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KNOWLEDGE AND IMPACT OF CALABASH CHALK IN PREGNANCY AMONG WOMEN OF CHILD BEARING AGE IN RURAL COMMUNITY IN RIVERS STATE

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Abstract
This study investigates knowledge and impact of calabash chalk in pregnancy among women of child bearing age in Rural Community in Rivers State. Four research questions were formulated in line with the objectives of the study to guide the conduct of this study. This study adopted a descriptive survey. The population of the study included all women of child bearing age residing at Kalaibiama community in Opobo/Nkoro Local Government Area of Rivers State and totaled 160 during the period of conducting this research. A sample size of 160 respondents was used for the study and census sampling technique was used for the study because all the population studied due to its manageable size. The instrument for data collection was questionnaire structured to elicit information from the respondents. Data obtained was subjected to descriptive statistical analysis using the statistical package of social science (SPSS 20.0 version 2010). The results of this study was presented in percentages, and tables. The result of the study showed that an average of 107(66.8%) had poor knowledge regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State, while 53(33.2%) had good knowledge. Hence, knowledge of women regarding the effects of calabash chalk consumption was poor. An average of 113(70.9%) of respondents agreed that they have consumed calabash chalk during their current pregnancy, before becoming pregnant, consumed more than once a week during pregnancy, have consumed throughout all stages of their pregnancy and usually crave for during pregnancy while 233(29.1%) did not, Hence the prevalence and pattern of calabash chalk consumption among the pregnant women was high. Based on the findings, recommendations were made that there should be one-on-one counselling by midwives, nurses or other health professionals for women who reporting consumption of calabash chalk and engagement of community leaders, traditional birth attendants, and women's groups to discourage practice of calabash chalk use among pregnant women.

Introduction

The use of calabash chalk is a common practice among women of child-bearing age, especially during pregnancy (Wikipedia, 2025). Calabash chalk is a naturally occurring clay material traditionally used in parts of West and Central Africa. It goes by several local names—such as Nzu by the Ibos, Ndom by the Efik/Ibibios and Ulo in some parts of Bini, as La Craie or Argile in French, and Mabele in Congo. It is found and obtained usually from the soil (mining pits), and occurs naturally as a light brown to almost white solid which is relatively soluble in water. Calabash chalk is marketed in the raw form or processed by combining clay, sand, wood ash or salt; packaged as powder, molded blocks or pellets and is readily available in open shops (Hawass et al, 2017). It is consumed by many because it is believed to have various ethnobotanical uses. The practice of eating earth, including soil and chalk is known as Geophagia. Geophagia is practiced for various reasons including religious beliefs,

medicinal purposes, or as part of a regular diet. It is a common practice in Nigeria and some sub-Saharan African countries.

According to Abrahams et al (2019), when geophagic materials come in contact with the digestive fluids they have the potential of releasing clinical or sub-clinical toxic effects on the individual. In general, pregnant women gravitate more toward Calabash chalk consumption in humans (Woywod et al, 2022). They use Calabash chalk as remedy for morning sickness and to satisfy their increased appetite and other peculiar desires. Being an earth material, Calabash chalk is not unlikely to be contaminated with microorganisms or heavy metals, which may even increase with processing and or storage. Studies on the analysis of Calabash chalk are currently very few, but the available data indicate that it contains heavy metals whose qualitative and quantitative compositions vary with respect to the geographical location of the chalk (Abrahams et al, 2019).

However, it is believed that aluminum forms one of the major constituents, probably because of the presence of kaolin clay group in most Calabash clay. Others include, lead, arsenic, and chromium (Vermeer & Ferrell, 2018). Recently, the Texas Department of State Health Services and Food and Drug Administration has raised concerns of potential health risks from Calabash chalk consumption, especially by pregnant and breastfeeding women in view of lead and arsenic contamination.(Food and Drug Administration (FDA), 2017). This is important especially as pregnancy is a delicate and vulnerable period, and is generally unsafe for many chemicals. An empirical evaluation of the safety or toxicity profile of the consumption of Calabash chalk during pregnancy is thus justified as currently, not much is known about its effect on pregnancy.

Empirical studies have increasingly documented the toxicological profile of calabash chalk. For instance, Aprioku and Ogwo-Ude (2018) showed that gestational administration of calabash chalk to pregnant Wistar rats led to reduced maternal weight gain, fewer uterine implantations, high pregnancy resorption rates (58%), cases of abortion, and stillbirth — effects that were dose-dependent. In addition, hematological analyses in experimental animals reveal that calabash chalk can significantly disturb blood parameters: non-salted chalk reduced hemoglobin and red blood cell count, while increasing erythrocyte sedimentation rate, suggesting a risk of anemia-like conditions. Developmental problems in children, kidney or neurological damage and pregnancy complications were also effect of calabash chalk. Exacerbating these biological risks, human-based chemical analyses have found that calabash chalk may contain lead concentrations above safe environmental limits.

From a public health perspective, the knowledge about these risks among pregnant women in rural communities appears limited. In a cross-sectional study of pregnant mothers in Southern Nigeria, about 75% admitted to consuming clay during or after pregnancy, with 60% believing it to be harmless. Meanwhile, public health experts continue to raise alarms: physicians warn that chronic ingestion of calabash chalk can lead to lead poisoning, low iron and potassium levels, nerve damage, gastrointestinal inflammation, and anemia in both mother and child.
The cultural persistence of calabash chalk use, combined with the emerging scientific evidence of its toxicity, presents a paradox of traditional belief versus biomedical risk. Understanding the knowledge, attitudes, and practices of women in rural communities regarding this substance is therefore critical. Not only does this insight provide a basis for educational interventions, but it also informs policy

recommendations to mitigate maternal and fetal health risks associated with geophagy. The present study aims to investigate knowledge and impact of calabash chalk in pregnancy among women of child bearing age in rural community in Rivers State.

Statement of the Problem

Calabash chalk, locally known as *nzu*, *eko*, or *ndom*, is a type of edible clay widely consumed by women of reproductive age in several West African rural communities, particularly during pregnancy, due to beliefs that it alleviates morning sickness, nausea, and other gestational discomforts (Alli & Nafiu, 2017; Owhorji, Okon & Osim, 2018). While culturally entrenched, emerging scientific evidence has raised concerns regarding its potential toxicity. Studies have revealed that calabash chalk may contain high levels of heavy metals such as lead and arsenic, along with aluminum, which pose significant risks to both maternal and fetal health (Otobo, Isoje & Igbuku, 2020; Punch Healthwise, 2023).

Despite these findings, there is limited awareness among pregnant women in rural communities about the potential health hazards of calabash chalk consumption. Reports suggest that a significant proportion of women continue to consume it during pregnancy, often under the assumption that it is safe and beneficial (Journal Gizi dan Pangan, 2023). This gap between traditional practices and scientific evidence may lead to adverse outcomes, including anemia, lead poisoning, miscarriage, stillbirth, and impaired fetal development (Aprioku & Ogwo-Ude, 2018; Chika Aliche et al., 2025).

The persistence of calabash chalk use, combined with limited public health education on its risks, underscores the urgent need for research into the knowledge, attitudes, and practices of women of childbearing age regarding calabash chalk consumption in rural communities. Understanding the level of awareness, reasons for consumption, and perceived benefits versus risks is essential for developing culturally sensitive interventions that safeguard maternal and fetal health. Without such interventions, pregnant women may continue to engage in practices that inadvertently compromise their own health and that of their unborn children.

Aim and Objective of the Study

This study investigates knowledge and impact of calabash chalk in pregnancy among women of child bearing age in Rural Community in Rivers State. The study seeks to achieve the following objectives:

1. To assess the level of knowledge among women of childbearing age regarding the potential effects associated with calabash chalk consumption during pregnancy in rural community in Rivers State.
2. To determine the prevalence and patterns of calabash chalk use among pregnant women in rural community in rural community in Rivers State.
3. To determine the effects associated with calabash chalk consumption among pregnant women in rural community in Rivers State.
4. To determine the interventions for the control of calabash chalk consumption among pregnant women in rural community in Rivers State.

Research Questions

1. What is the level of knowledge among women of childbearing age regarding the effects of calabash chalk consumption during pregnancy in rural community of Rivers State?

2. What is the prevalence and pattern of calabash chalk use among pregnant women in rural community of Rivers State?
3. What is the impact of calabash chalk consumption among women of child bearing age in rural community in Rivers State?
4. What are the interventions for the control of calabash chalk consumption among pregnant women in rural community in River State?

Methodology

Research Design

This study adopted a descriptive study which describes knowledge and impact of calabash chalk in pregnancy among women of child bearing in rural community of Rivers State. The researcher collected data, analysed and used its findings and its result for generalization.

Area of Study

The study is conducted in rural community known as Kalaibiama community. Kalaibiama is in Opobo/Nkoro Local Government Area of Rivers State. It is part of the Opobo kingdom, which is a riverine region traditionally inhabited by the Ijaw people, with fishing, fish trading, and small-scale farming serving as the main sources of livelihood. Kailibiama is accessible mainly by water transport**,** and like many riverine settlements, it has limited access to social amenities such as healthcare facilities, good roads, and potable water. Cultural beliefs and traditional practices strongly influence health behaviours in the community, including dietary habits during pregnancy. These factors make Kailibiama a relevant setting for studies on maternal health practices, such as calabash chalk consumption among pregnant women.

Population of Study

The population of the study included all women of child bearing age residing at Kalaibiama community in Opobo/Nkoro Local Government Area of Rivers State and totaled 160 during the period of conducting this research (Kailibiama Women Association Register, 2025).

Inclusive Criteria

Women between the ages of 15-49 years were used for the study.

Exclusive Criteria

Those below the age of 15 were not included in the study.

Sample size

A sample size of the study consisted of 160 women of child bearing culled from the population of the study.

Sampling Technique

Census sampling technique was used for the study because all the population studied due to its manageable size.

Instrument for Data Collection

Primary and secondary method of data collection was used. The primary data collection consisted of questionnaire while secondary source of data collection consisted of internet print out, journals, magazines, textbooks etc. The instrument (questionnaire) was developed by the researcher. The questionnaire was divided into five sections(A–E).

Section A: Contained socio–demographic characteristic of the respondents.

Section B: Contained information on level of knowledge among women of child bearing age regarding the effects of calabash chalk consumption during pregnancy in Rural Community in Rivers State

Section C: Handled information on prevalence and pattern of calabash chalk use among pregnant women in a rural community

Section D: contained information on the impacts of calabash chalk consumption among women of childbearing age in a rural community.

Section E: contained information on interventions for controlling calabash chalk consumption among pregnant women in a rural community.

Validity of the Instrument

Validity is the degree to which a test accurately and meaningfully measures what it is supposed to measure. For the instrument to be validated, questionnaire after drafting was submitted to the project supervisor for vetting, who made necessary corrections to be effected by the researcher. The questionnaire therefore has a face and content validity which make it suitable for the study.

Reliability of the Instrument

Reliability of the instrument is described as the consistency with which an instrument measures the attitude. The reliability of the instrument was determined using the test re-test method. Twenty (20) copies of the instrument were administered to the respondents outside the study area. Two (2) weeks later, the same instrument was re-administered to the same respondents. Hence, a reliability index of 0.8 was obtained making the instrument suitable and reliable for the study.

Method of Data Collection

Copies of questionnaire were administered personally to the respondents by the researcher, and instructions on how to fill the questionnaire was given. Explanations were made where necessary for clarification on the questionnaire. The questionnaire used for the study was anonymous (without respondent names) to retain respondent's confidentiality. Effort was made to collect the questionnaire on the same day so as to ensure high percentage return. 160 copies of the questionnaire were clearly and completely filled given a return rate of 100%.

Method of Data Analysis

Data obtained was subjected to descriptive statistical analysis using the statistical package of social science (SPSS 20.0 version 2010). The results of this study were presented in percentages, and tables.

Ethical Consideration

An official permission was obtained from the CDC chairman of Kailibiama Community to undertake the study. Also, an informed consent was obtained from all the participants of the study. The subjects were chosen according to the criteria and the questionnaire was administered by the researcher to respondents after their consent to participate in the study. The purpose of the study was explained to

all the participants and their consent was obtained. They were assured of strict confidentiality and anonymity.

RESULTS

Table 4.1 Level of Knowledge among women of child bearing age regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State

Item Statement	Yes	%	No	%	Total
Have you heard that consuming calabash chalk during pregnancy can be harmful to the unborn baby?	55	34.3	105	65.7	160(100)
Do you know that calabash chalk may contain harmful substances such as lead or other toxins?	47	29.3	113	70.7	160(100)
Are you aware that eating calabash chalk during pregnancy can affect the growth and development of the baby?	59	36.8	101	63.2	160(100)
Do you know that regular consumption of calabash chalk during pregnancy can cause health problems for the mother?	54	33.7	106	66.3	160(100)
Have you been informed by a health worker that pregnant women should avoid consuming calabash chalk?	51	31.8	109	68.2	160(100)
Average	53	**33.2**	107	**66.8**	

*Good Knowledge. ** Poor Knowledge

Table 4.1 shows level of knowledge among women of child bearing age regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State. The result showed that an average of 107(66.8%) had poor knowledge regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State, while 53(33.2%) had good knowledge. Hence, knowledge of women regarding the effects of calabash chalk consumption was poor.

Table 4.2 Prevalence and Pattern of Calabash Chalk Use among Pregnant Women in a Rural Community

Item Statement	Yes	%	No	%	Total
Have you ever consumed calabash chalk during this current pregnancy?	122	76.2	38	23.8	160(100)
Did you consume calabash chalk before becoming pregnant?	113	70.6	47	29.4	160(100)
Do you currently consume calabash chalk more than once a week during pregnancy?	117	73.1	43	26.9	160(100)
Have you continued consuming calabash chalk throughout all stages of your pregnancy?	106	66.3	54	33.7	160(100)
Do you usually crave calabash chalk during pregnancy?	109	68.1	51	31.9	160(100)
Average	**113**	**70.9**	**47**	**29.1**	

Table 4.2 showed the prevalence and pattern of calabash chalk use among pregnant women in rural community. The result showed that an average of 113(70.9%) of respondents agreed that they have consumed calabash chalk during their current pregnancy, before becoming pregnant, consumed more than once a week during pregnancy, have consumed throughout all stages of their pregnancy and usually crave for during pregnancy while 233(29.1%) did not. Hence the prevalence and pattern of calabash chalk among the pregnant women is high.

Table 4.3 Impacts of Calabash Chalk Consumption among Women of Childbearing Age in a Rural Community

Item Statement	Yes	%	No	%	Total
Have you ever experienced stomach pain or digestive problems after consuming calabash chalk?	43	26.9	117	73.1	160(100)
Have you noticed weakness or tiredness after regularly consuming calabash chalk?	54	33.7	106	66.3	160(100)
Has consuming calabash chalk ever affected your appetite for normal food?	51	31.9	109	68.1	160(100)
Have you been told by a health worker that calabash chalk consumption can cause health problems?	38	23.8	122	76.2	160(100)
Have you experienced any health problems that you believe were caused by consuming calabash chalk?	47	29.4	113	70.6	160(100)
Average	**47**	**29.1**	113	**70.9**	

Table 4.3 showed impact of calabash chalk consumption among women of childbearing age in a rural community. The result showed that an average of 113(70.9%) of respondents disagreed that there is no impact of calabash chalk consumption among pregnancy women such as stomach pain or digestive problems, weakness or tiredness, lack of appetite for normal food. They also said that health workers have not told them about health problem cause calabash chalk consumption and they have never experienced any health problems believed to be caused by consuming calabash chalk and only 47(29.1%) believed that there is impact of calabash consumption among pregnant women. This shows that level of awareness of impact of calabash chalk consumption is in obscurity, the respondents were never told and lacked knowledge, this accounted for massive consumption of calabash chalk among pregnant women in the area.

Table 4.4 Interventions for Controlling Calabash Chalk Consumption among Pregnant Women in a Rural Community

Item Statement	Yes	%	No	%	Total
Have you received health education on the dangers of calabash chalk consumption during pregnancy?	51	31.9	109	68.1	160(100)
Have health workers ever advised you to stop consuming calabash chalk during pregnancy?	58	36.2	102	63.8	160(100)

Were you given nutritional supplements (such as iron or vitamins) to help reduce cravings for calabash chalk?	53	33.1	107	66.9	160(100)
Have community leaders or women's groups discussed avoiding calabash chalk consumption during pregnancy?	45	28.1	115	71.9	160(100)
Have you been encouraged to use safer alternatives to calabash chalk to manage pregnancy cravings?	52	32.5	108	67.5	160(100)
Average	**52**	**32.4**	**108**	**67.6**	

Table 4.4 showed interventions for controlling calabash chalk consumption among pregnant women in a rural community. The result showed that an average of 108 (67.6%) of respondents have not received health education by either health workers or community leaders on the dangers associated with calabash chalk consumption, pushing its consumption rate to be high and only 52(32.4%) agreed of being informed about it.

Discussion of Finding

Finding from this study showed that level of knowledge among women of child bearing age regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State was poor. 107(66.8%) had poor knowledge regarding the effects of calabash chalk consumption during pregnancy in rural community in Rivers State, while 53(33.2%) had knowledge about. Pregnant women in the study area consumed calabash chalk on daily basis, without knowing its effect on their health and that of their unborn babies. This finding consolidates the work of Madziva et al (2020) who conducted a study in London, United Kingdom**,** exploring the perceptions and practices regarding geophagia (including calabash chalk) among Black African migrant women during pregnancy discovered that very few participants expressed concern about the safety of clay consumption; most considered it culturally normal and beneficial, particularly for alleviating nausea and providing minerals and awareness of potential toxic effects, such as lead exposure or microbial contamination, was very limited. This study also corroborates with the work of Onyenweaku et al. (2023) who conducted a cross-sectional survey among pregnant women attending antenatal clinics in Onitsha and Ogidi, in collaboration with hospitals in Calabar, Cross River State and discovered that approximately 75% of participants admitted to consuming clay during pregnancy. While some women were aware that the practice might have negative consequences, most perceived it as harmless or beneficial, and the level of knowledge regarding specific toxicological risks, such as lead exposure, was generally low. It shows that a lot of women do not know the potentiality effects of consuming calabash chalk even during pregnancy, and therefore making its consumption to be a wholesome exercise.

Further findings for this study prevalence and pattern of calabash chalk use among pregnant women in a rural community showed that an average of 113(70.9%) of respondents agreed consuming calabash chalk throughout all stages of their pregnancy and usually crave for during pregnancy while 47(29.1%) did not. This study is in consonance with the work of Onyenweaku et al. (2023) who conducted a study in Onitsha, Ogidi, and Calabar, Nigeria and discovered that about 75% of participants admitted to consuming edible clays, including calabash chalk, patterns varied, with some women consuming it routinely and others occasionally. Knowledge of potential toxic effects was generally low. This shows

that calabash chalk consumption is widespread in communities, and there is a need for targeted maternal health education and counseling.

Finding from this study showed impact of calabash chalk consumption among women of childbearing age in a rural community. The result showed that an average of 113(70.9%) of respondents believed that there is no impact of calabash chalk consumption among pregnancy women and only 47(29.1%) believed there is impact. This finding contradict the study of Aprioku & Ogwo-Ude, (2018) that Calabash chalk has been found to contain several hazardous heavy metals, the most significant being lead (Pb), arsenic (As), cadmium (Cd), and mercury (Hg) and these metals can enter the bloodstream after ingestion and pose serious health risks, particularly to pregnant women and developing fetuses. The impact is obvious but since most pregnant women are not aware, they see its consumption as beneficial to their health and that of their unborn babies.

Finding from the study further showed that interventions for controlling calabash chalk consumption among pregnant women in a rural community was not yet received and practiced. The result showed that an average of 108 (67.6%) of respondents have not received interventions and controlling techniques for the prevention of calabash chalk consumption and only 52(32.4%) agreed of being educated on it. This study is in line with the Studies of Abrahams, (2018) that misconceptions about the medicinal or nutritional value of calabash chalk persist strongly in rural populations, where access to antenatal health information may be limited. Also, Bonglaisin et al., (2018) & WHO, (2020) lend their voices that without targeted education, women may unknowingly expose themselves and their unborn children to toxic substances that incurred through calabash chalk consumption, which can impair fetal neurodevelopment, contribute to maternal anaemia, or increase the risk of pregnancy complications.

Conclusion

Calabash chalk (also known as *nzu*, *mabele*, or *Calabar stone*) is a form of edible clay that many pregnant women in parts of Africa consumes, often believing it helps relieve nausea, morning sickness, or provides minerals. However, this practice carries significant health risks. Calabash chalk often contains high levels of toxic heavy metals, including lead, arsenic, and nickel. Lead is of particular concern because it can cross the placenta and harm fetal neurodevelopment. Additionally, chalk may harbour microbial pathogens (bacteria, fungi, parasites) that could infect both mother and baby. Chronic consumption has also been linked to health problems such as anaemia, low iron, muscle weakness, nerve damage, and kidney problems. Calabash chalk exposure resulted in inhibited maternal weight gain, fewer implantations, miscarriages, and stillbirths. Pregnant women are advised against using calabash chalk, citing its toxic lead content and potential harm to fetal growth and neurodevelopment. In short, while calabash chalk is used culturally as a remedy during pregnancy, the evidence strongly suggests it poses serious health risks to both mother and child.

Recommendations

Based on the finding the following recommendations were made:

1. There should be routine **s**creening for calabash chalk use during antenatal visit.
2. There should be integration of integration of calabash chalk education into antenatal health talks.
3. There should be one-on-one counselling by midwives or nurses for women who report consumption of calabash chalk.

4. There should be provision of iron and micronutrient supplements, since deficiencies often trigger cravings.
5. Engagement of community leaders, traditional birth attendants, and women's groups to discourage the practice of calabash chalk use.
6. There should be involvement of husbands and family members in health education to reduce social encouragement of consumption and also community dialogues to address cultural beliefs supporting calabash chalk use.
7. Use of posters, flyers, and radio messages emphasizing "safe pregnancy practices" and testimonies from women who stopped consuming calabash chalk and experienced better health outcomes.
8. There should be collaboration with local authorities to discourage sale of calabash chalk near health facilities and markets.
9. Sensitization of vendors on the health risks associated with selling calabash chalk to pregnant women should be carried out.
10. Community health workers should conduct home visits for high-risk women.

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