

The influence of socio-demographic characteristics on health information needs and accessibility among secondary school students in Morogoro region, Tanzania

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ABSTRACT

The study examined the influence of socio-demographic characteristics on health information needs and accessibility among secondary school students in Morogoro Municipal Council and Ifakara Town Council. The Comprehensive Model of Information Seeking (CMIS) anchored this research. This study adopted a descriptive and analytical research design. The study involved 271 students from 10 secondary schools selected through systematic sampling and 99 key informants chosen purposefully. Data were collected using a structured questionnaire, a key informant interview guide, and a focus group discussion guide. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 26. Descriptive statistics, such as frequencies, percentages, and means, were used, and multiple linear regression analysis was conducted. The results indicated that the most highly needed health information was the prevention of sexually transmitted diseases ($\bar{x} = 3.79$), teeth management and care ($\bar{x} = 3.40$), and puberty and body changes ($\bar{x} = 3.39$). Furthermore, the most frequently accessed health information topics were types of food for a balanced diet ($\bar{x} = 3.78$) and physical exercises ($\bar{x} = 3.43$). In addition, age, class level, and students' place of residence significantly influenced their health information needs, while age and class level also influenced access to health information. The study concludes that students have moderate access to health information. The study findings underscore the need for targeted interventions, such as the establishment of health clubs in schools and the distribution of sufficient printed materials, to bridge information gaps and ultimately improve adolescent health literacy.

Keywords: Access to Health Information, Health Information Needs, Secondary School Students, Socio-Demographic

I. INTRODUCTION

Health information refers to data and knowledge related to health, including facts about diseases, prevention, treatment, and symptoms (World Health Organization [WHO], 2023). It encompasses a wide range of topics, including nutrition, reproduction, mental health, and others. People of all ages require health information to make informed decisions, particularly when they face disparities, have specific needs, or seek knowledge to complete a task. Therefore, health information plays a crucial role in helping individuals satisfy their informational desires (Waral, 2020). Secondary school students, in particular, have distinct health information needs due to the significant physical, emotional, and social changes they undergo, which often give rise to unique health-related concerns (WHO, 2022). Their needs typically include topics such as puberty, sexual and reproductive health, mental health issues like stress, anxiety, and depression, nutrition, physical fitness, and substance use (including drugs, alcohol, and tobacco). Addressing the health information needs of secondary school students is crucial, as it enables them to make informed decisions and supports their overall well-being (Ngissa *et al.*, 2024).

Secondary school students face various health-related issues that affect their physical, emotional, and mental well-being (WHO, 2023). Mental health challenges, substance use, and unhealthy habits like poor diet and limited physical activity are growing concerns among adolescents (National Institute on Drug Abuse [NIDA], 2022; Centers for Disease Control and Prevention [CDC], 2023). They are also vulnerable to sexual and reproductive health problems, including exposure to STIs and unintended pregnancies (WHO, 2022). One way to reduce these challenges is by enhancing students' access to health information. Secondary school students in developed countries generally have better access to health information due to the widespread availability of the internet, the strong integration of health education into school curricula, and high digital literacy (Organization for Economic Co-operation and Development [OECD], 2021). In contrast, many secondary school students in developing countries face limited access to accurate and age-appropriate health information (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021).

In Tanzania, despite various efforts to fulfil the information needs of adolescent students, studies show a high incidence of health risk behaviours such as early pregnancy, sexually transmitted diseases, substance use, and others (Gift & Mweya, 2024; Mavura *et al.*, 2022; Ngissa *et al.*, 2024). The report by Human Rights Watch highlighted that many girls and young women in Tanzania have minimal access to quality sexual and reproductive health education in schools (Human Rights Watch [HRW], 2017). Moreover, often leads to unintended pregnancies, school dropouts, and a general lack of awareness about reproductive rights and health services. In addition, a study by Msovela *et al.* (2025) revealed that many adolescent girls had limited knowledge about puberty and menstruation. This can be improved by enhancing girls' access to the information they need.

Access to needs-based health information is a crucial factor influencing the health behaviours of secondary school students worldwide (WHO, 2022). When students effectively acquire and utilise health information, they become more aware and empowered to make informed decisions that enhance their overall well-being. However, access to and engagement with this information are shaped by various socio-cultural, economic, and institutional factors, such as norms, financial barriers, the quality of education, and the availability of youth-friendly health services (Anasi & Adediji, 2016; Oyedokun-Adebagbo *et al.*, 2023). These barriers underscore the importance of implementing comprehensive approaches to improve health information accessibility for students.

Research consistently highlights the influence of socio-demographic characteristics on students' ability to access and utilise information. Variables such as age, academic level, sex, digital literacy, and parental support significantly shape how students seek and engage with information (Adeniyi *et al.*, 2022; Folorunso & Olaniyi, 2020; Kavitha & Chandrashekara, 2022; Wilder, 2023). For instance, students with higher digital competence or supportive family environments are generally better equipped to find and use information effectively. In light of this, the present study aims to examine the specific health information needs of secondary school students in Tanzania and how socio-demographic factors influence these needs.

1.1 Statement of the Problem

Secondary school students need access to reliable health information to support healthy behaviors and informed choices (Ngissa *et al.*, 2024). However, research in Tanzania indicates they face significant barriers in obtaining such information (HRW, 2017). Socio-demographic factors, such as age, sex, and education level, often limit access to health resources (MoEST & Ministry of Health, 2021; Mbatia, 2024; Rahayu *et al.*, 2024). This lack of access has contributed to rising unhealthy behaviours such as substance abuse, early sexual activity, and increased cases of STIs and unintended pregnancies (WHO, 2022; Mavura *et al.*, 2022).

Several studies worldwide have examined the information needs and accessibility among secondary school students, including work by Otoide (2015), Hamilton-Ekeke *et al.* (2020), and Lee *et al.* (2021). These studies have explored areas such as students' information literacy, access skills, and sources of information on sexual and reproductive health. In Tanzania, similar research has been conducted to assess knowledge levels and access to health information among secondary school youth. For example, studies have addressed topics like sexually transmitted infections, sexual behaviours, family planning, and menstruation (Ayubu & Kabeya, 2019; Msovela *et al.*, 2024). Collectively, this body of research highlights the ongoing challenges and varying levels of access to essential health information among adolescents. None of the existing studies has examined how socio-demographic factors influence health information needs and accessibility among secondary school students. This study addresses that gap by exploring these factors, aiming to inform targeted interventions and improve adolescent health literacy, ultimately reducing health-risk behaviours and supporting more effective health education programs.

1.2 Research Objectives

- i. To assess the accessibility of health information to secondary school students.
- ii. To determine the influence of socio-demographic characteristics on health information needs among secondary school students.
- iii. To establish health information needs among secondary school students.
- iv. To examine the influence of socio-demographic characteristics on health information accessibility among secondary school students.

II. LITERATURE REVIEW

2.1 Theoretical Review

Since this study aims to assess how socio-demographic factors influence students' health information needs and accessibility, the Comprehensive Model of Information Seeking (CMIS) was found to be both relevant and applicable. The model has been widely applied in both educational and health communication contexts, making it a strong theoretical foundation for analyzing information access among adolescents. Several studies have successfully

employed CMIS to explore how individuals interact with health information, particularly about socio-demographic variables (Yang *et al.*, 2023; Xu *et al.*, 2025; Jiang *et al.*, 2022; Fetherston, 2019; Kassim & Katunzi-Mollel, 2020; Ferraris *et al.*, 2023). These studies provide empirical support for the model's effectiveness in understanding the relationship between personal background and information behavior, which is central to the focus of this research.

Since the study aims to assess how socio-demographic factors influence students' health information needs and accessibility. The Comprehensive Model of Information Seeking is found to be relevant and applicable. This model has been used in both educational and health contexts (Yang, Q., *et al.*, 2023; Xu, *et al.*, 2024; Jiang, *et al.*, 2022; Fetherston, 2019; Kassim, & Katunzi-Mollel, 2020; Ferraris *et al.*, 2023).

The Comprehensive Model of Information Seeking (CMIS) is a theoretical framework designed to predict how individuals seek information, particularly in response to health-related concerns. The model comprises three primary components: Antecedents, Information Carrier Characteristics, and Information Seeking Actions (Basnyat *et al.*, 2018). Antecedents include factors such as demographics, personal experiences, the salience of the health issue, and individual beliefs. These elements influence an individual's predisposition to seek information. Information Carrier Characteristics pertain to the attributes of the information sources, including their credibility, accessibility, and perceived usefulness. Finally, Information Seeking Actions describe the behaviors individuals engage in to acquire information, characterized by the scope, depth, and method of the search (Yang *et al.*, 2023).

CMIS is particularly suitable for this research because it emphasizes the role of antecedent factors such as demographics, personal experiences, beliefs, and the perceived relevance of the health issue in shaping an individual's motivation to seek information. These components align closely with the objectives of this study, which seeks to understand how characteristics such as age, sex, income level, and educational background affect students' information-seeking behavior. In the context of secondary students, the CMIS will be applied to understand how students' and parents' characteristics influence their health information-seeking behaviors.

2.2 Empirical Review

2.2.1 Health Information Needs among Secondary School Students

Various studies from different parts of the world have been conducted to assess the health information needs of adolescent students in secondary schools, highlighting a consistent demand for accurate and accessible information across diverse health topics. For instance, Holtman *et al.* (2024) revealed that female students most commonly seek health information related to menstruation, contraception, sexually transmitted infections (STIs), and pregnancy. These areas are often underrepresented in formal education, leading many students to rely on informal or unreliable sources, which may increase the risk of misinformation and poor health outcomes.

In a related study, Martinović *et al.* (2021) found that adolescent girls also express a strong need for information on general health topics such as nutrition, disease prevention, mental health issues like depression, romantic and peer relationships, sexual behaviour, and substance use, particularly alcohol. This suggests that their health concerns extend beyond reproductive health and encompass a wide range of physical, emotional, and social well-being.

Furthermore, Shrestha *et al.* (2024) explored the perceived need for sexual and reproductive health services among higher secondary school students. They found that while many adolescents recognized the importance of such services, actual utilization was low due to barriers like stigma, limited youth-friendly facilities, and lack of privacy. These findings underscore the importance of providing comprehensive, age-appropriate, and culturally sensitive health education and services that address the diverse needs of adolescent girls and empower them to make informed decisions about their health.

Although numerous studies have explored the information needs of students in secondary schools, many of these investigations have primarily focused on identifying the types of information sought by students. However, they often overlook a critical dimension: the underlying characteristics of the students that may influence their perceived need for such information. Factors such as age, class, and parental occupation can significantly shape what students believe they need to know, but fail to address the root causes that drive information needs among adolescent students.

2.2.2 Accessibility to Health Information among Secondary Students

Several studies have been conducted to evaluate the accessibility of health information among secondary school students, particularly in the area of sexual and reproductive health. Understanding how adolescent students access and engage with such information is crucial, as it directly influences their health literacy, decision-making, and overall well-being. For instance, the study by Gondim *et al.* (2015) observed that the adolescents involved had relatively good access to educational activities focused on sexual and reproductive health. Notably, schools were identified as the primary and most reliable source of this information. This finding underscores the important role that formal education systems play in disseminating health-related knowledge to young people, especially in structured environments where accurate information can be delivered consistently.

Ito et al. (2022) found that access to health information among adolescent students was generally limited. Their study revealed that while there was some awareness, significant gaps remained, particularly due to insufficient communication channels and cultural taboos surrounding reproductive health topics. The influence of family, especially parents, was also noted as a key factor influencing accessibility. The study emphasized the need for greater involvement of both parents and educators in the health education process.

Similarly, Tonsing (2022) examined the accessibility of COVID-19 information among students with communication needs. Their findings indicated that few students were well-informed about COVID-19, such as its nature, modes of transmission, and prevention strategies. There was a significant lack of access among students with communication needs. These points highlight the need for more comprehensive health education programs that cater to a diverse range of users.

Additionally, Msovela *et al.* (2025) conducted a study focusing on adolescents' knowledge of puberty and menstruation. Their research highlighted that many young girls still possess a limited understanding of these fundamental biological processes. Despite some efforts to educate students through school-based programs, the study emphasized that misinformation, stigma, and lack of parental guidance continue to hinder effective learning in this area.

Although various studies have assessed the accessibility of health information among students in secondary schools, they have not examined the characteristics of the students. These characteristics could significantly influence their access to such information.

2.2.3 Socio-Demographic Factors Influencing Health Information Needs among Secondary School Students

The review of related literature reveals that various studies have examined socio-demographic factors influencing health information needs among secondary school students in different parts of the world. Age significantly influences health information priorities and needs among students. Research indicates that younger adolescents gravitate toward general health topics, while older youths tend to focus more on personal health matters (Pendl *et al.*, 2024; Anne-Laure *et al.*, 2024). As adolescents grow older, their interest in sexuality issues increases, often inversely related to their engagement with broader topics such as pandemics and environmental health during early adolescence (Anne-Laure *et al.*, 2024; Martinović *et al.*, 2021; Spinelli & Martinovich, 2024). This shift underscores the necessity for age-appropriate health information that aligns with the evolving interests of adolescents.

Sex also plays a critical role in shaping health information needs. Females tend to show a heightened interest in mental health and relational topics, while males focus more on physical health issues. Research highlights that girls are particularly interested in discussions surrounding sleep, mental health, violence, and social life (Nash *et al.*, 2019). These sex disparities indicate that health education programs must consider specific interests and concerns relevant to each sex to be effective.

2.2.4 Socio-Demographic Factors Influencing Health Information Accessibility among Secondary School Students

The review of related literature shows that various studies have examined socio-demographic factors influencing health information accessibility among secondary school students in different parts of the world. Higher grades or classes have been valued as a means for increasing knowledge about health topics and enhancing critical awareness of health issues. Individuals with higher education levels tend to have better access to and utilization of health information, as their educational attainment is associated with improved literacy and a greater ability to navigate complex information sources (Mishra & Mukhopadhyay, 2021). Consequently, secondary school students at higher levels often exhibit superior reading and writing proficiency compared to their lower-level peers, enabling them to process intricate health information from diverse formats. Therefore, numerous studies have demonstrated a relationship between information accessibility and users' educational levels (Oyedokun-Adebagbo *et al.*, 2023).

Age positively influences the accessibility of health information. The older students have greater access to health information. Older students tend to be more mature and are more likely to be aware of and utilize various sources of information, thereby increasing their chances of accessing health-related content. Fastrich *et al.* (2024) found that an increase in student age is associated with a higher ability to search for and retrieve information.

Second, Jatu *et al.*, (2024) revealed that students in higher grades demonstrated better information access and evaluation skills compared to those in lower grades. In addition, Lugard (2023) found that students in higher grades exhibited greater ICT awareness and usage than their counterparts in lower grades. This trend was attributed to increased exposure to ICT resources and more opportunities to integrate technology into their learning processes. Greater access to ICT resources may, in turn, enhance access to various types of information, including health-related information.

A study by Chekol *et al.* (2023) revealed that boys scored higher in most domains of information search than girls. Males have higher levels of access because male students are active in discussing or seeking information about

health, particularly topics related to sexual and reproductive health. Parental education and economic status are also notable predictors of health information access. Students from higher socioeconomic backgrounds typically have more access to health literacy resources, thereby enhancing their ability to make informed health decisions (Duplaga & Grysztar, 2021). The home environment, including available resources, has a significant impact on students' health literacy, underscoring the need for community-based initiatives that address educational inequalities. This was reported in a study by Pendl *et al.* (2023).

Geographic disparities are pronounced, with students in rural areas of Ghana facing significant barriers in accessing online health resources due to a lack of awareness (Sambah *et al.*, 2023). Despite the fact that various socio-demographic factors, such as age, socioeconomic status, cultural background, and educational level, have been acknowledged in the literature as playing a significant role in influencing students' information needs and accessibility, there remains a notable gap in empirical research. Specifically, there is a lack of studies that explore how these socio-demographic characteristics of both students and parents influence the perceived health information needs and accessibility of secondary school students. This gap in research is particularly relevant in the context of Tanzania, where socio-demographic factors of students and parents can affect how health information is accessed. Understanding these influences is crucial to designing more effective, targeted health education interventions that address the unique needs of secondary school students

2.3 Conceptual Framework

The conceptual framework is based on a single theory: the Comprehensive Model of Information Seeking (CMIS). The framework includes both independent and dependent variables. The independent variables are the socio-demographic characteristics of the students. However, they also include residency and parental education, as they influence both access to and the perceived information needs of the students. The dependent variables are the student's health information needs and their access to health information. These factors can influence how students perceive and access health information. For instance, younger students may have different health information needs compared to older students, and those from higher socioeconomic backgrounds may have better access to resources. Students with more educated parents might be more skilled at locating and understanding health information, whereas those in rural areas may face challenges due to limited access.

Moreover, the study assumes that students perceived health information needs vary significantly based on these demographic and socioeconomic factors. Older students and those in higher classes often have greater access to health information and may take more personal responsibility for their health. Females may have higher health information needs than males, especially in areas like menstrual health, nutrition, and emotional well-being, influenced by both social and biological factors. Additionally, students whose parents work in education or health-related fields are more likely to have their health information needs effectively met, due to greater access to accurate guidance. In contrast, students from families with low literacy levels may have greater unmet health information needs, often due to a lack of awareness or limited access to trustworthy sources.

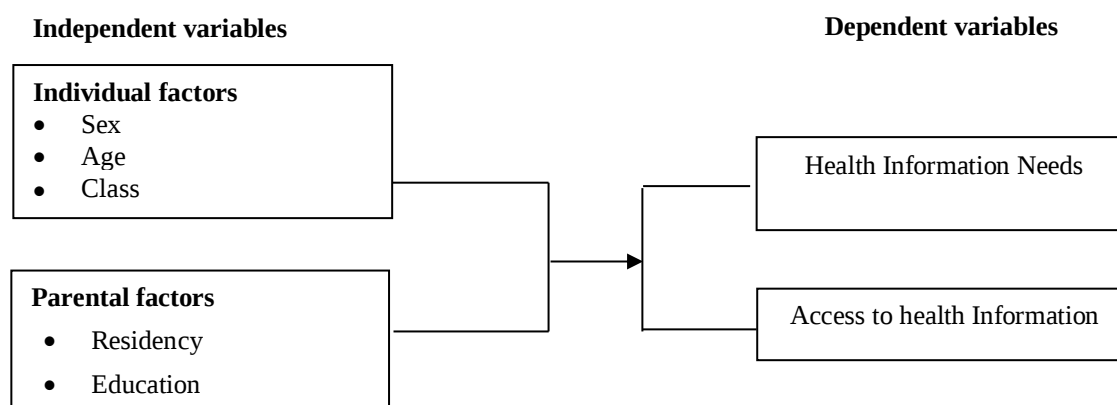


Figure 1
Conceptual Framework

III. METHODOLOGY

3.1 Study Area

The study was carried out in the Morogoro Region, which was selected due to the low access to health information among secondary school students (León-Himmelstine *et al.*, 2021; Kavana, 2021; Msollo & Majaliwa,

2025). Furthermore, two districts, namely Morogoro Municipality and Ifakara Town Council, were selected. Morogoro Urban features a more economically diverse population, including students from both high- and low-income families. The Ifakara Town Council District includes many students from lower socioeconomic backgrounds, often in remote areas, including both districts will ensure representation of students with both features.

3.2 Research Design

This study adopted a descriptive and analytical research design. A descriptive design was used because it allows for a clear understanding of the current situation, such as the percentage of students accessing health information and the extent of their information needs. In addition, an analytical design was employed to explore the relationships between variables. This approach was chosen because the study aims to answer the 'why' and 'how' specifically, how socio-demographic factors influence access to health information and perceived information needs.

3.3 Study Population, Sampling, and Sample Size

The study population refers to the targeted group from which the sample is drawn (Upadhyay, 2023). This study targeted secondary school students from selected schools within the study area. Both probability and non-probability sampling techniques were employed, specifically purposive sampling, simple random sampling, and systematic random sampling. A total of 271 secondary school students were selected through simple random sampling from a pool of 4 752 students across 10 schools, ensuring proportional representation from each selected school. Systematic sampling was also applied to maintain proportionality based on the size of each school.

3.4 Data Collection Methods

The study used both quantitative and qualitative methods in collecting data. Mixed methods procedures employ aspects of both quantitative methods and qualitative procedures (Stadtlander, 2009). Quantitative data were collected using a structured questionnaire designed to assess student's health information needs and accessibility. The questionnaire included closed-ended questions. Interviews with open-ended questions were used to capture qualitative insights from 99 teachers, and focus group discussions were used to collect data from 6 participants at each school. Prior to data collection, the instrument was pre-tested on 30 respondents. The results of Spearman-Brown split-half Cronbach's alpha were 0.83, which is higher than the minimum recommended reliability score of 0.7 as per Hair *et al.* (2010).

3.5 Data Collection Instruments

This study employed structured questionnaires, a focus group discussion guide, and interviews with key informants. The structured questionnaire was used to enable the collection of data from a large sample of respondents. It was supplemented by focus group discussions, which allowed for deeper explanations and insights from participants. Additionally, interviews with teachers were conducted to triangulate the data and enhance the credibility of the findings.

3.6 Data Analysis

Qualitative data was analyzed using thematic analysis. Quantitative data was coded and analyzed through the Statistical Package for Social Science (SPSS) version 26. To analyze information needs and accessibility of secondary school students: Descriptive statistics, which include the mean ($\bar{x}$), were used to analyze the information needs and accessibility. Furthermore, One-way Analysis of variance was used to determine significant differences in the mean of health information needs, followed by Duncan Multiple Range Test (DMRT) for mean separation. To analyze the influence of social demographic characteristics on secondary school students information needs: The multiple linear regression equation used for analysis was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_5 X_5.$$

Where; Degree of needed information (summated score of the respondent's information needs scores). The summated was obtained by summing up the individual responses for all the 16 items contained on the list.

β = Regression Coefficients. β_0 = Intercept.

$X_1 \dots X_4$ are explanatory variables (Sex (0=Female, 1=Male), Age (Years), form (1, 2, and 3), Residence (0=within, 1=Outside), Education of head of household (1=Primary, 2=Secondary, 3=Certificates, 4=Diploma, 5=Bachelor),

To analyze the influence of social demographic characteristics on secondary student health information accessibility: The multiple linear regression equation used for analysis was as follows: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_4 X_4$.

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In addition, prior to using linear regression, the multicollinearity assumption was checked using the variance inflation factor (VIF), and autocorrelation was computed. Meanwhile, the qualitative data were analyzed using thematic analysis, a method that involves identifying, analyzing, and reporting themes within the data.

Table 1

Socio-Demographic Characteristics on Health Information Needs and Accessibility

Variables	Variable description	Expected outcome
Dependent variables	Health Information Needs Health Information Access	+/-
Independent variables	Social demographic characteristics 1. Age 2. Gender 3. Form 4. Residence 5. Head of households 6. Education level of Head of households 7 Occupation of head of household	+/-

IV. FINDINGS & DISCUSSION

4.1 Socio Demographic Characteristics of the Respondents

The socio-demographic characteristics of the respondents reveal critical insights regarding the sample population of secondary school students in the study area. The results were presented in Table 2.

Table 2

Socio-Demographic Characteristics (n=271)

	Categories	N	%
Sex	Male	108	39.8
	Female	163	60.2
Age	13 - 15	66	24.4
	16 - 18	195	72.0
	19 - 23	10	3.7
Form	Two	103	38.0
	Three	79	29.2
	Four	89	32.8
Residence	Inside the local area	170	62.7
	Outside the local area	101	37.3
Head of household	Father	211	77.9
	Mother	51	18.8
	Guardian	9	3.3
Education level of the head of household			
	Primary	32	11.8
	Secondary	52	19.2
	Certificate	32	11.8
	Diploma	42	15.5
Occupation of head of household	Bachelor	113	41.7
	Casual laborer	9	3.3
	Farmers	45	16.6
	Business	93	34.3
	Employed	124	45.8

The results showed that about 60.2% were girls while only 39.8% were boys. Moreover, the age distribution shows that of all the students, 72% are between 16 and 18 years old, while those aged between 13 and 15 years were 24.4% (Table 1).

Besides, the educational levels of the parents surveyed ranged from primary education to bachelor's degrees. The results indicated that 41.7% of students had their head of household attain secondary education, 15.5% of the parents held a diploma, while only 11.8% had completed only primary education. Furthermore, the study also assessed the residence of the students. The results revealed that more than half (62.7%) were residing within the local area, while only 37.3% were residing outside the local area.

In addition, the results showed that less than half (45.8%) of the students had parents who were employed, while 34.3% engaged in business, and only 3.3% participated in casual labor activities to earn income. The study included students from Form Two, Three, and Four. The results showed that 38.0%, 29.2%, and 32.8% of students were from Form Two, Three, and Four, respectively. The results indicate that there is a relatively similar proportional distribution of students across each class.

4.1.1 Health Information Needs of Secondary Schools' Students

The results in Table 2 show the mean scores for the types of health information needed by the respondents. The highest mean score was for information on the prevention of sexually transmitted diseases ($\bar{x} = 3.79$). This was followed by information related to teeth management and care ($\bar{x} = 3.43$), and puberty and body changes ($\bar{x} = 3.39$). Other important health information included early pregnancy prevention and the prevention of communicable diseases, both with a mean score of 3.38. Additionally, respondents indicated a need for information on types of food for a balanced diet ($\bar{x} = 3.10$) and types of physical exercises for obesity prevention ($\bar{x} = 3.12$).

During the FGD, one student pointed out that:

There are changes we observe in our bodies; for instance, some experience stomachaches while others don't. We are uncertain about these changes, and even if you ask a colleague, they might say, 'I don't understand it well either.'

Similarly, FGDs revealed that:

Students wanted information on sexually transmitted diseases to protect themselves. Those in biology classes accessed this through lessons, while others had limited access due to a lack of coverage in their subjects.

Table 3

Type of Health Information Needed among Secondary Schools' Students

Type of information needed	$\bar{x}$
Types of food for a balanced diet	3.10c
Types of physical exercises for obesity prevention	3.12c
Stress management techniques	3.27bc
Prevention of Sexually transmitted diseases	3.79a
Early pregnancy prevention	3.38bc
Information on the prevention of communicable diseases	3.38bc
Substance abuse prevention and support	3.28bc
Sleep hygiene and resting	3.31bc
Understanding common illnesses and symptoms, and treatment	3.34bc
Immunization requirements and resources	3.35bc
Access to confidential health services	3.32bc
Drug abuse prevention and support	3.33bc
Transmission of sexually transmitted diseases	3.37bc
Personal hygiene	3.36bc
Teeth management and caring	3.43b
Puberty and body changes	3.39bc

Mean with same superscript are not significant different at $p > 0.05$, $F_{15, 5316} 0.05 = 2.93$, $p = 0.00$

4.1.2 Socio-Demographic Influencing Health Information Needs among Secondary Schools' Students

Table 4 shows the influence of selected demographic characteristics on the student's information needs. The model included the sex, age, grade, residence, and education level of the head of household. The variation inflation factor (VIF) ranged from 1.068 to 1.446, which is lower than the minimum recommended VIF as recommended by Pallant *et al.* (2014). The results ranged from implying that the results do not have the problem of multicollinearity. In addition, Durbin Watson results were 1.63, which falls within the recommended range of 1.5 and 2.5, implying that

the results do not have autocorrelation (Kutner *et al.*, 2022). Moreover, the coefficient of variation was 0.225, implying that the selected demographic characteristics of the respondent explained 22.5% of the information needs.

Table 4

Regression Results on Socio-Demographic Factors Influencing Health Information Needs

Factor	Unstandardized coefficients		Standardized coefficients	t	P value	Collinearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	125.538	12.629		9.941	.000		
Sex	3.563	2.066	.098	1.724	.086	.903	1.107
Age	-4.210	.824	-.332	-5.106	.000	.691	1.446
Grade	-4.021	1.302	-.196	-3.087	.002	.726	1.377
Residency	4.892	1.999	.137	2.447	.015	.931	1.075
Education of the head of household	-.543	.654	-.046	-.830	.407	.936	1.068

$R^2=0.225$, $p=0.00$; Durbin-Watson=1.63

The beta coefficient for age was 4.21, and the variable is statistically significant ($p<0.05$). This means that a unit increase in age lowers the perceived information needs by 1 score. Furthermore, the class of the student influenced the information needs. The results show that the variable has a beta coefficient of 4.02, and it was statistically significant ($P<0.05$). This means that a unit increase in grade of the students reduces the information needs score by 4.02. The student's residence influenced the information needs. The variable has a beta coefficient of 4.892. Means that, respondents residing outside the locality have 4.89 higher information needs score than these residing within the locality.

The sex variable had a positive beta coefficient, implying that boys had higher health information needs than girls. However, this relationship was not statistically significant ($p > 0.05$). Similarly, the education level of the parents had a negative beta coefficient ($\beta = -0.543$), indicating that an increase in parental education was associated with a decrease in students' health information needs. Nevertheless, this variable was also not statistically significant ($p > 0.05$).

4.1.3 Health Information Accessibility among Secondary Schools' Students

Table 5 presents the mean scores for health information accessibility on various topics.

Table 5

Health Information Accessibility

Type of Information accessibility	$\bar{x}$
Types of food for a balanced diet	3.78a
Types of physical exercises for obesity prevention	3.43b
Stress management techniques	3.38b
Prevention of Sexually transmitted diseases	3.13c
Early pregnancy prevention	3.31bc
Information on the prevention of communicable diseases	3.27bc
Substance abuse prevention and support	3.37bc
Sleep hygiene and resting	3.38bc
Understanding common illnesses and symptoms, and treatment	3.37bc
Immunization requirements and resources	3.35bc
Access to confidential health services	3.37bc
Drug abuse prevention and support	3.32bc
Transmission of sexually transmitted diseases	3.31bc
Personal hygiene	3.34bc
Teeth management and caring	3.24c
Puberty and body changes	3.27bc

Means with the same superscript are significantly different at $p<0.05$.

$F_{15, 4316} 0.05=2.5043$, $p=0.001$.

As shown in Table 5, the mean score for access to information about types of food for a balanced diet was 3.78. For physical exercises in the prevention of obesity, the mean score was 3.43. Access to health information on stress management techniques had a mean score of 3.38, while substance abuse prevention and support scored 3.37. The mean score for access to information on the prevention of sexually transmitted diseases (STDs) was 3.13, and for puberty changes, it was 3.27.

During the FGD, one student pointed out that

"There is a sports session once a week, during which the sports teacher teaches us various exercises, such as how to build muscles and reduce weight."

This was confirmed by FGDs, where students indicated "they were taught topics related to nutrition and balanced diets in biology classes by their teachers."

4.1.4 Socio-Demographic Influencing Health Information Accessibility among Secondary Schools' Students

The results showed that the Variance Inflation Factor (VIF) ranged from 1.11 to 1.45, which is below the threshold of 10, indicating that there was no multicollinearity problem, as recommended by Hair *et al.* (2010). In addition, the Durbin-Watson value was 1.71, which falls within the acceptable range of 1.5 to 2.5, implying that there was no autocorrelation problem in the data (Kutner *et al.*, 2022). The coefficient of determination (R^2) was 0.195, implying that the selected independent variables included in the model explained 19.5% of the variation in accessibility to health information among secondary school students.

Table 6

Regression Results on Socio-Demographic

Factor	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	24.280	8.450		2.873	.004		
Sex	-1.219	1.383	-.056	-.882	.379	.903	1.107
Age	.133	.552	.018	6.240	.000	.691	1.446
Class level	1.284	.871	.105	4.474	.001	.726	1.377
Residency	-1.444	1.338	-.068	-1.080	.281	.931	1.075
Education of the head of household	.061	.437	.009	.139	.889	.936	1.068

$R^2=0.195$, $p=0.00$; Durbin-Watson=1.71

Age had a positive beta coefficient of 0.13, and the variable was statistically significant ($p < 0.05$). This means that for every one-unit increase in age, the health information accessibility score increased by 0.133. Likewise, the class level of the students significantly influenced their access to information, with a beta coefficient of 1.28, and the variable was statistically significant ($p < 0.05$). This implies that students in higher classes had greater access to health information.

Similarly, the sex has a negative beta coefficient of -1.22. This implies that female students had higher levels of access to health information compared to their male counterparts. However, the variable was not statistically significant ($p > 0.05$), suggesting that the difference in access between male and female students may be due to chance.

In addition, the education level of the head of household has a positive beta coefficient of 0.06, indicating a positive relationship between parental education and students' access to health information. However, the variable was not statistically significant ($p > 0.05$). The results of the regression analysis revealed that the student's place of residence had a negative beta coefficient of -1.44. This implies that students residing outside the study area or school locality had lower access to health information by approximately 1.44 units compared to those residing within the area. However, this relationship was not statistically significant ($p > 0.05$), indicating that place of residence may not be a predictor of access to health information among secondary school students.

4.2 Discussion

4.2.1 Socio Demographic Characteristics of the Respondents

The distribution indicates a more than half (60.2%) were girls. The implication here is that in the study area, there were more girl's students than male students. This significant predominance of female students reflects broader educational trends, where girls have increasingly higher enrollment rates than boys (World Bank, 2022). Several factors contribute to this occurrence. Firstly, various national and local initiatives promoting gender-equal opportunity in education have played a pivotal role. Conversely, the dropout rate for boys by 55.2%, which is notably

higher than that of girls in Tanzania (The Chanzo, 2023). Causative factors to this trend may include socioeconomic pressures that compel boys to enter the labour force early to support their families and cultural perceptions that prioritize boys' participation in paid labour over their continued education. The Regional Statistics for Morogoro verify that more than half of the secondary school students are girls, emphasizing the continuing changes in school demographics (URT, 2023). These results are similar to the Regional Statistics in Morogoro, which indicated that more than half of the secondary school students were girls (URT, 2023).

Additionally, the age distribution shows that the majority of the students (72%) are between 16 and 18 years old (Table 1). This implies that most of the respondents were in their adolescent years. This age distribution aligns with Tanzania's education policy, which allows children to start grade one at the age of six. As a result, they typically complete class seven between the ages of 13 and 14, and then proceed to secondary school. Adolescents are generally more active and therefore require access to health information to make informed decisions. This finding is similar to a previous study by Pezzullo (2022), which revealed that most secondary school students are between 13 and 17 years old.

Furthermore, the results indicated that more than two-thirds (41.7%) of students indicated that their head of household had attained secondary education, while only 11.8% had completed only primary education. These findings suggest that a majority of the parents possess a relatively high level of education. As such, they may be more likely to be informed and capable of guiding their children, particularly in accessing reliable health information. Educated parents are generally more aware of the importance of health literacy and can play a key role in supporting their children in making informed decisions regarding their well-being. Parental involvement and support can have a positive influence on adolescents' ability to seek, understand, and apply health-related knowledge. Notably, these results differ from the findings of Ndijuye and Dadi (2024), who reported that most household heads in their study had only primary or secondary education. This contrast may be due to differences in the demographic or geographical characteristics of the study populations.

Likewise, the findings showed that more than half (62.7%) were residing within the local area. The dominance of students residing within the local area is due to the establishment of ward-based secondary schools, which accommodate students who passed from primary schools within the same area. However, there were also nearby villages and boarding schools that hosted students coming from further locations. This finding is similar to a previous study by Rashidi (2015), which indicated that the introduction of ward-based secondary schools improved transition rates from primary to secondary education, reducing the need for students to travel long distances to access secondary education.

Moreover, less than half (45.8%) of the students indicated that their parents were employed. These results imply that most of the respondents come from families with reliable sources of income. The income status of parents influences their ability to provide support to students in various areas, including access to different sources of information. Therefore, financially stable parents are more likely to support their children in accessing information, including health-related information, thus fulfilling their information needs. This finding is similar to the study by Boateng *et al.* (2021), which revealed that the major sources of income for parents were formal employment, small businesses, and agriculture.

With regard to class, the results showed that 38.0%, 29.2%, and 32.8% of students were from form two, three, and four, respectively. The results imply that there is a relatively similar proportional distribution of students across each class. Since the sampling was proportional, this implies that the number of students in each class does not have significant differences. Likewise, with regard to the household head, the results showed that most students (77.9%) live in families headed by the father, while few (3.3%) live with a guardian. This result is likely influenced by African traditions, which recognize the father as the head of the household. In families with both mother and father, shared responsibilities enhance child care, which increases the likelihood of students accessing information from their parents.

4.2.2 Health Information Needs of Secondary Schools Students

The highest mean score was for information on the prevention of sexually transmitted diseases ($\bar{x} = 3.79$). This implies that the most highly needed health information among students was related to the prevention of sexually transmitted infections (STIs). This may be because most secondary school students are at adolescence, a stage characterized by significant physical and emotional changes. These changes can lead to increased curiosity and, in some cases, engagement in sexual activity. Therefore, students need to receive accurate and age-appropriate information on how to protect themselves from sexually transmitted infections, which pose serious health risks to sexually active individuals. The findings imply that there is a critical need to develop and implement awareness campaigns and health education programs that specifically address sexual health among secondary school students. This is consistent with the findings of Shrestha *et al.* (2024) and Saraipour *et al.* (2025), who also reported that

information on the prevention of sexually transmitted diseases was among the most needed health topics for secondary school students.

The second most needed health information among secondary school students was related to teeth management and care ($\bar{x}=3.43$). This indicates that students are seeking information on how to properly take care of their teeth. This finding may be attributed to the fact that many adolescents frequently consume sugary foods such as sweets and snacks, which contribute to dental problems. As a result, a significant number of students suffer from tooth decay or broken teeth that are often left untreated or unreplaced. These findings are supported by studies conducted by Essén *et al.* (2019) and John Bayingana *et al.* (2024), which reported that the third most needed health information among secondary school students was related to puberty and body changes ($\bar{x}=3.39$). This topic was highly needed due to the fact that most secondary school students are in the adolescent stage with significant physical and emotional changes as they transition from childhood. At this age, students are curious and eager to learn about the changes they are experiencing. Therefore, they require accurate information to help them understand these changes and make informed decisions. Additionally, in many communities, myths and misconceptions about puberty are common, which can lead to confusion or misinformation among adolescents.

This implies that there is a lack of accurate and accessible puberty health information among adolescents. These findings are consistent with the study by Martinović *et al.* (2021), which revealed that information about puberty was among the most highly needed health topics for secondary school students.

The fourth most needed health information topics were early pregnancy prevention and the prevention of communicable diseases, both with a mean score of 3.38. Students expressed a need for information on early pregnancy prevention for both boys and girls because they are at an age where physical and emotional changes may influence them to engage in sexual activity. One of the major consequences of this behavior is unwanted pregnancy, which can lead to school dropout and social stigma for the affected students and their families. Therefore, students need accurate information on how to prevent early pregnancy to protect their health, continue their education, and avoid social consequences. Additionally, students indicated a need for information on the prevention of communicable diseases. This is likely due to the increasing prevalence of such diseases, which can be easily transmitted from infected to uninfected individuals. Understanding how to prevent these diseases is essential for maintaining personal and public health. These findings are consistent with studies conducted by Holtman *et al.* (2024) and Abdissa (2021), which also reported that secondary school students highly needed information on early pregnancy and communicable disease prevention.

Moreover, the least needed health information topics were the types of food for a balanced diet and types of physical exercises for obesity prevention, with mean scores of 3.10 and 3.12, respectively. This implies that students did not consider these types of health information a priority. This could be due to the availability of such information within their locality or school environment. It also implies that existing school-based nutrition and physical education programs are effectively reaching students, at least in terms of perceived exposure and awareness. Additionally, programs that promote various physical activities may be contributing to students' confidence and engagement in physical exercise.

4.2.3 Socio-Demographic Characteristics Influencing Health Information Needs Secondary Schools' Students

First, age was a factor that influenced health information needs. The older students have lower health information needs compared to the younger ones. A possible explanation for this could be that as age increases, students gain greater awareness of various sources of information, which helps them meet their health information needs more effectively. These findings are consistent with the study by Hamilton-Ekeke *et al.* (2020), which found that age significantly influences students' health information needs, with older students demonstrating lower needs than their younger counterparts.

Second, the class level of the student was negatively influenced by the information needs. The implication is that students in lower classes have higher information needs than those in higher classes. As students progress through higher levels, they are more likely to have been exposed to health education topics multiple times through formal curriculum, peer discussions, or media, leading them to feel that they already know the information. Moreover, students at higher levels may have better research skills, enabling them to access and utilize information from various sources, thus reducing their perceived health information needs. This is similar to the study by Maphoto (2016), which revealed that there was a lower extent of information needs as students progressed to higher classes.

Third, the student's residence influenced the information needs. The respondents residing outside the locality have higher information needs than those residing within the locality. Holst *et al.* (2023) elaborated that students residing in urban areas or those located far from central or well-connected regions exhibit differences in their access to health information. This variation is often attributed to disparities in infrastructure, availability of media, and exposure to school or community-based health programs. Students in remote or underserved areas may have fewer opportunities

to receive accurate and timely health information, which can limit their awareness and ability to make informed health decisions. In support of this, Hailemariam *et al.* (2021) emphasized the importance of developing targeted health communication strategies that address geographic discrepancies. They recommended that interventions should be tailored to meet the specific needs of students based on their location, whether urban, peri-urban, or rural. By doing so, educational and health institutions can help bridge the information gap, ensuring that all students, regardless of where they live, have equitable access to relevant and age-appropriate health information. This approach is essential for promoting inclusive health education and reducing inequalities in health knowledge and outcomes among adolescents.

Fourth, the sex variable had a positive beta coefficient. However, this relationship was not statistically significant. Similarly, the education level of the parents had a negative beta coefficient. Nevertheless, this variable was also not statistically significant. This lack of significance could be due to the fact that most students in the study reported that their parents had formal education ranging from secondary school to a bachelor's degree. As a result, there may have been limited variation in parental education levels, making it difficult to detect a meaningful difference in how parental education influences students' access to or need for health.

4.2.4 Health Information Accessibility among Secondary Schools' Students

The results showed that the most highly accessible health information was related to types of food for a balanced diet. This implies that the most accessible health information in the study area was nutrition-related. One possible reason for this is the availability of nutrition topics in the science subject, which students are taught in school. This enables them to access information regarding the types of food to consume to maintain a balanced diet. These findings are consistent with a study by Kundu *et al.* (2024), which reported high access to nutrition information among secondary students. Similarly, a study by Harrison *et al.* (2023) revealed that adolescents aged 11 to 19 reported high access to nutrition information from multiple sources, including television, radio, and parents.

In addition, the second most accessed category of health information among students was related to physical exercise for the prevention of obesity. This relatively high level of access may be attributed to the structured inclusion of sports and physical education in the school timetable. Many schools actively promote student participation in games and athletic competitions, creating an environment where physical activity is not only encouraged but also integrated into daily routines. These activities likely increase students' exposure to and understanding of the importance of regular physical exercise in maintaining a healthy body weight and preventing obesity. This provides an opportunity for students to practice and understand so they can be selected to represent their class." This points out that there is empowerment of knowledge to students through physical exercise, which increases their access to information.

Furthermore, the biology curriculum in secondary schools often addresses critical health-related topics, including the consequences of poor nutrition and lifestyle choices. Within this context, students are taught about the health risks associated with being overweight or obese, as well as effective strategies for weight management. These lessons reinforce the significance of regular physical activity as a preventive health measure and provide students with both the knowledge and motivation to engage in healthy behaviors. Supporting these findings, Kalabamu *et al.* (2020) conducted a study among secondary school students in Kinondoni Municipal, Dar es Salaam, and found that a majority of participants reported regularly participating in physical sports activities. This suggests that students not only have access to information about physical exercise but also opportunities to put that knowledge into practice through school-based programs. The combination of academic instruction, structured physical activities, and competitive sports likely contributes to students' overall awareness and engagement in physical exercise as a tool for obesity prevention.

Moreover, the third category of health needed information was those related to access to health information topics, related to stress management techniques, and substance abuse prevention and support. A possible explanation for the relatively moderate access to these topics could be the lack of trained experts and structured programs that raise awareness about managing stress and preventing substance abuse. During adolescence, students are often curious and eager to experiment with various aspects of life, including substances. However, since substance use is generally not socially accepted, some engage in it secretly. Additionally, many students may lack proper psychological support and accurate knowledge on how to cope with stress, which can increase their vulnerability to substance use. Therefore, there is a need for each school to have trained professionals who can provide guidance on stress management and deliver effective programs related to substance abuse prevention and support.

The least accessed health information topics were the prevention of sexually transmitted diseases (STDs) and puberty changes. Possible reasons for this low access may include the absence of comprehensive or well-structured sex education programs in some schools. These programs often lack coverage of essential topics such as STDs due to a shortage of well-trained and knowledgeable health educators. Additionally, while the biology syllabus includes content on puberty changes, it was revealed that only three students mentioned learning about this topic in class. Further classroom observations indicated that some students were reluctant to ask questions during lessons, possibly due to embarrassment or discomfort discussing sensitive subjects. Msovela *et al.* (2025) conducted a study focusing

on adolescents' knowledge of puberty and menstruation and found that students had a limited understanding of these topics. These findings suggest a clear need for tailored educational programs aimed at enhancing students' access to accurate information about sexually transmitted diseases and puberty-related changes prevention of early pregnancy.

4.2.5 Socio-Demographic Characteristics Influencing Health Information Accessibility of Secondary Schools' Students

First, age significantly influenced positively the accessibility of health information needs. This implies that older students have greater access to health information. A possible explanation for this finding is that older students tend to be more mature and are more likely to be aware of and utilize various sources of information, thereby increasing their chances of accessing health-related content. This finding is consistent with the study by Fastrich *et al.* (2024), which found that an increase in student age is associated with a higher ability to search for and retrieve information.

Second, the class level of the students significantly influenced their access to information. The results' implication is that the students in higher classes had greater access to health information. A possible explanation for this finding is that as students advance in their education, their knowledge and skills improve, enabling them to search for information more effectively, become more aware, and gain confidence in seeking information, including topics related to health. Similarly, a study by Jatu *et al.* (2024) revealed that students in higher grades demonstrated better information access and evaluation skills compared to those in lower grades. In addition, Lugard (2023) found that students in higher grades exhibited greater ICT awareness and usage than their counterparts in lower grades. This trend was attributed to increased exposure to ICT resources and more opportunities to integrate technology into their learning processes. Greater access to ICT resources may, in turn, enhance access to various types of information, including health-related information.

Similarly, sex has a negative beta coefficient means that female student had higher levels of access to health information compared to their male counterparts. One possible explanation is that female students are active in discussing or seeking information about health, particularly topics related to sexual and reproductive health. Despite this trend, the variable was not statistically significant, suggesting that the difference in access between male and female students may be due to chance or influenced by other unmeasured factors. This is contrary to the study by Chekol *et al.* (2023) revealed that boys scored higher in most domains of information search than girls.

In addition, the education level of the head of household showed a positive beta coefficient of 1, indicating a slight positive relationship between parental education and students' access to health information. This finding suggests that more educated parents are likely to value health education and provide better health-related guidance and resources to their children. Nonetheless, this relationship was also not statistically significant, meaning that the level of education of household heads was not a significant factor in determining access to health information for students in this study. This is contrary to a study by Pufall *et al.* (2026), which found that parents' education was linked to increased awareness and discussion of health issues in the household.

The results of the regression analysis revealed that the student's place of residence had a negative beta coefficient. This implies that students residing outside the study area or school locality had lower access to health information than those residing within the area. This could potentially be explained by differences in access to school-based programs, community health initiatives, or local media campaigns that are more readily available within the immediate school environment. However, this relationship was not statistically significant, indicating that place of residence may not be a strong predictor of access to health information among secondary school students.

Generally, the findings suggest that while there are observable trends relating to residence, sex, and household education level, none of these variables had a statistically significant influence on students' access to health information. This implies that other factors not included in the model may play a more important role in determining access.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Access to health information is crucial for enabling secondary school students to reduce their risk of health-related problems, as improving personal health outcomes depends on both access to and proper use of such information. This study concludes that students have a strong need for health information on key topics, including the prevention of sexually transmitted diseases (STDs), dental care and oral hygiene, puberty and bodily changes, and early pregnancy prevention.

Younger students have greater health information needs compared to older ones. Similarly, students in lower classes have higher information needs than those in higher classes. Students residing outside the locality have greater

information needs than those living within it. While older students and those in higher classes have greater access to health information, their perceived need for it tends to be lower.

5.2 Recommendations

The study recommends the following actions to enhance students' access to health information: Establishing school health clubs in each participating school within the next academic year, guided by trained health professionals, to facilitate peer-led health education programs addressing highly needed information on topics such as STIs and puberty. Distribute printed health education materials focusing on sexual and reproductive health, puberty, and nutrition quarterly, with assessments of utilization and impact after one year. Tailor health communication strategies by considering students socio-demographic characteristics especially residence and age to optimize outreach efforts.

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