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AWARENESS OF RHESUS FACTORS AND AVAILABILITY OF SCREENING FACILITIES AMONG ADOLESCENT STUDENTS OF REPRODUCTIVE AGE IN TERTIARY INSTITUTIONS, OSUN STATE, NIGERIA

Adekunle, Phebian Funmilayo[1],
Akinnubi, Caroline Funmbi[2],
Babalola, Afeez Olayinka[3],
Fatgbeja, Oluwaseyi Babajide[4],
Agboola, Funmiayo Folasade[5i]
[1]PhD,
Department of Public Health,
University of Ilesa, Ilesa,
Nigeria
[2]PhD,
Department of Kinesiology and Health Education and Recreation,
Obafemi Awolowo University Ile-Ife,
Osun State, Nigeria
[3]M.A.,
Department of Health Education,
University of Ilesa,
Ilesa, Nigeria
[4]M.A.,
Department of Health Education,
University of Ilesa,
Ilesa, Nigeria
[5]M.A.,
Department of Human Nutrition and Dietetics,
University of Ilesa,
Ilesa, Nigeria

Abstract:
The study specifically assessed the awareness of Rhesus factors and the availability of screening facilities among female and adolescent students of reproductive age in tertiary institutions. The population for the study was female students of reproductive age in tertiary institutions in Osun State. A descriptive research design was adopted for the study. A multi-stage random sampling technique was used for the respondents' selection. Data were collected from one thousand two hundred (1,200) respondents in

[i] Correspondence: email funmilayo_adekunle@unilesa.edu.ng, fakinnubi@yahoo.com, afeez_babalola@unilesa.edu.ng, fagbeja@gmai.com, funmilayoa593@gmai.com

only one of the three senatorial districts in Osun State, with three senatorial districts in Osun State, with the use of a self-designed questionnaire. Experts validated this. The test-retest method was used for the reliability of the instrument and found to be reliable at a 0.87 level of significance. Two objectives, which were transformed into two research questions, were raised with one hypothesis. Data were analyzed using frequency count, percentages, and the chi-square test was used to analyze the hypothesis formulated. Findings revealed that the respondents were aware of the Rhesus factor, but were not aware of the availability of screening facilities for the Rhesus factor. Finally, there was no significant relationship between the awareness level of the Rhesus factor and the awareness level of the availability of screening facilities among adolescent students of reproductive age in tertiary institutions. It is recommended that the government and non-governmental organizations should intensify awareness programmes and sensitize the students through educational materials, workshops, campaigns, seminars, and mass media about the need for reproductive health-related issues.

Keywords: awareness level, Rhesus factors, availability, screening facilities, students, reproductive health

1. Introduction

The Rhesus factor is very important in the lives of pregnant females. It is described as a protein found on the red plasma cells of individuals. Therefore, female individuals are either positive (containing protein in their blood) or negative (not containing protein in their blood). The Rhesus factor is principally significant during pregnancy among females because the failure of the mother to have the Rhesus factor, meaning inconsistency between the mother and the fetus, can lead to complications. According to the World Health Organization (2020), the Rhesus factor is a protein that is present on the external surface of red blood cells in the body. It is important for the fact that it is blood compatible.

The Rhesus factor is genetic in nature because it is directly inherited from parents. World Health Organization (2020), Thommesen & Visser (2021), Mount Sinai (2022), KidsHealth (2024), NHS (UK) (2024) expressed that there is no issue if both parents are Rhesus-positive or Rhesus-negative. Rhesus incompatibility occurs when the mother has Rhesus incompatibility.

A mother with Rhesus-negative blood and a fetus with Rhesus-positive blood can have serious medical complications. These complications can cause hemolytic disease of the newborn (HDN), leading to ill health of the baby when not addressed promptly (Otomewo *et al.*, 2020; Britannica, 2024). The presence or absence of the Rhesus factor is an issue in blood typing, which is presented as Rhesus-positive (+) or Rhesus-negative (-). Obeagu *et al.* (2024) stated that a lack of awareness or knowledge about the Rhesus factor can result in consequences during pregnancies, thereby affecting the health of both

mother and baby. Wikipedia (2022) and Opoku *et al.* (2024) affirmed that a lack of awareness and knowledge of the Rhesus factor and its likely influence on future pregnancy outcomes among people could lead to medical challenges. The Rhesus factor has an influence on family planning decisions, prenatal care, and the overall well-being.

According to the American Pregnancy Association (2022), pregnancies with rhesus-positive babies' antibodies can lead to difficulties such as hemolytic disease of the newborn (HDN). Investigations on the awareness of vital aspects of reproductive health employed numerous methodologies, such as surveys, interviews, and educational interventions, to gauge the depth of knowledge among undergraduate populations. Magaji *et al.* (2020) and Mashi *et al.* (2023) claimed that there are variations in the level of awareness across different demographics, such as gender, cultural background, and academic majors. Certain groups may exhibit higher awareness levels, emphasizing the influence of socio-cultural factors on Rhesus factor knowledge. Cultural factors can influence how information about the Rhesus factor is received and retained. Societal stigmas, misconceptions and taboos surrounding discussions on reproductive health can also hinder open dialogue, potentially limiting the dissemination of accurate information, leading to lower levels of awareness among certain groups.

Magaji *et al.* (2020) and Mohammud *et al.* (2022) expressed that a well-informed undergraduate population contributes to a healthier society by reducing the incidence of preventable complications associated with Rhesus incompatibility during pregnancy, consequently alleviating the burden on healthcare systems and promoting a culture of responsible reproductive health practices. According to Cleveland (2021), immunoglobulin injection is usually given to pregnant women with negative Rhesus for stopping the growth of antibodies against Rhesus-positive blood cells. At the same time, Kanko and Woldemariam (2021) stated that an education programme comprising workshops and educational quality materials resources that are available on campuses also helps the students to access and comprehend information about the Rhesus factor and to create awareness. Nevertheless, a lack of access to healthcare resources can hinder Rhesus compatibility and, thereby, lead to delayed awareness and intervention (Stanford Medicine Children's Health, 2024).

Bassey *et al.* (2021), Anyiam, *et al.* (2023), WebMD (2022), Maro (2022) affirmed that accessibility of students to Rhesus screening may be subjective by various factors, such as geographical setting, financial limitations, and responsiveness of the importance of screenings and cost of Rhesus screening tests and the linked healthcare services might present obstacle for students particularly those lacking adequate health insurance coverage or economic incomes.

2. Statement of the Problem

The Rhesus factor is characterized as a protein found on the surface of red blood cells. Female individuals are either positive (having protein in their blood) or negative (having

no protein in their blood). This factor is particularly important during pregnancy because the inability of the mother to have the Rhesus factor, meaning inconsistency between the mother and the fetus, can lead to complications. Consequently, the adolescent females need to take care of themselves for the unforeseen negative issues so as to guard against complications when the time of being mothers in the future.

There is, therefore, a need to examine the Rhesus factor among adolescents in institutions; hence, this study.

2.1 Objectives of the Study

1) Determine the awareness of Rhesus factors among adolescent students of reproductive age in tertiary institutions in Osun State.
2) Examine the awareness of the availability of screening facilities among adolescent students of reproductive age in tertiary institutions in the study area.

2.2 Research Questions

1) Are the adolescent students of reproductive age aware of Rhesus factors in tertiary institutions in Osun State?
2) Are the adolescent students of reproductive age aware of the availability of screening facilities in tertiary institutions in the study area?

2.3 Research Hypothesis

Research Hypothesis 1: There is no significant relationship between awareness of the Rhesus factor and awareness of the availability of screening facilities among adolescent students of reproductive age in tertiary institutions in Osun State.

3. Methodology

The study employed a descriptive research design. A total of all female students of productive age at higher institutions were the respondents. A multistage random sampling technique was used in the selection of the respondents. A simple random sampling technique was used in the selection of tertiary institutions, faculties and departments, while an accidental sampling technique was used in selecting women of reproductive age. Data were collected from one thousand and two hundred (1,200) respondents through a self-designed and validated questionnaire by experts in the area of research study. The test-retest method of reliability was employed, and a reliability correlation coefficient of 0.87 was obtained using Spearman's correlation formula. The research question was divided into two sections (A and B). Section A was for the demographic section, while Section B elicited information for the objectives/research questions formulated. Two research questions and one hypothesis were raised. Data were collected with the help of 6 trained research assistants. Data were analyzed using

frequency count and percentages, while Chi-Square was used in testing the formulated hypothesis at a 0.05 level of significance.

4. Results

Research Question 1: Are the adolescent students of reproductive age aware of Rhesus factors in tertiary institutions, in Osun State?

Table 1: Respondents' respondents on awareness of Rhesus factors among adolescent students of reproductive age in tertiary institutions, in Osun State

S/N	Items	Agree	Disagree
1.	The presence or absence of the Rhesus factor is genetic in nature, and there is no issue if both parents are Rhesus-positive or Rhesus-negative on the component of blood typing.	950 (79.17%)	250 (20.83%)
2.	Engagement in educational workshops, campaigns, online educational modules and seminars may not necessarily enhance comprehension and retention of Rhesus factor knowledge.	300 (25%)	900 (75%)
3.	If fetal blood, which may be Rhesus-positive, enters the maternal bloodstream during pregnancy or childbirth, the mother's immune system may develop antibodies against the Rhesus factor.	985 (82.08%)	215 (17.92%)
4.	A Rhesus-negative mother and a Rhesus-positive fetus may not lead to serious complications for the well-being of both mothers and baby during pregnancy.	895 (74.58%)	305 (17.92%)
5	Rhesus factor incompatibility may not be an issue in the field of blood transfusions, organ transplants, and pregnancy care.	950 (79.17%)	250 (20.83%)

The table above shows that the majority (79.17%) of the respondents agreed that the presence or absence of the Rhesus factor is genetic in nature. There is no issue if both parents are Rhesus-positive or Rhesus-negative on the component of blood typing. In comparison, 75% disagreed with the statement that engagement in educational workshops, campaigns, online educational modules and seminars may not necessarily enhance comprehension and retention of Rhesus factor knowledge. The majority (82.08%) of the respondents agreed that if fetal blood, which may be Rhesus-positive, enters the maternal bloodstream during pregnancy or childbirth, the mother's immune system may develop antibodies against the Rhesus factor. In the same vein, 74.58% agreed that a Rhesus-negative mother and a Rhesus-positive fetus may not lead to serious complications on the well-being of both mothers and babies during pregnancy. In comparison, 79.17% disagreed with the statement that the Rhesus factor may not be an issue in the field of blood transfusions, organ transplants, and pregnancy care.

Research Question 2: Are the adolescent students of reproductive age aware of the availability of screening facilities in tertiary institutions in the study area?

Table 2: Respondents' responses on the awareness of the availability of screening facilities among adolescent students of reproductive age in the study area

S/N	Items	Agree	Disagree
1.	Blood test and Rhesus factor screening facilities are readily available to students in the State.	200 (16.67%)	1000 (83.33%)
2	Accessibility of Rhesus screening facilities to students may be influenced by various factors, including geographical location, cultural values and awareness of the importance of such screenings.	250 (20.83%)	950 (79.17%)
3.	The cost of Rhesus screening tests and associated healthcare services may equally present a barrier for some students.	950 (79.17%)	250 (20.83%)
4.	Stress, depression, anxiety and other unfavourable medical conditions are associated with the uncertain compatibility ambiguity surrounding Rhesus status and screenings.	214 (17.83%)	986 (82.17%)
5.	Many students feel unconcerned about the Rhesus factor and are not ready to go for screening.	940 (78.33)	260 (21.67%)

Table 2 revealed that the majority (83.33%) of the respondents disagreed that Blood test and Rhesus factor screening facilities are readily available to students in the state, while 79.17% equally disagreed that various factors, including geographical location, cultural values and awareness of the importance of such screenings, may influence accessibility of Rhesus screening facilities to students**.** Only 20.83% of the respondents disagreed that the cost of Rhesus screening tests and associated healthcare services may present a barrier for some students, while 82.17% also disagreed that stress, depression, anxiety and other unfavourable medical conditions are associated with the uncertain compatibility ambiguity surrounding Rhesus status and screenings. Finally, the majority of the respondents (78.33%) agreed with the statement that many students felt unconcerned about the Rhesus factor and are not ready to go for screening.

4.2 Hypothesis Testing

Research Hypothesis 1: There is no significant relationship between awareness of the Rhesus factor and awareness of the availability of screening facilities among adolescent students of reproductive age in tertiary institutions in Osun State.

Table 3: X^2 Calculation on respondents on the significant relationship between awareness of the Rhesus factor and awareness of the availability of screening facilities among reproductive-age female students in tertiary institutions in the study area

X^2 cal	X^2 table	Df	Sig	Decision
5,828	3.492	4	0.05	Accepted

This table revealed a higher calculated value of 5,828 as against a table value of 3.492, df = 4, at a 0.05 level of significance. The hypothesis stating that there is no significant relationship between awareness of the Rhesus factor and awareness level of availability of screening facilities among reproductive age female students in tertiary institutions was accepted. This implies that there was no significant relationship between the awareness

level of the Rhesus factor and the awareness level of the availability of screening facilities among adolescent students of reproductive age in tertiary institutions

5. Discussion of Findings

From the study, it was observed that the majority of the respondents (79.17%) agreed that the presence or absence in the same vein, majority (75%) disagreed with the statement that engagement in educational Workshops, Campaigns, Online Educational Modules and Seminars may not necessarily enhance comprehension and retention of Rhesus factor knowledge. This is in agreement with the submissions of Hroob *et al.* (2020), Kanko, and Woldemariam (2021), Science Direct (2023), who stated that the quality of educational materials, workshops, and resources available on campuses also influences the extent to which students can access and comprehend information about the Rhesus factor.

Majority (82.08%) of the respondents agreed that if fetal blood, which may be Rhesus-positive, enters the maternal bloodstream during pregnancy or childbirth, the mother's immune system may develop antibodies against the Rhesus factor which was also in agreement with that of University of Rochester Medical (2022), MedicineNet (2023) who expressed that if fetal blood, which may be Rhesus-positive, enters the maternal bloodstream during pregnancy or childbirth, the mother's immune system may develop antibodies against the Rhesus factor. In the same vein, the majority (74.58%) agreed that a Rhesus-negative mother and a Rhesus-positive fetus may not lead to serious complications on the well-being of both mothers and babies during pregnancy. The above disagreed with the assertions made by Oboh & Adeleke (2021), Ochonogor *et al.* (2021), and American Pregnancy Association (2022), who discussed complications such as hemolytic disease of the newborn (HDN), where the mother's antibodies attack the red blood cells of the Rhesus-positive fetus. Also 79.17% agreed with the statement that Rhesus factor may not be an issue in the field of blood transfusions, organ transplants, and pregnancy care which is in deviates with that of Cleveland Clinic (2021), Mazadu and Buhari (2023), Ransom, Children's Wisconsin (2024) who claimed that Rhesus factor is crucial in the field of blood transfusions, organ transplants, and pregnancy care, as it helps prevent complications related to Rhesus incompatibility.

Other findings stated that the majority (83.33%) of the respondents disagreed that blood test and Rhesus factor screening facilities are readily available to students in the state, while 79.17% equally disagreed that various factors, including geographical location, cultural values, and awareness of the importance of such screenings, may influence accessibility of Rhesus screening facilities to students. These findings were in contrast with that of Bassey, *et al.* (2021), Anyiam, *et al.* (2023), WebMD (2022), Maro (2022) who affirmed that accessibility of Rhesus screening facilities for students may be influenced by various factors, including geographical location, financial constraints, and awareness of the importance of such screenings and that the cost of Rhesus screening

tests and associated healthcare services may equally present a barrier for some students, especially those without adequate health insurance coverage or financial means.

Further findings stated that the majority of the respondents (82.17%) disagreed that anxiety, ambiguity surrounding Rhesus status, and uncertainty emerge as key psychological factors in Rhesus factor screenings. This contradicted the submissions of Ochonogor *et al.* (2021). American Pregnancy Association (2022), who pointed out that stress, depression, anxiety and other unfavourable medical conditions are associated with the uncertainty of Rhesus compatibility, can affect individuals' overall well-being.

6. Conclusion

This study, based on its findings, concluded the following:

Respondents needed to be sensitized on health information through information resources for the effectiveness of the Rhesus factor, the cost of Rhesus screening tests and associated healthcare services that may present a barrier for some students.

Awareness should also be raised among students to undergo Rhesus factor screening.

6.1 Recommendations

Based on the findings, the following recommendations were made:

1) Current and correct information on the Rhesus factor should be made available on TV, the Internet and other media commonly utilized by students.
2) Current awareness programmes through educational materials, workshops, campaigns and seminars should be mounted to sensitise students about the need to pay attention to their reproductive health-related issues.
3) Current research findings should be made available to students of reproductive age right from secondary schools.
4) Government and non-governmental organizations should intensify efforts on public and Institutional sensitization programmes.
5) Rhesus factor screening facilities should be made available, accessible and free at all educational levels in Nigeria.

Conflict of Interest Statement

The authors declare no conflicts of interest.

About the Author(s)

Dr. Akinnubi, Caroline Funmbi is a reader and a lecturer in the university. Her research interests are Personal and Environmental Hygiene Education, Reproductive Health Education, Community and Public Health Education. She has participated in local and international conferences.

Dr. Adekunle, Phebian Funmilayo is a reader and a lecturer in the university. Her research interest is generally health education. She has participated in local and international conferences.

Agboola, Funmiayo Folasade is a senior lecturer in the university and her research interest is also health. She has attended local conferences.

Babalola, Afeez Olayinka and **Fatgbeja, Oluwaseyi Babajide** are also assistant lecturers in the university and their research interest is also health. They have participated in local conferences.

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