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Students' Perceptions of Biology Literacy and Common Hygiene Practices in Senior Secondary Schools in Ilorin Metropolis, Kwara State

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Abstract
This study explored how senior secondary school students in Ilorin Metropolis, Kwara State, perceive their knowledge of biology and how this understanding relates to their everyday hygiene practices. Using a descriptive survey approach, the research examined the extent to which students' grasp of biological principles impacts behaviours related to personal and environmental hygiene. A total of 100 students were selected from ten randomly chosen secondary schools within Ilorin West Local Government Area. Data were gathered through a validated questionnaire comprising both demographic details and opinion-based items measured on a four-point Likert scale. Findings indicated that a large proportion of the students displayed a reasonable level of understanding in key biology topics such as cell biology, photosynthesis, and genetics. This knowledge appeared to influence positive hygiene habits, including regular handwashing, nail trimming, safe food handling, and proper respiratory etiquette. For example, 81% of the respondents reported a good understanding of photosynthesis, while 74% stated that they consistently clean their personal items. Despite this, a considerable number of students still showed gaps in their biological understanding and neglected some essential hygiene practices, particularly those concerning food safety and genetic awareness. The results highlight the need to enhance the biology curriculum with more practical, health-oriented applications. Strengthening the connection between classroom instruction and real-world health practices could significantly improve students' hygiene behaviour. The study recommends adopting interactive and applied learning techniques to foster both scientific literacy and healthy living habits among students.

Keywords: Biology literacy, Student hygiene, Health behaviour, Secondary education, Ilorin Metropolis.

Introduction
Biology as one of the science subjects offered in senior secondary schools deals with the scientific study of living things, their relationship with one another and with the natural environment among other things. It is a core subject in Nigerian secondary school curriculum which is introduced to students at the senior secondary school level as a preparatory ground for human development, where career abilities are groomed, potentials and talents discovered and energized. However, Biology as a unified science first developed in the nineteenth century, as scientists discovered that all living things shared certain fundamental characteristics and were best studied as a

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whole. Nlewem (2022) has asserted that today, Biology is one of the most prominent scientific fields; biology is a standard subject of instruction at schools and universities around the world. As a vast field, biology is divided into a number of sub disciplines (Onyegegbu, 2022).

The old division by types of organisms' remains with subjects such as Botany, encompassing the study of plants; Zoology with the study of animals, and Microbiology as the study of microorganisms. The field may also be divided based on the scale at which it is studied; molecular biology looks at the fundamental chemistry of life; cellular biology considers the basic building block of all life, the cell physiology looks at the internal structure of organisms, and ecology considers how various organisms are interrelated. (Akintola, 2017)

Generally, similar plants or animals are arranged in particular groups, some special branches of Biology have been created on the basis of different types of living things under discussion and research. For example, phycology includes only members of algae; fungi are treated in mycology; virology deals with viruses only; bacteria are considered in bacteriology; helminthological is based on study of worms only; insects are discussed in entomology. According to Brook (2022), applied field of Biology such as medicine are more complex and involve many specialised sub disciplines. Biology is the science that explores life forms, and as such, not only extends our knowledge and understanding of the natural world, including ourselves, but can also increase our sensitivity, enjoyment and concern for the natural world. According to Hodson (2022), plant, animals and the human form have inspired all world cultures in many ways, for instance in literature and particularly in art, as well as in science. Thus, Biology should not be seen as a cold, insensitive activity but one, which must demand a developing empathy with the natural world.

According to Akhigbe et. al. (2022) Biology is a science that studies living things; which involves plants and animals. If science is defined as the study of natural world, biology focuses on the systematic study of the living world. As a result of its importance, the subject Biology is one of the core subjects in senior secondary schools' curriculum in Nigeria. Biology is important in school curriculum and serves as a foundation to several courses and careers such as medicine, which included Ophthalmology, Morphology, and Anatomy, physiology, Hematology, Dentistry,

However, Jolaosho, (2022) Biology is the science of life that studies living matter, structure, function and behaviours of organism. It is concerned with evolution, distribution and taxonomy of life. The importance of biology in the industrialization and other sector of the economy cannot be overemphasized. As a matter of fact, it is a prerequisite for pursuing a number of careers in sciences which include medicine, pharmacy, biochemistry, botany, nursing, zoology among others.

Biology remains one of the basic sciences whose teaching and learning is universally known to be efficient and successful, if only undertaken simultaneously with the help of adequate instructional resources and facilities (Ezenwabodo, 2024). Biology plays a vital role in the field of biochemistry, medicine, physiology, ecology, genetics, and molecular biology and as such, biology has been made a central focus in most human activities including being a solution to the problem of food scarcity, health, hygiene, family life, poverty eradication, management and conservation of natural resources,

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biotechnology, ethics, various social vices and as well lack of appropriate infrastructural materials (Zebo, 2024).

Biology literacy is needed in Nigeria being one of the developing countries of the world where citizens are called upon to make decisions involving curriculum development and implementation, the environment, society, the economy, national defense and population control. International Council on submitted that biology knowledge can lead to improvement in many spheres of society including social, economic, political and cultural life. As a result of this, the importance of biology literacy cannot be ruled out. Nwagbo and Adam (2022) submitted that a biology literate person should regard controversies in areas such as agriculture, pollution, conservation or medicine as something one need to sufficiently understand in order to make informed decisions about such as: whether to apply fertilizers to crops whether to site industries near residential areas and whether to support abortion or mercy killing. Biology is one of the science subjects taught in senior secondary schools in Nigeria. It is the science subject that deals with the study of life. And everyone who needs life needs the knowledge of Biology that is, needs to be literate in Biology. (Akintola, 2017)

Biology literacy refers to the ability to understand and apply fundamental biological concepts and principles. It involves not only having knowledge about biological facts but also being able to use this knowledge to make informed decisions, understand real-world issues, and appreciate the diversity and complexity of life. Biology can be defined as the science of life. It is a science subject offered in all the senior secondary schools in Nigeria, which is compulsory for both the science, and Arts oriented students. Odo (2022) pointed out that, the teaching of biology is important because, it equips the students to comprehend the world around them and equips them with necessary skills to build a progressive society. Similarly, Odo (2022) observed that, biology provides a platform for teaching students the ability to apply learning of science concepts and principles in solving every day's problems.

Biology has a role to play in Agriculture, Environmental control, population control, pharmacy, Laboratory analysis and in some areas of biology such as Anatomy, Botany, Zoology, Biological Science, Genetics, Ecology and others. Biology enables one to become more aware of one's changing environment such as effect of drought on plants, explores it and adapt to it better (Abula, 2017).

Biology is one of the science subjects that senior secondary students offer in senior secondary certificate examinations in Nigeria (FRN, 2014). Interestingly, it is a popular subject among students and its popular nature among other science subjects has made it distinct choice for all students (Lawal, 2015). Biology is a very important science subject and a requirement for further studies of other science related professional courses such as medicine, agriculture, pharmacy, biotechnology, genetic engineering, etc. Biology is the key to economic, intellectual, sociological, human resource development and wellbeing of any society. It is of importance in many ways for both individual and societal development as seen in biotechnology and genetic engineering (Chukwuneke, 2015). Based on these assertions on the importance of biology, there is need for it to be properly taught in the secondary schools to improve students' achievement in the subject.

Education at secondary school level according to Ashikhia (2021) is supposed to be the bedrock and the foundation towards higher knowledge in tertiary

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institutions. Secondary schools not only occupy a strategic place in the educational system in Nigeria, it is also the nexus for primary and the university levels of knowledge.

In spite of the importance and acceptance of Biology among Nigerian students, performance at senior secondary school level has been fluctuating and sometimes below average. These performances stem from various factors which include poor school management, but more prevalently low teachers' quality, poor teachers' preparation and inappropriate use of pedagogical skills. Also mentioned were ineffective use of instructional materials, lack of classroom management as well as poor understanding of content concepts by teachers, etc. (Diana, 2019). From the above, one can infer that teacher's pedagogical and content knowledge is adequately and effectively needed to improve students' academic performance. Pedagogical and content knowledge as the ability of teachers to understand a specific discipline along with teaching of that discipline. However, recent reports proved otherwise as there have been inconsistency in candidates' performance in Senior Secondary Certificate Examinations (SSCE) (Anakara, 2021)

Biology literacy refers to the understanding and application of biological concepts, principles, and processes. It encompasses the ability to use biological knowledge to make informed decisions, understand current issues, and appreciate the complexity and diversity of life. Biology literacy is essential for students to navigate and understand the biological aspects of the world around them. Biology literacy is crucial for understanding the living world and making informed decisions that affect personal health, society, and the environment. By fostering a comprehensive understanding of biological concepts and promoting critical thinking, education systems can prepare students to face the challenges of the modern world with confidence and responsibility. (Diana, 2019).

Biology literacy and hygiene behaviour are critical components of a student's education, particularly in senior secondary schools where foundational knowledge and habits are formed. This study aims to assess the level of biology literacy and hygiene behaviour among senior secondary school students in Ilorin Metropolis, Kwara State. (Abdul, 2022). Personal hygiene refers to the set of practices that help maintain good health and prevent the spread of diseases. This involves regular washing of the body, hands, trimming of the nails, washing clothes, washing the hair and brushing the teeth. In schools, students spend most of their time closer to each other, resulting in rapid transmission of infections, due to their naturally weak immune system and lack of knowledge of basic hygiene practices.

According to Miller (2020) biology literacy deals with acquisition of biological attitudes, skills and knowledge that allow people to participate in biological debates and develop problem-solving skill and decision making skills in their everyday lives. This definition is in line with the new senior secondary biology curriculum (2022) .Therefore the framework of working the concepts of biology literacy was based on this theory.

Students' hygiene refers to the practices and habits that students adopt to maintain cleanliness and promote health. It encompasses personal hygiene, environmental hygiene, and food hygiene, all of which are crucial for preventing illness and fostering a

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conducive learning environment. Hygiene therefore plays an essential role in the prevention of communicable diseases. These pathologies are the cause of absenteeism (75% in Malaysia in 2019), resulting in working time loss for parents, significant medical expenses due to medical visits and antibiotic prescriptions. More than 1.9 billion school days could be gained if the supply of drinking water, sanitation were achieved and the incidence of diarrhea diseases would be reduced. The provision of drinking water and sanitary facilities at schools contribute to improved personal hygiene with a positive impact on the health of students. (Diana, 2019).

Students' hygiene behaviour refers to the actions and practices adopted by students to maintain cleanliness and promote health in their daily lives. This encompasses a wide range of activities related to personal hygiene, environmental hygiene, and food hygiene. Regular washing of hands with soap and water, particularly before eating, after using the restroom, and when hands are visibly dirty, brushing teeth at least twice a day, flossing, and regular dental check-ups. Taking regular showers or baths to keep the body clean and reduce the risk of skin infections. (Ademola, 2023). These biological attitudes and skills are developed through practical work and acquisition of biological knowledge would be through proper teaching methods.

In line with this, the knowledge to be taught, the performance objectives, the biological attitudes and skills to develop in students, the teaching and learning materials to be used and the evaluation guide are fully set out in the curriculum. From the contents in biology curriculum, one would conclude that if the students are properly taught and are motivated towards the acquisition of biology literacy all the students will be able to apply the biological knowledge to everyday life in matters of personal and community health, live effectively within one's immediate environment and the modern world and also apply biological knowledge to solve problems. This is in support of Abimbola (2019), Nwagbo and Adams (2012) who submitted that students should be able to make connections between what they learn at school and how it can be applied to their everyday life. Based on the reviewed literature, the investigated Biology students' perceptions on Biology literacy and common hygiene practice in secondary school in Ilorin Metropolis, Kwara State.

Purpose of the Study

The main purpose of the study was to investigate Biology students' perceptions on Biology literacy and common hygiene practice in secondary school in Ilorin Metropolis, Kwara State. Specifically, the study was to;

i. determined the level of Biology literacy among senior secondary school students in Ilorin Metropolis;
ii. find out the common hygiene practices among senior secondary school students in Ilorin Metropolis.

Research Questions

i. What is the level of Biology literacy among senior secondary school students in Ilorin Metropolis?
ii. What are the type of personal hygiene habits among adolescents senior secondary school.

Methodology

The study adopted a descriptive survey on students' Perceptions of Biology Literacy and Common Hygiene Practices in Senior Secondary Schools in Ilorin Metropolis,

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Kwara State. Descriptive survey was adopted because it allows researchers to gather detailed information about a population or a particular phenomenon. This type of research is designed to describe the characteristics of a population or a samples, as well as to examine relationships between variables. The population of the study comprises of all senior secondary school students offering Biology in Ilorin metropolis while the target population of this study consists of 10 senior secondary school students in each selected senior secondary school in Ilorin metropolis. A research sample according to Oniye (2010) refers to a selected member of the entire population for use in a research. The use of sample which is a fair representation of the entire population that is supposed to be the only means by which a researcher could study the fewer attitude of the population.

Simple random sampling method is used to select ten senior secondary schools in Ilorin West Local Government Area in Kwara State. The names of the selected senior secondary school, shall be written on a piece of paper and will be picked randomly selected school in bucket. A total number of 10 students from each selected secondary schools in Ilorin West Local Government Area of Kwara State was selected, The questionnaire contained three sections, section A, B, and C. Section A contained demographic data of respondent, section B contains items on the level of Biology literacy among senior secondary school students in Ilorin Metropolis while section C contained items on types of common hygiene practices among senior secondary school students in Ilorin Metropolis using four liker scale.

The questionnaire employed as the instrument subjected to experts for validation in the Department of Science Education, Al-Hikmah University. Copies of the questionnaires was given to the experts in the area with a covering letter stating what the study is all about. Space was provided for the supervisor to make comments regarding the overall adequacy of the instrument.

An introductory letter collected from the Department of Science Education Al-Hikmah University Ilorin was collected before going to the selected schools. The letter was presented to the education officers/Principals of the sampled schools to seek permission to carry out the research. Selected teachers were approached and the researcher introduced himself and the consent to participate. Self-administer questionnaires were administered. All the questionnaires were delivered by the researcher personally to the respective respondents and collected later. Therefore, the researcher. Drop and pick method were used

Results and Interpretations

Research Questions One: What is the level of Biology literacy among senior secondary school students in Ilorin Metropolis?

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Table 3.
Level of Biology literacy among senior secondary school students in Ilorin Metropolis

S/N	Statement	SA	A	D	SD	MEAN
SS1	I understand the importance of vaccinations and how they help prevent diseases.	33 (33.0%)	34 (34.0%)	26 (26.0%)	7 (7.0%)	2.1385
SS2	I use what I learn in biology to make environmental friendly choices.	22 (22.0%)	56 (56.0%)	11 (11.0%)	11 (11.0%)	2.5308
SS3	I understand the basic concepts of cell biology (e.g., cell structure, function).	48 (48.0%)	31 (31.0%)	17 (17.0%)	4 (4.0%)	3.5433
SS1	I can explain the process of photosynthesis and its importance to plants and humans.	48 (48.0%)	33 (33.0%)	9 (9.0%)	10 (10.0%)	3.3222
SS2	I understand the basic principles of genetics and inheritance (e.g., how traits are passed from parents to offspring).	48 (48.0%)	22 (22.0%)	15 (15.0%)	15 (15%)	2.3232

From Table 3 above which states responses on the level of biology literacy among senior secondary school students in Ilorin Metropolis. A combined 67% of students (33.0% + 34.0%) agree or strongly agree that vaccinations are important and recognize their role in preventing diseases. On the other hand, 33% of students (26.0% disagree + 7.0% strongly disagree) do not feel they understand the importance of vaccinations or may not recognize their preventive benefits.

More so, from statement two of the same table, a combined 78% of students (22.0% strongly agree + 56.0% agree) report using their Biology knowledge to make environmentally friendly choices whereas 22% of students (11.0% disagree + 11.0% strongly disagree) do not feel they apply their Biology knowledge to make eco-friendly choices. This group may not fully understand how their biology lessons relate to environmental decisions, or they may not feel motivated or empowered to act on what they learn.

Also, a combined 79% of students (48.0% strongly agree + 31.0% agree) indicate that they understand the basic concepts of cell biology and 21% of students (17.0% disagree + 4.0% strongly disagree) do not feel they have a solid understanding of cell biology basics. This minority might struggle with these concepts or may have encountered difficulties in fully grasping the material.

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Moreover, a total of 81% of students (48.0% strongly agree + 33.0% agree) can explain photosynthesis and understand its significance to plants and humans. This suggests a strong overall grasp of photosynthesis, which is a fundamental concept in Biology while 19% of students (8.0% disagree + 10.0% strongly disagree) do not feel confident in explaining photosynthesis and its importance. This minority might have difficulties understanding the process or linking it to its broader significance for both plants and humans.

Lastly, a total of 70% of students (48.0% strongly agree + 22.0% agree) understand the basic principles of genetics and inheritance. This, therefore, shows that the majority of the students feel confident about their knowledge in this area and 30% of students (15.0% disagree + 15.0% strongly disagree) do not feel they understand genetics and inheritance principles. This relatively high percentage indicates that over one-third of the students have difficulties grasping this topic, suggesting a notable gap in knolewledg.

It can therefore be concluded that there is a substantial level of Biology literacy among senior secondary school students in Ilorin metropolis.

Research Questions Two: Examine the hygiene practices of students, their awareness of hygiene-related health issues, and their attitudes towards maintaining good hygiene.

Table 4:

Hygiene practices of students in line with health related issues, attitudes maintains of good hygiene.

S/N	Statement	SA	A	D	SD	MEAN
1.	I wash fruits and vegetables thoroughly before eating them.	55 (55.0%)	18 (18.0%)	12 (12.0%)	15 (15.0%)	3.1385
2	I trim my nails regularly to keep them clean.	32 (32.0%)	42 (42.0%)	11 (11.0%)	15 (15.0%)	3.5308
3.	I avoid eating street food from unhygienic vendors.	32 (32.0%)	33 (33.0%)	17 (17.0%)	18 (18.0%)	3.5533
4.	I cover my mouth and nose with a tissue or my elbow when coughing or sneezing.	48 (48.0%)	33 (33.0%)	11 (11.0%)	8 (8%)	2.3223
5	I regularly clean and disinfect my personal belongings (e.g., school bag, water bottle).	32 (32.0%)	42 (42.0%)	11 (11.0%)	15 (15.0%)	3.2422

From Table 4 above which states responses on the hygiene practices of students, their awareness of hygiene-related health issues, and their attitudes towards maintaining good hygiene. A total of 73.0% of students (55.0% strongly agree + 18.0% agree) report that they wash fruits and vegetables thoroughly before consuming them. This indicates a positive awareness of food safety practices among a significant majority of students and 27.0% of students (12.0% disagree + 15.0% strongly disagree) do not wash their fruits and vegetables thoroughly. This suggests that a notable minority may not prioritize or understand the importance of washing produce, which could expose them to health risks.

Also, a total of 74.0% of students (32.0% strongly agree + 42.0% agree) that they regularly trim their nails to maintain cleanliness. This suggests a strong awareness of personal hygiene practices among the majority of students, and 26.0% of students

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(11.0% disagree + 15.0% strongly disagree) do not regularly trim their nails. This significant portion may either lack awareness of the importance of nail hygiene or may not prioritize this aspect of personal care.

Moreover, a total of 65.0% of students (32.0% strongly agree + 33.0% agree) avoid eating street food from unhygienic vendors. This suggests a significant awareness of food safety and hygiene practices among most students and 35.0% of students (17.0% disagree + 18.0% strongly disagree) do not avoid street food from unhygienic vendors. This is a notable minority, indicating that a significant portion of students may either not prioritize food safety or may not recognize the risks associated with consuming street food from vendors they perceive as unhygienic.

On the same table, a total of 81.0% of students (48.0% strongly agree + 33.0% agree) practice good respiratory hygiene by covering their mouth and nose when coughing or sneezing. This reflects a strong awareness of personal hygiene practices that help prevent the spread of germs and infections and 19.0% of students (11.0% disagree + 8.0% strongly disagree) do not cover their mouth and nose when coughing or sneezing. This minority indicates that some students may not prioritize or fully understand the importance of this practice in preventing the transmission of respiratory illnesses.

Finally, a total of 74.0% of students (32.0% strongly agree + 42.0% agree) regularly clean and disinfect their personal belongings. This reflects a positive attitude towards hygiene practices among the majority of students, suggesting that they recognize the importance of maintaining cleanliness in their personal items. And 26.0% of students (11.0% disagree + 15.0% strongly disagree) do not clean and disinfect their personal belongings regularly. This represents a significant minority, indicating that some students may not prioritize this practice or may be unaware of its importance in preventing the spread of germs and maintaining overall health issues.

Therefore, it can be deduced that there are good hygiene practices among the students. The students have good awareness of hygiene-related health issues, and their attitudes towards maintaining good hygiene is positive.

Conclusion

Based on the findings of this study; Students' Perceptions of Biology Literacy and Common Hygiene Practices in Senior Secondary Schools in Ilorin Metropolis, Kwara State. it can be concluded that there is a substantial level of Biology literacy among senior secondary school students in Ilorin metropolis and also there are good hygiene practices among the students. The students have good awareness of hygiene-related health issues, and their attitudes towards maintaining good hygiene is positive.

However, there is still a relatively large number of senior secondary school students who have low level of Biology literacy either because they find it difficult to understand the subject or they lack interest on the subject. Additionally, there is a substantial number of secondary school students who have bad hygiene practices, negative attitude towards good hygiene and also lack awareness of hygiene-related health issues which could be attributed to either lack of understanding the importance of food and personal hygiene, or bad attitude towards hygiene which could expose them to health risks. This highlights the need for targeted educational interventions to improve both biology literacy and hygiene habits among students. By linking biology education more directly with practical, real-world applications, especially those

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relevant to students' health and well-being, educators can reinforce the importance of hygiene and encourage consistent, health-conscious behaviours.

The findings suggest that enhancing biology literacy within the curriculum, alongside health awareness programs, can play a crucial role in fostering healthier habits among students. Such initiatives can lead to a more informed student population that understands and values the role of science in everyday life, ultimately contributing to better public health outcomes within the school community.

Recommendation

On the basis of the findings of this study, Students' Perceptions of Biology Literacy and Common Hygiene Practices in Senior Secondary Schools in Ilorin Metropolis, Kwara State. The following recommendations were made based on the findings of the study:

1. Schools should enhance the biology curriculum by incorporating practical health applications that connect biological concepts to everyday life. This could include hands-on activities, demonstrations, and real-life case studies that help students understand the relevance of biology to personal hygiene and public health.
2. Schools should establish health and hygiene education programs that emphasize the importance of regular personal hygiene practices. Collaborating with health professionals to conduct workshops, seminars, or informational sessions on topics such as handwashing, food safety, and respiratory hygiene can reinforce the practical importance of these behaviours.
3. Active learning strategies, such as group projects, experiments, and field trips, can engage students and help them better understand biology concepts related to hygiene and health. For example, students could participate in experiments demonstrating the spread of bacteria or observe microbes under a microscope, which may enhance their appreciation of hygiene practices.

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