.

The Perception Theory was propounded by Berelson and Steiner in 1964. The theory explains the complex role of sense organs in people's behavioural responses to issues (Osuagwu, 2020). They argue that humans are endowed with senses (perceptual) organs (eyes, ears and nose) to help them recognize and process information in the environment, and such organs serve as inputs to the brain for information processing. The exponents see perception as the complex process by which people select, organise and interpret sensory stimulations into a meaningful and coherent picture of the world (Anaetoet al., 2008). Osuagwu (2020) observed that perception is the procedure in which humans interpret the sensory data, which are generated from human's five senses. These definitions have most obviously shown that sensory organs are central to the process of perception. This perhaps finds explanation in the selective processes or the selectivity t which holds that people expose themselves to certain messages, while shielding themselves from the other information. The selectivity elements are usually listed as exposure, perception and retention.

Baran and Davis (2016) observed that the minimal media effect research focused largely on the experimental variables such as perception, exposure, attention and retention. They argue that the proponents of this theory underestimate the power of the media as well as ignoring reinforcement and other forms of media influence. The major limitation of perception theory stems from that fact that the study appreciates the human sensory organs over the power of the media. It is just microscopic research studying mass communication phenomenon; the main point is that the activities in the social system are interdependent. Even to a larger extent media tend to influence the audience in taking informed decisions on health (Hile et al., 2023).

This theory helps guide the research study to understand how the public process information on diphtheria vaccine messages. It also highlights the several processes involved in decoding messages from media sources. The selectivity processes and how these steps play key role in mass communication. Therefore, the perception theory provides the linear stages

of processing information and help to ascertain the main media source through which the population of the study receives diphtheria vaccine messages and their media preferences.

III. Research Methods

The study adopts survey as the primary method of data generation. This method is used in social and behavioural sciences to ascertain the perception, attitude, beliefs, values, opinions and characteristics of a clearly conceived and defined population. Its goal is to provide a comprehensive and generalised proposition about human disposition (Wimmer & Dominick, 2011). According to the National Bureau of Statistics (2010), Ungogo local government area of Kano State has the total population of 365,737. This was recorded during the 2006 national population census. The male accounted for 192,372 and female totaled 173,365 which signaled that male resident are more than their counterparts. More importantly, the study purposively selects Ungogo local government because according to the Chief of Unicef Field, Kano, Mr. Rahama Farah said Ungogo is the hotbed of diphtheria in Kano State.

This study employs probability sampling technique which means that certain parameters serve as the benchmark in generating data from the population of study. Two wards namely Tudun Fulani and Rijyar Zaki are purposefully selected because the former has the high numbers of confirmed cases of diphtheria and the latter has low number of cases which makes it representative and adequate. The purposive sampling method was also used in identifying the respondents to be administered questionnaire. In order to achieve accuracy, The 400 questionnaires were equally administered in the two selected wards. This means 200 questionnaires were administered in Tudun Fulani and Rijyar Zaki each.

This is to scientifically reduce the number of the population of study to a sizeable constituent. The study employs Taro Yamani statistical formula in order to arrive at a representative and adequate sample size feasible for this research. According to the NBS, the population is 365,737.

$$n = \frac{N}{1 + N (e)^2}$$

Where
N = population size
n = sample size
e = margin of error
then
N = 365 737
e = 0.05

$$n = \frac{365737}{1 + 365\,737\ (0.0025)}$$

$$n = \frac{365737}{915.3}$$

n = 399.5
n = 400 (rounded)

The instrument used for data collection in the research is questionnaire. The study uses the Statistical Package for Social Sciences (SPSS) in analysing the primary data generated from the respondents.

IV. Result and Discussion

Table 1. level of Knowledge of diphtheria vaccine messages among residents of Ungogo Local Government Area, Kano State

Exposure to diphtheria vaccine messages on radio								
Score					Total	NoR	Mean	Std
Never	Rarely	Sometimes	Often	Always				
RIJ (0)	RIJ(30)	RIJ (50)	RIJ (10)	RIJ (110)	Total	390	4.33	2.08
TUD (0)	TUD (0)	TUD (20)	TUD (20)	TUD (150)	Score			
Total= 0	Total= 30	Total= 70	Total= 30	Total= 260	1690			
Discuss the diphtheria vaccine messages with friends, family or community member								
RIJ (80)	RIJ (30)	RIJ (60)	RIJ (30)	RIJ (10)	Total	390	3.28	1.81
TUD (0)	TUD (20)	TUD (40)	TUD (20)	TUD (110)	Score			
Total= 80	Total= 50	Total= 100	Total=50	Total= 120	1280			
Importance of radio in disseminating diphtheria vaccine messages								
NAI	LM	N	VI	EI	Total	390	4.61	2.14
RIJ (0)	RIJ (0)	RIJ (20)	RIJ (50)	RIJ (130)	Score			
TUD (0)	TUD (0)	TUD (20)	TUD (20)	TUD(150)	1800			
Total= 0	Total= 0	Total=40	Total= 70	Total= 280				
Understand diphtheria vaccine messages disseminated on radio								
VD	D	N	E	VE	Total	390	4.71	2.17
RIJ (0)	RIJ (0)	RIJ (10)	RIJ (20)	RIJ (170)	Score			
TUD (0)	TUD (0)	TUD (20)	TUD (30)	TUD (140)	1840			
Total= 0	Total= 0	Total= 30	Total=50	Total=310				
Diphtheria vaccine is only necessary for children								
SD	D	N	A	SA	Total		3.33	1.82
RIJ (20)	RIJ (0)	RIJ (30)	RIJ (110)	RIJ (40)	Score			
TUD (70)	TUD (30)	TUD (10)	TUD (10)	TUD (70)	1300			
Total= 90	Total= 30	Total=40	Total=120	Total=110				
Highly Contagious Disease								
RIJ (0)	RIJ (0)	RIJ (10)	RIJ (30)	RIJ (150)	Total		4.69	2.16
TUD (20)	TUD (0)	TUD (0)	TUD (10)	TUD (170)	Score			
Total=20	Total= 0	Total= 10	Total=40	Total= 320	1830			
Feel informed about diphtheria								
RIJ (0)	RIJ (O)	RIJ (20)	RIJ (40)	RIJ (140)	Total		3.35	1.83
TUD (0)	TUD (0)	TUD (20)	TUD (20)	TUD (150)	Score			
Total= 0	Total= 0	Total= 40	Total= 60	Total= 190	1310			
Diphtheria vaccine is usually administered as part of combination vaccine								
RIJ (0)	RIJ (0)	RIJ (0)	RIJ (60)	RIJ (140)	Total		4.69	2.16
TUD (0)	TUD (20)	TUD (0)	TUD (0)	TUD (170)	Score			
Total= 0	Total= 20	Total=0	Total=60	Total= 310	1830			

The data shows that Ungogo residents have knowledge on diphtheria messages. Based on the findings, radio is an extremely important medium for disseminating diphtheria in Ungogo local government with an acceptable mean. Out of 390 respondents, 310 respondents

which represent 79.4 percents found the diphtheria vaccine messages very easy to understand. This indicates that the residents of Ungogo are knowledgeable of diphtheria vaccine. Majority of the respondents feel informed about diphtheria with an acceptable mean of 3.35.

About 370 respondents agreed that diphtheria vaccine is usually administered as part of combination vaccine which indicates the high level of knowledge of diphtheria among residents of Ungogo Local Government Area, Kano State. The data revealed that those in Tudun Fulani are much more knowledgeable about diphtheria than those in Rijyar Zaki. Based on the assumption of Knowledge gap theory, states that information disseminated through mass media are not uniformly received in the society because people with low social economic status are not well informed. However, radio being a cost-effective medium tends to bridge the knowledge gap in the society as people with low social economic status rely heavily on radio for news.

Table 2. How residents of Ungogo Local Government Area, Kano state perceive diphtheria vaccine messages

Perceive diphtheria vaccine messages positive							
Sore							
SD	D	N	A	SA	Total	4.84	2.2
RIJ (0)	RIJ (0)	RIJ (10)	RIJ (80)	RIJ (110)	Score		
TUD (0)	TUD(0)	TUD(0)	TUD (110)	TUD (80)	1890		
Total= 0	Total= 0	Total=10	Total=190	Total= 190			
Diphtheria vaccine messages disseminated on radio are convincing							
RIJ (0)	RIJ (0)	RIJ (10)	RIJ (110)	RIJ (80)	Total	4.43	2.10
TUD (0)	TUD (0)	TUD (0)	TUD (90)	TUD (100)	Score		
Total= 0	Total= 0	Total= 10	Total= 200	Total=180	1730		
Diphtheria vaccine messages are effective							
RIJ (0)	RIJ (0)	RIJ (10)	RIJ (80)	RIJ (110)	Total	4.43	2.10
TUD (10)	TUD (0)	TUD (0)	TUD (80)	TUD (100)	Score		
Total= 10	Total=0	Total= 10	Total= 160	Total=210	1730		
Diphtheria messages addressed common misconception about the vaccine							
RIJ (10)	RIJ (0)	RIJ (20)	RIJ (130)	RIJ (40)	Total	3.97	1.99
TUD (0)	TUD (20)	TUD (0)	TUD (90)	TUD (80)	Score		
Total= 10	Total=20	Total= 20	Total= 220	Total=120	1550		

The data shows that Ungogo residents perceived the diphtheria vaccine positive. 97.4 % of the total respondents found diphtheria vaccine messages convincing with an acceptable mean of 4.43. Majority of the respondents agreed that the messages are effective while 10 respondents disagreed and the other 10 neither agree nor disagree. 80 respondents from Tudun Fulani ward strongly agree that the messages adequately addressed common misconception about the vaccine which represents 66.6 percent higher than that of Rijyar Zaki which stands at 33.3 percents. The data aligns with the basic assumption of perception theory that information perceived positive tend to affect individuals' attitude, feeling and behavior.

Table 3. The impact of diphtheria vaccine messages among residents of Ungogo Local Government Area, Kano State

Influence of diphtheria vaccine messages towards attitude							
Score						Mean	Std
NAI	SI	SOI	VI	EI	Total	3.41	1.84
RIJ (0)	RIJ (30)	RIJ (120)	RIJ (30)	RIJ (20)	Score		
TUD(0)	TUD(0)	TUD(80)	TUD(90)	(TUD(20)	1330		
Total=0	Total= 30	Total= 210	Total= 110	Total= 40			

Believe the effectiveness of diphtheria vaccine							
SD	D	N	A	SA	Total	4.23	2.05
RIJ (0)	RIJ (0)	RIJ (0)	RIJ (0)	RIJ (110)	Score		
TUD (0)	TUD (20)	TUD (60)	TUD (60)	TUD (50)	1650		
Total= 0	Total= 20	Total= 60	Total= 60	Total= 160			
Diphtheria vaccine side-effect							
RIJ (0)	RIJ (10)	RIJ (130)	RIJ (30)	RIJ (30)	Total	3.56	1.88
TUD (0)	TUD (0)	TUD (70)	TUD (100)	TUD (20)	Score		
Total=0	Total= 10	Total= 200	Total= 130	Total=50	1390		
Diphtheria messages increase confidence							
RIJ (0)	RIJ (0)	RIJ (70)	RIJ (100)	RIJ (30)	Total	3.76	1.93
TUD (0)	TUD (20)	TUD (40)	TUD (100)	TUD (30)	Score		
Total= 0	Total= 20	Total= 110	Total= 200	Total=60	1470		
Vaccination as a result of diphtheria vaccine messages							
RIJ (20)	RIJ (30)	RIJ (70)	RIJ (20)	RIJ (60)	Total	3.84	1.95
TUD (10)	TUD (30)	TUD (0)	TUD (40)	TUD (120)	Score		
Total=30	Total= 60	Total= 70	Total= 60	Total=180	1500		
Action as a result of diphtheria vaccine messages							
RIJ (20)	RIJ (20)	RIJ (50)	RIJ (80)	RIJ (30)	Total	3.71	1.92
TUD (0)	TUD (20)	TUD (30)	TUD(60)	TUD (80)	Score		
Total= 20	Total= 40	Total= 80	Total= 140	Total= 110	1450		

The data shows that the impact of diphtheria vaccine messages in improving and sustaining existing behavior on diphtheria in Ungogo Local Government Area, Kano State. Out of 390 respondents, 260 respondents agreed that the messages have increased their confident in the safety and efficacy of the vaccine which represent 66.6 percent. About 240 respondents had vaccinations as a result of exposure to diphtheria vaccine messages. Residents of Tudun Fulani strongly agreed that they have been vaccinated as a result of diphtheria vaccine messages received on radio.

V. Conclusion

This study found that the residents of Ungogo Local Government Area, Kano state have knowledge about diphtheria vaccine messages. The study also found that the residents perceive diphtheria vaccine positively. The study also concluded that radio is cost-effective in bridging knowledge gap between social classes in Ungogo Local Government Area, Kano state. The study also concluded that exposure to diphtheria vaccine messages on radio has increased the confidence on the safety and efficacy of the vaccine among residents of Ungogo Local Government Area, Kano state.

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