

**AWARENESS, ATTITUDE AND PRACTICE OF TRADERS IN EKEOHA MARKET,
ABA TOWARDS THE SPREAD OF DISEASES THROUGH THE NIGERIAN
CURRENCY**

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ABSTRACT

BACKGROUND: Money is absolutely essential in the day to day transactions and in the process of these transactions money is passed from hand to hand, rendering it vulnerable to contamination with various pathogenic diseases and also conferring on it the potential to transmit diseases. Many people are not aware that diseases can be transmitted by the way we handle money. However, if money is handled hygienically and appropriately, it will obviously reduce disease burdens. Hence, this research conducted on traders in Ekeoha market, Aba.

AIM: To assess the awareness, attitude and practice of traders in Ekeoha market towards the spread of diseases through the Nigerian currency.

MATERIALS AND METHODS: This was a cross-sectional descriptive study involving 393 traders of Ekeoha market, Aba. Data was obtained from traders in Ekeoha market using a interviewer-administered questionnaires and analyzed with IBM SPSS version 20.0.

RESULTS: The mean age of our respondents was 36.6±12.4 years, with majority falling within the age bracket 18-27 (27.7%) and 28-37(27.2%). There were 143(36.5%) females and 250 (63.6%) males. 344(87.5%) traders are aware that money passing from hand to hand gets contaminated. 318(80.9%) got this information through radio and television. 205(52.2%) moisten their fingers to count money, while 277(70.5%) wash their hands before eating after handling money. Age and marital status showed statistical significant association with awareness of the respondents (p=0.035 and p=0.002 respectively).

CONCLUSION: Majority of traders in Ekeoha market were aware that money transmits diseases and washes their hands before eating after handling money. More enlightenment and awareness programs are advocated to educate traders on the proper handling of paper money to prevent its contamination.

KEY WORDS: Awareness, attitude, practice, Ekeoha market, Nigerian currency.

INTRODUCTION

Most of us are aware that infectious diseases exact a large toll on humans around the world. Some diseases kill, others maim, and most cause a loss in productivity while the infected person is too ill to go about his/her daily life.¹ It is common knowledge that these infectious diseases are caused by pathogenic microorganisms such as bacteria, viruses and fungi.²

Generally speaking, microbial organisms are ubiquitous in nature, man in his day-to-day activities encounter quite a good number of them and also serve as vehicles of spread in addition to other sources of microbial transmission. Whereas some of these microbial organisms are harmless or even beneficial to man, others are pathogenic, causing various forms of infections and diseases.²

It is also worthy of note that microbes or germs can spread directly from person to person or indirectly from an infected person to the environment (for example toys, door handles, bench tops, bedding and toilets) and then to another individual who comes in contact with these contaminated environmental source.³

Since microbes can spread through inanimate objects, it then follows logically that the currency or money which is handled by all and sundry globally is of great importance when considering international health.

Money (Legal Tender)

Money is any item or verifiable record that is generally accepted as payment for goods and services and repayment of debts, such as taxes, in a particular country or socio-economic context⁴

The main functions of money are outlined as:

- A medium of exchange,
- A unit of account,
- A store of value and sometimes,
- A standard of deferred payment.

Any item or verifiable record that fulfils these functions can be considered as money.⁵

Starting over three thousand years ago, cowry shells or copies of the shells were used as currency in China. The classical Chinese character for money currency originated as a pictograph of a cowry shell. Also, Cowries were formerly used as means of exchange in India⁶.

In ancient Africa, cowries represented wealth and were traded for food, goods and other services. Besides being used as currency, cowries were also associated with sexual pleasure and good luck. Given the materials of some of these currencies, and the general absence of formalized denominations until the colonial period, some early European accounts defined certain transactions as barter.⁷

In the late 1800s and early 1900s, scientists began to theorize that the transmission of money (i.e. moving from hand to hand) was associated with the transmission of disease.⁸ As these are moved from hand to hand, they become contaminated in the process and hence may constitute a public health concern.

Money is essential in our day-to-day subsistence. It is an important commodity that allows us to exchange goods and services in the market system⁹. This makes it one of the most frequently passed from hand to hand and globally too. From the foregoing, money can be said to be a vehicle through which infectious diseases can spread. Money is known as a myriad of microorganisms, the infectious ones are of a major concern, because this may bring about public health concerns, especially that everybody in one way or the other uses money as a means of exchange.⁹

Currency (money) denominations are divided into coins and paper money (bank notes). The currency note is more commonly and routinely passed among individuals. During its passing, money can get contaminated and may thus play a role in the transmission of microorganisms to other people. For example, money may get contaminated with microorganisms from the respiratory and gastro-intestinal tract during counting¹⁰. This is basically because people often lick or moisten their fingers with saliva when counting money.

Although, the surfaces of money are not usually suitable for the survival of microorganisms, except for some organisms that are resistant to external condition and the non-resistant forms of spores. However, bacteria could spread on the surface of paper currency due mainly because paper currency offers a larger surface area to these pathogens to thrive.⁹

Microorganisms have the tendency to endure on surfaces for longer periods of time. Therefore, a large number of microbes can be found accumulated on the surface of older paper notes.⁹

In addition to these facts, the general hygiene levels of a community or society may contribute to the amount of microbes found on coins and notes, and thus the chance of transmission during the handling of money.¹⁰

The naira [₦] is the legal tender in Nigeria.³It possesses all the qualities and characteristics of money found anywhere else in the world. It is one of the unifying factors in our daily activities. Being a medium of exchange, the Naira is handled by all persons, irrespective of their social status, sex, age and health conditions.²

Unfortunately, the Naira has suffered so much abuse and mishandling that sometimes it becomes difficult to even recognize some of the currency notes and these attitudes have made the currency prone to contamination with micro-organisms. Some of the attitudes which amount to abuse and mishandling of the Naira include; multiple folding, squeezing, tip biting, spitting on the fingers or moistening the fingers with saliva while counting money etc. ²

Although every location contains endemic bacterium, the microorganisms most commonly isolated on money included members of the family Enterobacteriaceae, Mycobacteriumtuberculosis, Vibriocholerae, Bacillus sp., Staphylococcus sp., Micrococcus sp., and Corynebacterium sp. Common background contaminants of paper money are environmental organisms such as gram-positive flora (especially Bacillus sp.) and those arising from human normal skin flora such as Staphylococcus aureus. Developing nations have the highest rates of currency contamination. ⁷

An Indian study reported that 86.4% of the 120 currency notes tested at the department of microbiology, Tirunelveli Medical College, Tamil Nadu, were contaminated with disease causing pathogens such as Klebsiella pneumoniae, E.coli, Staphylococcus aureus. The currency notes were collected from a variety of sources including doctors, bankers, local traders, butchers, students and housewives. Surprisingly, the notes collected from doctors were also infected.⁷

Another study carried out in India has also expressed grave concern over both bacterial and fungal contamination of currency, on the basis of a study of 530 notes (1-3 years old) of all denominations and 300 coins collected from Srikakulum and Visakapatnam in Andhra Pradesh.¹¹

Yet another study carried out in India revealed that 58 per cent of bank notes carried disease causing pathogens. Hundred notes of Rs 100, 50, 20 and 10 denominations collected in Davanagere, Karnataka, were checked for the study.¹¹

In Nigeria, an NYSC Community Development project carried out by a first tier Corp member of 1995/96 who served in Adeoyo Maternity Hospital, Yemetu, Ibadan carried out a study on the contamination of the Naira through indiscriminate handling especially due to the poor environmental hygiene level. This study which was titled 'the role of the Nigerian currency in the transmission of infections and diseases' gave birth to a publication called 'Contaminated Naira As A Health Hazard' in Oct. 1996.² The study analysed seventy-five samples which included different denominations of the Naira and 65.3% of the total samples were contaminated with mostly enterobacteria which is suggestive of our low hygiene status.

The transmission of an infective (disease causing) agent is sometimes by direct contact but is more often by indirect process, involving various vehicles which include among others; air, dust, water, food, milk ²,ATM machines and even Currency by virtue of its movement from hand to hand. Simply put, in the transmission or spread of diseases, the causative organisms (pathogenic organisms) must be derived from a source e.g. humans, lower animals and inanimate sources are all possible sources of disease spread².

Inanimate surfaces have often been described as the source for outbreaks of nosocomial infections¹². The possibility that currency notes might act as environmental vehicles for the transmission of potential disease-carrying microorganisms was suggested in the 1970s ¹³.

Contamination of different objects by potential pathogenic microorganisms is of public health importance as contaminated materials can be possible sources of transmission of such pathogens. Bacteria have been shown to spread from person to person via contact with fomites. Currency is commonly and routinely passed among individuals. Thus, disease-carrying microbes could spread on the surface of paper currency ¹⁴.

Investigations suggest that dirty currency could host harmful micro-organisms which are also deposited on currency counting machines and the counting rooms' environment thereby posing risk to customers and bankers alike²⁷. Money, therefore presents a particular risk to public health, since communicable diseases can spread through contact with fomites ^{15, 16, 17, 18}.

As already mentioned, these pathogens may be bacterial, fungal or viral and they may also be opportunistic or primary pathogenic organisms. But being that viruses can hardly survive on inanimate objects or outside a living body, this study will focus more on bacteria and fungi due mainly to their roles in man's everyday interactions with his environment.

It is important to note that pathogenic microbial organisms have developed mechanisms (virulence) that enable them to invade living organisms (man inclusive), and to produce infectious disease ². The most common nosocomial pathogens may well survive or persist on surfaces for months and can thereby be a continuous source of transmission if no regular preventive surface disinfection is performed ¹⁹. The diseases caused by these agents may vary from mild to severe, with the most severe often leading to death.²

Unfortunately, these pathogens and their devastating effects are widely distributed in nature, but for the purpose of this study, we shall focus more on the awareness, attitude and practices of the traders in Ekeoha market of Aba, Abia state towards the spread of diseases through the Naira (The Nigerian currency).

METHODOLOGY

This study was a descriptive cross-sectional study carried out in Ekeoha Market, Aba, Abia State using interviewer-administered questionnaire to obtain information from consenting participants.

The study was conducted among male and female traders in Ekeoha market, Aba, Abia state who have traded in the market for over two years. A multistage random sampling method was used to select the study participants. First; the simple random sampling by balloting was used to select Aba South LGA from the 17 LGAs in Abia State. Then; Ekeoha market was selected by simple random sampling (balloting) from the other major markets within Aba South LGA. Subsequently; each respondent who met the inclusion criteria was recruited till the sample size was achieved.

The sample size will be statistically determined using this formula: $N = (Z^2pq)/d^2$ which gave us 427. Therefore additional questionnaire needed would be = $427 - 384 = 43$

RESULTS

393 traders participated in this cross-sectional descriptive study. The findings are presented below.

Table 1: Socio-demographic characteristics of respondents

VARIABLES	FREQUENCY (N=393)	PERCENTAGE (%)
Age group (in years)		
18-27	109	27.7
28-37	107	27.2
38-47	88	22.4
48-57	65	16.5
58+	24	6.2
Sex		
Male	250	63.6
Female	143	36.4
Marital status		
Single	182	46.3
Married	188	47.8
Divorced/separated	4	1.0
Widowed	19	4.8
Tribe		
Igbo	385	98.0
Hausa	0	0.0
Yoruba	4	1.0
Others	4	1.0
Religion		
Christianity	379	96.4
Islam	10	2.5
African traditional religion	2	0.5
Others	2	0.5
Denomination		
Catholic	188	47.8
Pentecostal	126	32.1
Jehovah witness	5	1.3
Others	61	15.5
Educational status		
None	15	3.8
Primary	37	9.4
Secondary	219	55.7

Tertiary	122	31.0
Stock of trade		
Textiles	290	73.8
Electronics	59	15.0
Provisions	9	2.3
Bureau du change	9	2.3
Household wares	3	0.8
Stationeries	8	2.0
Film production	7	1.8
Food sales	8	2.0

Mean age= 36.6±12.4 years

Table 1 above is on the socio-demographic characteristics of the respondents. Mean age is 36.6±12.4 years with majority (54.9%) being between 18 and 37 years. Over two-thirds are males (63.6%) and nearly all (98%) are from the Igbo tribe. A comparable proportion of the respondents were single (46.3%) and married (47.8%) with over 95% being Christians, mostly of the Catholic denomination (47.8%). Approximately 56% of the respondents have attained a secondary level of education while 73.8% of them deal on textiles.

Table 2: Awareness of spread of diseases through currency notes

Variables	Frequency	Percentages (%)
Are you aware that money passing from hand to hand gets contaminated?		
Yes	344	87.5
No	49	12.5
Have you heard that naira notes can spread diseases?		
Yes	318	80.9
No	75	19.1
*If Yes, what was your source of information?	n=599	
Radio	148	24.7

Television	128	21.4
Newspaper/magazine	70	11.7
Friends	96	16.0
Internet	67	11.2
Others	90	15.0
Have you had any enlightenment on handling money?		
Yes	151	38.4
No	242	61.6
Are you aware that food vendors can spread disease by contaminating food with money?		
Yes	346	88.0
No	47	12.0

***Multiple responses**

Table 2 shows the Awareness of spread of diseases through currency notes. A good number 344/393 (87.5%) are aware that money gets contaminated as it is passed from hand to hand, 80.9% of which have heard that currency notes can spread diseases. Their major sources of information were radio and television (24.7% and 21.4% respectively). Over 60% have not had any enlightenment on handling money while 88% of the traders were aware that food vendors can spread disease by contaminating food with money.

Table 3: Attitude towards spread of diseases through currency notes

Variables	Frequency	Percentages(%)
Money is necessary for day to day transactions		
Agree	221	56.2
Strongly Agree	171	43.5
Disagree	1	0.3

What is your reaction that money can spread disease?		
Surprised	73	18.6
Not surprised	268	68.2
Indifferent	52	13.2
Diseases can be avoided by handling money well		
Agree	255	64.9
Strongly agree	107	27.2
Disagree	31	7.9
Diseases contacted through currency can lead to economic loss		
Agree	246	62.6
Strongly agree	84	21.4
Disagree	63	16.0
Creating adequate awareness can reduce diseases		
Agree	204	51.9
Strongly agree	164	41.7
Disagree	25	6.4

Table 3 above is on Attitude towards spread of diseases through currency notes. While 56.2% of the respondents agree that money is necessary for day to day transactions, 68.2% of them were not surprised that money can spread diseases. A comparable proportion (64.9% and 62.6% respectively) agree that diseases can be avoided by handling money well and that diseases contacted through currency notes can lead to economic loss. 41.7% of them strongly agree that creating awareness can reduce diseases spread through currency notes.

Table 4: Practices that can facilitate spread of diseases through currency notes

Variables	Frequency	Percentages(%)
Do you moisten fingers to count money?		
Yes	205	52.2
No	188	47.8
Do you store money close to your skin?		
Yes	87	22.1
No	306	77.9
Do you wash hands before eating after handling money?		
Yes	277	70.5
No	109	27.7
Sometimes	7	1.8
How do you safe-keep your money?	n=531*	
In wallets	214	40.3
In pocket	167	31.5
Squeezed	28	5.2
In bags	59	11.1
In aprons	16	3.0
In iron box	47	8.9
Is there the practice of holding money in the mouth or using it in cleaning the ear?		
Yes	113	28.8
No	172	43.8
Not sure	108	27.5
Do you have enough toilet facilities in Ekeoha market?		
Yes	332	84.5

No	61	15.5
Do you have adequate hand washing facilities?		
Yes	256	65.1
No	137	34.9
Are there measures by govt. to discourage mutilation of naira notes?		
Yes	94	23.9
No	291	74.0
Not sure	8	2.0

***Multiple responses**

Table 4 shows the practices that facilitate the spread of diseases through the currency notes. More than half of the respondents (52.2%) moisten their fingers with saliva when counting currency notes, while a smaller proportion (22.1%) store their money close to their skin. A good number (70.5%) claim to wash their hands before eating after handling money, 5.2% agreed that they squeeze their money though about 40% safe-keep theirs in wallets. While 28.8% of the traders affirmed that there was the practice of holding money in the mouth or using it to clean the ears, 27.5% were not sure of such a practice. About 75% of them do not know if there were measures put in place by government to discourage the mutilation of the naira notes.



Figure 1: Chart showing how the traders safe-keep their money

Table 5: Practice score of the respondents

Variables	Frequency	Percentages(%)
Good Practice (≥ 4 points)	184	46.8
Poor Practice (< 4 points)	209	53.2
Total	393	100.0

Table 5 shows the Practice score of respondents. There were 4 practice indicators which were each scored 2 points giving a total of 8 points. Respondents who scored 4 points and above had good practice while those with < 4 points had poor practice. Hence, 184 (46.8%) had a good practice score while the majority, 209 (53.2%) had poor practice score.

Table 6: Effect of socio-demographic variables on awareness that currency notes spread diseases

Variable	Yes N (%)	No N (%)	χ^2	p-value
Age(in years)				
18-27	89 (81.7)	20 (18.3)	10.009	0.035*
28-37	93 (86.9)	14 (13.1)		
38-47	82 (93.2)	6 (6.8)		
48-57	61 (93.8)	4 (6.2)		
58+	19 (79.2)	5 (20.8)		
Sex				
Male	218 (87.2)	32 (12.8)	0.069	0.792
Female	126 (88.1)	17 (11.9)		
Marital status				
Single	147 (80.8)	35 (19.2)	14.131	0.002*
Married	174 (92.6)	14 (7.4)		
Divorced/separated	4 (100.0)	0 (0.0)		
Widowed	19 (100.0)	0 (0.0)		
Educational level				
None	14 (93.3)	1 (6.7)	0.550	0.908
Primary	32 (86.5)	5 (13.5)		
Secondary	192 (87.7)	27 (12.3)		
Tertiary	106 (86.9)	16 (13.1)		
Stock of trade				
Textiles	249 (85.9)	41 (14.1)	2.493	0.292
Electronics	54 (91.5)	5 (8.5)		
Others	41 (93.2)	3 (6.8)		

***Statistical significance**

Table 6 is on the effect of socio-demographic variables on the awareness that currency notes can spread diseases. Age and marital status showed statistical significant association with awareness of the respondents (p=0.035 and p=0.002 respectively).

Table 7: Effect of socio-demographic variables on practice score of respondents

Variable	Practice score		χ^2	p-value
	Poor practice N (%)	Good practice N (%)		
Age(in years)				
18-27	55 (50.5)	54 (49.5)	4.113	0.391
28-37	65 (60.7)	42 (39.3)		
38-47	46 (52.3)	42 (47.7)		
48-57	30 (46.2)	35 (53.8)		
58+	13 (54.2)	11 (45.8)		
Sex				
Male	130 (52.0)	120 (48.0)	0.385	0.535
Female	79 (55.2)	64 (44.8)		
Marital status				
Single	97 (53.3)	85 (46.7)	0.967	0.852
Married	98 (52.1)	90 (47.9)		
Divorced/separated	2 (50.0)	2 (50.0)		
Widowed	12 (63.2)	7 (36.8)		
Educational level				
None	8 (53.3)	7 (46.7)	0.736	0.865
Primary	20 (54.1)	17 (45.9)		
Secondary	120 (54.8)	99 (45.2)		

Tertiary	61 (50.0)	61 (50.0)		
Stock of trade				
Textiles	155 (53.4)	135 (46.6)	0.033	0.984
Electronics	31 (52.5)	28 (47.5)		
Others	23 (52.3)	21 (47.7)		

In table 7 above, none of the socio-demographic variables of the respondents showed any statistical significant association with the practice facilitating the spread of diseases through currency notes (naira).

DISCUSSION

Fomites are inanimate objects that can become colonized and serve as vectors in the transmission of pathogenic microorganisms. In this regard, money is considered as fomite. Literatures examining the awareness, attitude and practice of traders or people in general towards the spread of diseases through the currency are lacking, however, there were few researches that were similar to our work in approach, such works though scanty, were cited here.

Hence, we conducted this study to assess the awareness, attitude, and practices of traders in Ekeoha market of Aba, Abia state towards the spread of diseases through the Nigerian currency.

In our work, 393 traders participated in this cross-sectional descriptive study. They were 250 (63.6%) males and 143 (36.4%) females. This agrees with the work done in Pakistan where the 168 males and 185 females participated in their work.²⁰

Also, our work had more male participants than female participants and this agrees with research done by Adeoye et al, in Western Nigeria where out of the 500 subjects interviewed, 267 (53.4%) were males and 233 (46.6%) were females²¹. The age of the cohort ranged between 16 and 85 years. In contrast, our study was carried out among people between the age ranges of 18-58 years which varied slightly with their age range as stated above. Out of the 393 respondents in the studies

we carried out, 385 were Igbos. This is essentially because Ekeoha market is situated in Abia state which is an Igbo speaking state.

Again, over 95% of the respondents were Christians by religion with 47.8% of the total respondents being married, this also agrees with above as stated by their work that majority of subjects 76.8% were married and 64% were Christians ²¹. This is not also surprising since Christianity dominates other religions in Igbo land; Aba inclusive.

Approximately 56% of the respondents have attained a secondary level of education, 31% tertiary, 9.4% primary and 3.8% with no form of education at all. This result is also in agreement with the work done by Adeoye et al, which stated that only 63 persons (12.6%) were illiterate, 239 (47.8%) had received secondary education, and 52 (10%) had post-secondary education ²²

On awareness, 344 (87.5%) traders in Ekeoha market were aware that money gets contaminated as it is passed from hand to hand. This is because money is one of the objects most handled and exchanged by people in daily business transactions and as such could pose as one of the most potential vehicles to transmit pathogenic diseases, even between countries. ²¹ Interestingly, our interactions with these traders in the course of this study, shows that majority of traders in Ekeoha Market were aware that money gets contaminated as it passes from hand to hand.

About 80.9% of the traders in the market were not surprised that money can transmit diseases because they had heard from different sources such as mentioned above (Table2; on awareness). Also, they believe that transmission of diseases by money can be minimized by handling money appropriately. At the same time, they are not ignorant of the fact that diseases when contracted can lead to economic loss since the affected persons will be incapable of participating in economic activities (Business).

On attitude, 255 (64.9%) traders in Ekeoha market believed that diseases can be spread through money if not handled well, which agrees with a study done by Agho KE. et al ²² in Nigeria, where 63.1% of people believed that TB can be spread from person to person by indiscriminate sneezing or coughing without duly covering the mouth. However, their attitude towards the safe keeping and the handling of the currency is not reflective of their awareness as more than half of them (52.2%) still moisten their fingers while counting money.

On the practice of traders, more than half of the traders as already mentioned moisten their fingers while counting money, although a great majority of them admittedly wash their hands before eating especially after handling money. Many of them too have the encouraging practice of safe keeping of money in their wallets, bags, aprons and boxes.

CONCLUSION

In conclusion, transmission of disease-causing microbes may occur indirectly via inanimate objects in the surrounding environment and being a fomite, the currency can, not only conveniently accommodate pathogens when handled inappropriately but also has the potentials to aid in the spread of diseases in the course of its passing. Therefore it is important that positive attitudes and practices be encouraged and imbibed, hence, this study on the awareness, attitude and practice of Ekeoha Market Traders Aba, towards the spread of diseases through the currency

RECOMMENDATION:

Having interacted with these traders; we humbly recommend as follows;

- That health education programs be organized for the traders in the market on proper ways of handling money so as to minimize transmission of diseases.
- That stringent measure be instituted in the market and indeed in any other circle where money is being used as a means of transaction so as to deter mutilation of currency.
- That enlightenment programs be carried out periodically to further create awareness on the dangers of improper handling of the currency (The Naira).

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