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In **Table 3** above, the calculated chi-square value is 410.510 while the table value is 21.03. Since the critical value is greater than the table chi-square value, hence, the hypothesis that stated that dirty cooking environment will not significantly cause to food-borne diseases among residents of Ilorin West Local Government Area of Kwara State was rejected. Therefore, dirty cooking environment will significantly contribute to food-borne disease among residents of Ilorin West Local Government Area of Kwara State.

**Discussion of Findings**

The findings from tested hypothesis one (1) in table 1 above shows that poor hygiene practice contributes to the transmission of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State. The findings is in line with United Nations International Children Emergency Fund (2015), which demonstrated that food-borne diseases and food contamination did not just happen, they always have causes, and their causes are always stemming from unhygienic conditions and practices.

This finding from tested **hypothesis 2** revealed that food safety knowledge contributes to the transmission of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State. This is in-line with Bryan (1988) who opined that food safety requires proper handling from production through consumption. Food safety experts have identified the most common food handling problems by consumers as obtaining food from unsafe sources, inadequate cooking or heat processing, improper cooling, intervals of 12 hours or more between preparation and eating, poor hygiene or diseased persons handling implicated food.

The result of the analysis in tested **hypothesis 3** above shows that one of the causes of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State was poor cooking environment. This finding is in line with Jones and Angulo (2006) which stated that environment risk factors, food industry, food manufacturing, retail and catering sectors play important role in food-borne disease. Various studies of both sporadic and outbreak-associated diseases involving different geographic areas, varied study designs and a variety of pathogens have revealed that restaurants play an important role as source of food-borne diseases in the US. Many factors may contribute to an increased risk of food borne disease due to foods consumed in restaurants such as cross-contamination events within restaurants.

**Conclusion and Recommendations**

*It has been authoritatively revealed from the findings of this study that:*

a) Poor hygiene practice cause food-borne diseased among residents of Ilorin West Local Government Area of Kwara State.
b) Inadequate food safety knowledge caused food-borne diseases among residents of Ilorin West Local Government area of Kwara State.
c) Dirty cooking environments caused food borne diseases among residents.

Based on these findings, it is recommended that the local government through its health workers should mount heavy campaigns on the need to ensure good personal hygiene practice by the residents. Government should organize workshop/symposia to educate the residents

on how to ensure food safety. It is also recommended that environmental health officers and sanitarians should endeavour to carry out regular house-to-house inspections to ensure good cooking environment.

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# PERCEIVED CAUSES OF FOOD-BORNE DISEASES AMONG RESIDENTS OF ILORIN WEST LOCAL GOVERNMENT AREA OF KWARA STATE

*Dare A. BABA[1], S. N. AKOREDE[1], I. KPEROGI[1], A. O. AMBALI[2] & G. O ATANDA[3]

*Corresponding Author
[1]abadare2010@yahoo.com, abudakaroni@gmail.com
+2348062346210, +2348056678085
[1]Department of Health Promotion & Environmental Health Education,
Faculty of Education, University of Ilorin, Nigeria
[2]Department of Physical & Health Education,
Kwara State College of Education, Ilorin
[3]Department of Environmental Health,
Kwara State University Malete, Nigeria

**Abstract**

*The poor state of food hygiene and safety, coupled with poor sanitation practice, have led to outbreak of food-borne diseases such as cholera, typhoid fever, diarrhoea, dysentery and so on. This study examined perceived causes of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State. The study also aimed at determining the influence of poor food hygiene, inadequate food knowledge and dirty cooking environment on incidence of food-borne diseases among residents in Ilorin West Local Government Area of Kwara State. The study adopted descriptive research design of the survey type. The study population comprised all the residents of Ilorin West Local Government, estimated to be about 365,221. The main instrument used for the study was the researchers' structured questionnaire adequately validated by experts from Department of Health Promotion and Environmental Health Education; and Epidemiology and Community Health in University of Ilorin, Nigeria. The reliability of the research instrument was ascertained with the use of test re-test method in which a reliability correlation coefficient of 0,75 was obtained. Three (3) hypotheses were formulated and tested for the study. The data generated for the study were analyzed with the use of chi-square statistical method. The findings from the test of hypotheses revealed that poor hygiene practice caused food-borne diseases among residents of Ilorin West Local Government Area of Kwara State; inadequate food safety knowledge cause food-borne diseases among residents of Ilorin West Local Government area of Kwara State; dirty cooking environment caused food borne diseases among the residents. Based on these findings, it is recommended that the local government through its health workers, should mount heavy campaigns on the need to ensure good personal hygiene practice by the residents; government should organize workshop/symposia to educate the residents on how to ensure food safety; it is also recommended that environmental health officers and sanitarians should endeavour to carry out regular house-to-house inspections to ensure good cooking environments.*

**Keywords:** *Perceived, Causes, Food-borne diseases, Residents*

**Introduction**

The global incidence of food-borne diseases is difficult to estimate. It has been reported that in 2005 alone, 1.8 million people died from diarrhea. It has been observed that a great proportion of these cases could be attributed to contamination of food and drinking water. In industrialized countries, the percentage of the population suffering from food-borne diseases each year has been reported to be up to 30%. In the United States of America (USA), for example, around 76 million cases of food-borne diseases, resulting in 325,000 hospitalizations and 5,000 deaths, are estimated to occur each year. It has been observed that developing countries bear the brunt of the problem due to the presence of a wide range of food-borne diseases, including those caused by parasites. Most of food-borne diseases are sporadic and often not reported. Food-borne disease outbreaks may take on massive proportions. For example, in 1988, an outbreak of hepatitis A, resulting from the consumption of contaminated clams, affected some 300,000 individuals in China (World Health Organization, 2008).

Tauxe, Ward & Warren (2010) opined that changes in the globalization of good trade have implications for food safety. Centralized production of foods means we depend on food safety system in other countries and when a problem occurs, it can lead to a widespread outbreak. A contaminated food can rapidly cause a geographically widespread or "dispersed scenario" type of food-borne disease outbreak. These outbreaks lead to a typically detected lab-based subtype surveillance which to a multistage or country investigation.

Human nutrition basics require that food be consumed in an unbound, reduced and wholesome form so as to facilitate digestion, absorption and excretion. It also requires that food consumed to promote good health does not constitute any form of health hazard or such nutrition disorder as obesity, underweight, iron deficiency, dental caries, allergies and irritation of the gastrointestinal (GI) tract. Others are attention deficit, hyperactivity, disorder autism, spectrum disorder, dietary fat and cardiovascular disease (Mahan & Escott-Stump, 2010).

Food-borne illness is sometimes called 'food-borne disease', 'food-borne infection', or 'food poisoning'. It is a common, costly, yet preventable public health problem. It consists of a large part of the global mortality burden. The true extent of their impact remains unknown. Food-borne diseases encompass a wide spectrum of illnesses that manifest after the ingestion of contaminated food and food products (WHO, 2008). United Nations International Children Emergency Fund (2015) stated that food-borne diseases and food contamination did not just happen; they are always causes and their caused are always stemming from unhygienic conditions and practices.

The current trend revealed that there are about 250 different food-borne diseases. Most of these diseases are infections, caused by a variety of bacteria, viruses, and parasites that can be food-borne. Other diseases are poisonings, caused by harmful toxins or chemicals that have contaminated that food, for example, poisonous mushrooms (Centers for Disease Control and Prevention (CDC), 2014). Bryan (1988) opined that food safety requires proper handling from production through consumption. Food safety experts have identified the most common food

handling problems by consumers as obtaining food from unsafe sources, inadequate cooking or heat processing, improper cooling, intervals of 12 hours or more between preparation and eating, poor hygiene or colonized person handling implicated food.

The most common clinical presentation of food-borne illness takes the form of gastrointestinal symptoms. However, such diseases can also have neurological, gynecological, immunological and other symptoms. Multi-organs failure and even cancer may result from the ingestion of contaminated foodstuffs, thus representing a considerable burden of disability as well as mortality (WHO, 2015).

It is quite disturbing that over 200,000 Nigerians die of food poisoning every year. This is as a result of consumption of imported adulterated foods produced and consumed by many Nigerians. Sometimes, these processed foods would have expired, but because the importers would not want to lose their money, they tamper with the expiry dates and push the items to the market. A number of times, regulatory bodies have had to destroy rotten and expired cartons of fish and poultry products meant for Nigerian market. This is part of the protective measures that can be taken (Alfred, 2012).

Jones & Angulo (2006) stated that environment-risk factors, food industry, food manufacturing, retail and catering sectors play important role in food-borne diseases. Various studies of both sporadic and outbreak-associated diseases involving different geographic areas, varied study designs and a variety of pathogens have revealed that restaurants play an important role as sources of food-borne diseases in the United States (US). Many factors may contribute to an increased risk of food-borne diseases due to foods consumed in restaurants such as cross-contamination events within restaurants.

The purpose of the study is to; determine if poor hygiene, inadequate food safety knowledge and dirty cooking environments will significantly contribute to the outbreak of food-borne illness among residents of Ilorin West Local Government Area of Kwara State.

***Statement of the Problem***

Food-borne illnesses comprise broad areas of diseases and are responsible for lots of morbidity and mortality worldwide. It is a growing public health problem in developing as and developed countries. It is difficult to determine the exact mortality associated with food-borne illnesses (Helms, Vastrup, Gerner-Smidt & Molbak, 2003). However, worldwide it is estimated that about 2 million deaths occurred due to gastrointestinal illness, during the year 2005. Although majority of the food-borne illness cases are mild and self-limiting, severe cases are possible, which could result in high risk groups resulting in high mortality and morbidity. The high risk groups for food-borne diseases include infants, young children, the elderly and the immune compromised persons (Fleury, Stratton, Tinga, Charron & Aramini, 2008).

The poor state of food sanitation in the country has been observed as one major causes every year of about six hundred thousand (600,000) cases of diarrhoea in children under the age of five. Secondly, there have been increasing numbers of cases of food-borne diseases over the years. In addition, in 1994 alone, there were 3,173; 12,716; and 22,525 cases of cholera; food

poisoning and typhoid/paratyphoid fevers respectively. Lastly, in 1998, the cases were 9,254; 32,411 and 68,846 respectively and by 2001, cholera and typhoid cases have further increased to 10,294 and 73,949 cases respectively (Federal Ministry of Health, 2004).

Alfred (2012) reported that six family members died in Gombe Local Government Area of Adamawa State after eating *moin-moin* prepared from suspected poisoned beans, two of which were children. The health of people in many countries can be affected by consuming contaminated food products, and may negatively impact on the country's tourist industry. The food-borne illnesses outbreaks reported frequently at national as well as international level underscoring the importance of food safety (WHO, 2011c).

**Purpose of the Study**

The general purpose of the study is examined the factors causing food-borne illness among residents of Ilorin West Local Government Area, Kwara State. The following are the specific objectives of the study. To find out if

a) poor hygiene practice causes food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.
b) inadequate food safety knowledge causes food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.
c) dirty cooking environment causes food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.

**Research Hypotheses**

a) Poor hygiene practice will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.
b) Inadequate food safety knowledge will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.
c) Dirty cooking environment will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State.

**Method**

The research design adopted for this study was descriptive research design of the survey type The population for this study includes all the residents of Ilorin West Local Government, Kwara State estimated to be 365,221in figure according to the 20066 Census. A multi-stage sampling technique was used to select three hundred and eighty four (384) respondents used for the study. A stratified sampling technique was used to classify the local government into twelve (12) wards. This stage was followed with the use of simple random sampling technique to select four wards based on 33.3% of the twelve wards within the local government area. Clauster sampling technique was employed to classify the four wards into three hundred and eighty four (384) households. A purposive sampling technique was used to select heads of the households in the four wards selected within the metropolis totaling three hundred and eighty four (384) heads.

The main research instrument used for the study was researchers-structured questionnaire adequately validated by experts from health promotion and environmental health education and epidemiology and community health University of Ilorin. The reliability of research instrument was ascertained through test re-test method. The researchers administered twenty copies of structured questionnaire twice to group of respondents that will not participate in the final study. The two results of administrations were compared, using Parson Product Moment Correlation Coefficient statistical method in which coefficient of correlation of 0.75 was obtained.

The data generated from administration of three hundred and eighty four (384) questionnaires to respondents selected for the study were grouped, coded and sorted out with the use of SPSS statistical package, and chi-square ($x^2$) statistical method was used to analyze the coded data at 0.05 alpha level. The result of analysis are tabulated below:

**Results and Discussion of Findings**

**Ho1:** *Poor hygiene will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State*

**Table 1: Showing the Chi-Square Analysis of Poor Hygiene and Food-Borne Diseases Among Residents**

| S/N | Item | SA | A | D | SD | Row Total | Df | Cal. $x^2$ value | Crit. $x^2$ value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | There are many food-borne diseases that could be caused by poor domestic and personal hygiene | 104 (27.2%) | 274 (72%) | 4 (0.7%) | 2 (0.1%) | 384 | | | | |
| 2. | People are the key to preventing the risk of food-borne diseases by practicing good hygiene | 308 (80.5%) | 63 (17.5%) | 10 (1.8%) | 10 (0.7%) | 384 | | | | |
| 3. | Limiting direct hand contact with all food items is one of the first line of defence in reducing food-borne diseases | 247 (65.2%) | 97 (25.0%) | 24 (6.0%) | 16 (3.8%) | 384 | 12 | 527.01 | 21.03 | Hypothesis Rejected |
| 4. | People can be carriers of disease causing microorganisms and not how symptoms | 135 (80.2%) | 243 (18.0%) | 4 (0.1%) | 2 (0.8%) | 384 | | | | |
| 5. | Poor hygiene practices can help transmission of disease-causing germs | 311 (31.1%) | 67 (68.0^) | 2 (0.8%) | 4 (0.1%) | 384 | | | | |
| | Column Total | 1105 | 744 | 44 | 27 | 1920 | | | | |

**@0.05 alpha level of significance**

The result of analysis in **Table 1** shows calculated chi-square value of 527.01 against the table chi-square value of 21.03. Since the critical value is greater than the table value, the hypothesis, which stated that "poor hygiene will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State", was rejected. Therefore, poor hygiene has much contribution to food-born diseases among residents of Ilorin West Local Government Area of Kwara State.

**Ho2:** *Inadequate food safety knowledge will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State*

**Table 2: Showing the Chi-Square Analysis of Food Safety Knowledge and Food-Borne Diseases Among Residents**

| S/N | Item | SA | A | D | SD | Row Total | Df | Cal. $x^2$ value | Crit. $x^2$ value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Food safety practices include a number of routine that should be followed to avoid potentially severe health hazards | 210 (56.9%) | 167 (42.0%) | 2 (0.1%) | 5 (1.0%) | 384 | 12 | 341.14 | 21.03 | Hypothesis Rejected |
| 2. | Food safety requires proper handling from production through consumption | 287 (75.3%) | 94 (24.0%) | 3 (0.7%) | 0 (0%) | 384 | | | | |
| 3. | Food that can make one sick will always smell and taste bad | 284 (77.1%) | 86 (20.0%) | 11 (2.2%) | 3 (0.7%) | 384 | | | | |
| 4. | Cooking food for the appropriate length of time and temperature takes unnecessary time | 252 (67.9%) | 126 (31.0%) | 5 (1.0%) | 1 (0.1%) | 384 | | | | |
| 5. | Barriers to safe food handling are cultural or simply due to lack of resources | 304 (74.5%) | 78 (25.0%) | 2 (0.5%) | 0 (0%) | 384 | | | | |
| | Column Total | 1337 | 571 | 23 | 9 | 1920 | | | | |

**@0.05 alpha level of significance**

The result of analysis in Table 2 shows the calculated chi-square value of 341.14 and critical table chi-square value of 21.03. Since the calculated value is greater than the critical table value, hence, the hypotheses which stated that inadequate food safety knowledge will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State was rejected. Therefore, poor hygiene has much contribution to food-borr diseases among residents of Ilorin West Local Government Area of Kwara State.

**Ho3:** *Dirty cooking environment will not significantly cause food-borne diseases among residents of Ilorin West Local Government Area of Kwara State*

**Table 3: Showing the Chi-Square Analysis of Dirty Cooking Environment and Food-Borne Diseases Among Residents**

| S/N | Item | SA | A | D | SD | Row Total | Df | Cal. $x^2$ value | Crit. $x^2$ value | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Environment risk factors, food industry, retail and catering sectors play important role in food borne disease | 327 (85.5%) | 49 (12.5%) | 2 (0.5%) | 6 (1.5%) | 384 | 12 | 410.51 | 21.03 | Hypothesis Rejected |
| 2. | An adequate number of washbasins and flush lavatories must be available in a kitchen | 248 (62.3%) | 133 (37.0%) | 3 (0.7%) | 0 (0%) | 384 | | | | |
| 3. | There are general requirements that food premises must be kept clean and maintained in good repair and condition | 174 (44.8%) | 197 (52.0%) | 6 (1.5%) | 7 (1.7%) | 384 | | | | |
| 4. | Most kitchens are often crowded with irrelevant items to cooking | 276 (72.8%) | 87 (22.0%) | 9 (2.2%) | 12 (3.0%) | 384 | | | | |
| 5. | Populations with low socio-economic status have less access to high-quality food products due to dirty environment | 282 (75.0%) | 76 (19.0%) | 14 (3.5%) | 12 3.0%) | 384 | | | | |
| | Column Total | 1307 | 542 | 34 | 37 | 1920 | | | | |

**@0.05 alpha level of significance**

In **Table 3** above, the calculated chi-square value is 410.510 while the table value is 21.03. Since the critical value is greater than the table chi-square value, hence, the hypothesis that stated that dirty cooking environment will not significantly cause to food-borne diseases among residents of Ilorin West Local Government Area of Kwara State was rejected. Therefore, dirty cooking environment will significantly contribute to food-borne disease among residents of Ilorin West Local Government Area of Kwara State.

**Discussion of Findings**

The findings from tested hypothesis one (1) in table 1 above shows that poor hygiene practice contributes to the transmission of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State. The findings is in line with United Nations International Children Emergency Fund (2015), which demonstrated that food-borne diseases and food contamination did not just happen, they always have causes, and their causes are always stemming from unhygienic conditions and practices.

This finding from tested **hypothesis 2** revealed that food safety knowledge contributes to the transmission of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State. This is in-line with Bryan (1988) who opined that food safety requires proper handling from production through consumption. Food safety experts have identified the most common food handling problems by consumers as obtaining food from unsafe sources, inadequate cooking or heat processing, improper cooling, intervals of 12 hours or more between preparation and eating, poor hygiene or diseased persons handling implicated food.

The result of the analysis in tested **hypothesis 3** above shows that one of the causes of food-borne diseases among residents of Ilorin West Local Government Area of Kwara State was poor cooking environment. This finding is in line with Jones and Angulo (2006) which stated that environment risk factors, food industry, food manufacturing, retail and catering sectors play important role in food-borne disease. Various studies of both sporadic and outbreak-associated diseases involving different geographic areas, varied study designs and a variety of pathogens have revealed that restaurants play an important role as source of food-borne diseases in the US. Many factors may contribute to an increased risk of food borne disease due to foods consumed in restaurants such as cross-contamination events within restaurants.

**Conclusion and Recommendations**

*It has been authoritatively revealed from the findings of this study that:*

a) Poor hygiene practice cause food-borne diseased among residents of Ilorin West Local Government Area of Kwara State.
b) Inadequate food safety knowledge caused food-borne diseases among residents of Ilorin West Local Government area of Kwara State.
c) Dirty cooking environments caused food borne diseases among residents.

Based on these findings, it is recommended that the local government through its health workers should mount heavy campaigns on the need to ensure good personal hygiene practice by the residents. Government should organize workshop/symposia to educate the residents

on how to ensure food safety. It is also recommended that environmental health officers and sanitarians should endeavour to carry out regular house-to-house inspections to ensure good cooking environment.

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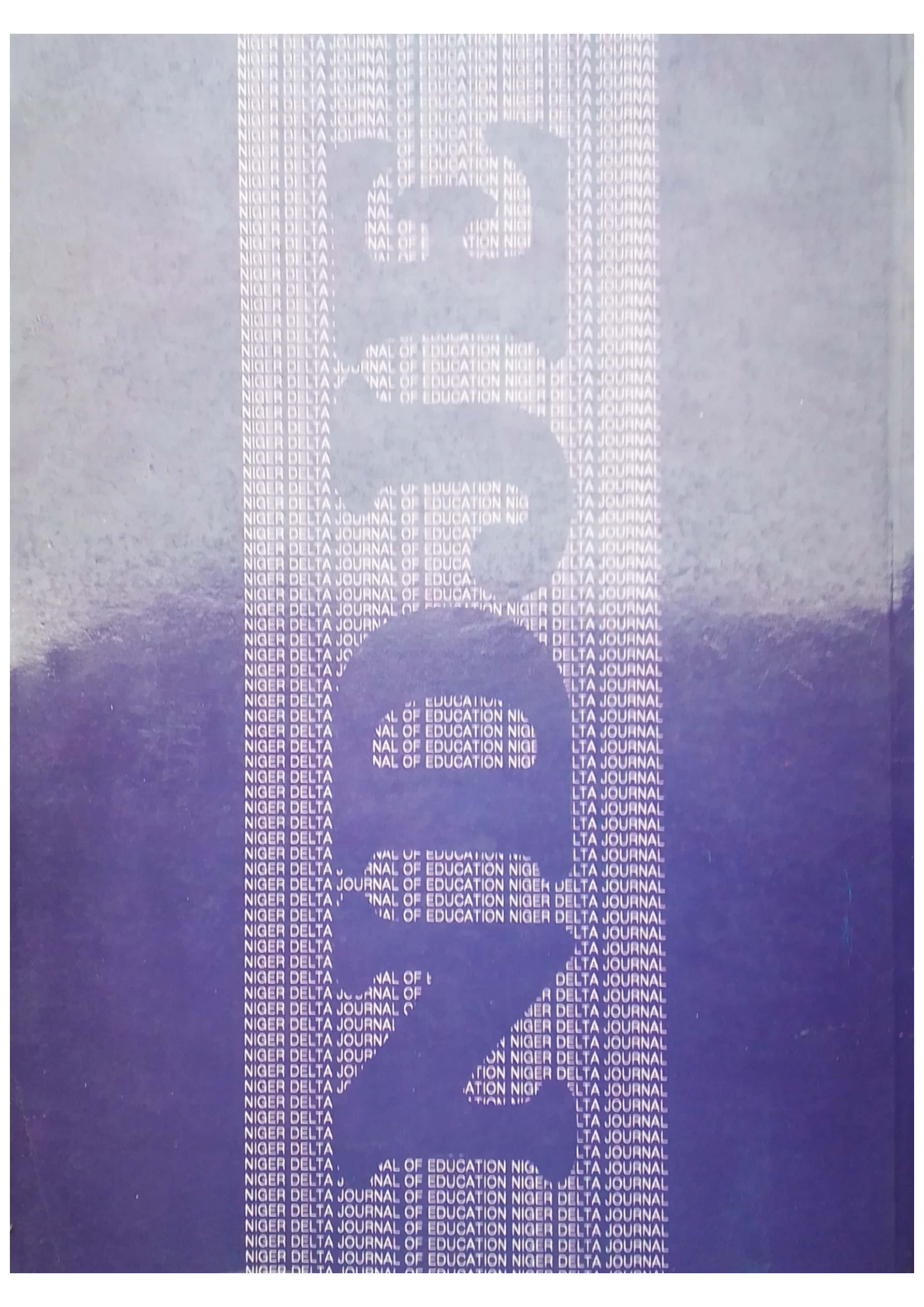
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