



## Factors influencing health information accessibility among secondary school students in Morogoro region, Tanzania

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### ABSTRACT

Access to health information is critical for secondary school students to make informed health decisions and adopt healthy behaviours. Access to such information is shaped by demographic, technological, cultural, and academic factors. This study investigated determinants of access to health information among secondary school students in Morogoro Region, Tanzania. The objectives were to identify factors associated with the availability of health information and to assess the magnitude and direction of these associations. The research was guided by the Ecological Health Information Seeking Model (EHIS) and employed a mixed-methods approach with a cross-sectional design. The selected schools had a total population of 4,752 students. From selected classes, 800 students formed the sampling frame, and Yamane's formula was used to obtain a sample of 271 students. For the qualitative component, 99 teachers were purposively selected as key informants. Additionally, 10 focus group discussions, each comprising six students, were conducted, resulting in 60 student participants. Quantitative data were collected through structured questionnaires, while qualitative data were obtained via focus group discussions and key informant interviews. Quantitative data were analysed using descriptive and inferential statistics, and qualitative data were analysed thematically. The findings revealed significant differences in students' technological literacy in accessing health information ( $p < 0.05$ ), with high proficiency observed in the use of social media and search engines. Age, grade level, participation in special training, computer literacy, and the availability of health information sources were positively associated with access to health information. Traditional beliefs emerged as a major barrier, particularly concerning sensitive topics such as sexual and reproductive health. Qualitative data corroborated the quantitative results, indicating that fear, stigma, and restrictive social norms constrain open discussion and access to health information among students. The study concludes that access to health information among secondary school students is influenced not only by the existence of demographic, technological, knowledge-based, and traditional factors, as well as the availability of information sources, but also by their interactions. Although digital platforms facilitate access, cultural barriers and limited digital health literacy persist as significant challenges. The study recommends strengthening school-based access to health information on all health topics, integrating digital health literacy into the curriculum, and promoting culturally sensitive policies that support adolescent-friendly access to health information.

**Keywords:** Health Information, Health Information Accessibility, Secondary School Students

ANOVA-Analysis of variance

DMRT-Duncan's Multiple Range Test

EHIS – Ecological Health Information Seeking Model

GEMR-Global Education Monitoring Report

FGD – Focus Group Discussion

ICT – Information and Communication Technology

OECD-Organization for Economic Co-operation and Development

SPSS- Statistical Package for the Social Sciences

UN- United Nations

UNFPA – United Nations Population Fund

UNICEF – United Nations Children's Fund

URT – United Republic of Tanzania

VIF- Variance Inflation Factor

WB- World Bank

WHO – World Health Organisation



## I. INTRODUCTION

Access to health information is a critical factor influencing individuals' health and well-being, including that of secondary school students (WHO, 2021). Access to information on topics such as reproductive health, stress management, and oral health is essential for equipping students to make informed health decisions, fostering healthy behaviours, and reducing disease risks (URT, 2018; Bishonge *et al.*, 2022; Hamilton–Ekeke *et al.*, 2020).

Globally, studies have reported that students face challenges accessing health information (Sambah *et al.*, 2023; Kamangu & Mbago, 2024). The outcomes of reported challenges include disparities in knowledge and in informed decision-making (Mambo *et al.*, 2022). According to WHO (2023), challenges in accessing health information are increasing among adolescents worldwide. Meanwhile, in Africa, the health information, particularly on drug abuse prevention, disease prevention, nutrition, sexual and reproductive health, mental health, and communicable diseases, is inaccessible among secondary school students; mostly in the rural settings of Nigeria and Ethiopia (Hamilton-Ekeke *et al.*, 2020; Bulto, 2021).

In Tanzania, access to health information among secondary school students remains limited. Despite the established policy that emphasises access to health information for secondary school students, its implementation has stalled (Ito *et al.*, 2022; Holst *et al.*, 2023). Scholars have documented several challenges affecting access to health information among secondary school students, including uneven access and limited availability of information on certain health topics (Mambo *et al.*, 2021; Amanu *et al.*, 2023; Wang *et al.*, 2023).

Although prior studies document inadequate access to health information and its negative consequences, there has been limited attention to the systematic examination of the factors influencing health information accessibility among secondary school students in the Morogoro Region, Tanzania. Addressing this gap is necessary to inform contextually appropriate interventions to improve students' access to health information.

### 1.1 Statement of the Problem

Smooth access to accurate health information is critical for empowering secondary school students to make informed health decisions (Bishonge *et al.*, 2022; WHO, 2021). However, secondary school students globally face limited access to important health information due to various factors that influence its accessibility (Kavana, 2021; León-Himmelstine *et al.*, 2021; WHO, 2023). Msovela *et al.* (2025) observed that a small fraction of secondary school students have access to health information. Students have limited opportunities to access face-to-face health education (Ngissa *et al.*, 2024; Triantafyllidi *et al.*, 2024).

The inadequacy of proper access to health information hampers adolescent students' ability to make informed choices and contributes to risky behaviours, such as unprotected sex, leading to issues like teenage pregnancies and sexually transmitted infections (Mavura *et al.*, 2022; Holst *et al.*, 2023; Tengia–Kessy & Kilenga, 2020; Nkata *et al.*, 2019; Ngissa *et al.*, 2024). Although uneven access to health information among secondary school students has been consistently documented, there is limited understanding of how various factors affect access differently across groups, particularly marginalised students in both rural and urban areas in Tanzania. Addressing this gap is essential for developing effective, context-specific health education policies and programmes that reflect the realities of Tanzanian students and foster informed health decisions and improved health outcomes.

### 1.2 Research Objectives

- i. Identify factors influencing health information accessibility among secondary school students, and
- ii. Determine the magnitude and direction of influence of these factors on health information accessibility.

## II. LITERATURE REVIEW

### 2.1 Theoretical Review

The Ecological Health Information Seeking (EHIS) Model, developed by Williamson (1999), guided this study. The model provides a comprehensive framework for understanding how demographic, cultural, technological, and social factors influence access to health information. It recognises that access to health information is shaped by interactions across multiple contexts rather than by individual characteristics alone, making it suitable for examining such access among secondary school students.

Drawing on the EHIS model, this study conceptualised health information access as a multi-dimensional process influenced by individual, interpersonal, and institutional factors. Access to health information depends on variables such as individual (intrapersonal) factors, including age, sex, class level, digital literacy, and awareness of key health practices. The second category of variables includes interpersonal factors, such as cultural and traditional influences and health information obtained from peers, family members, and teachers. The third category is institutional support, which



refers to the availability of health information through school resources, mass media, and the Internet. Guided by the EHIS model, the study assumes that these factors interact to influence students' ability to access, seek, and utilise health information effectively within the secondary school environment.

## 2.2 Empirical Review

### 2.2.1 Influence of Factors on Health Information Accessibility Among Secondary School Students

Previous studies suggest that access to health information among secondary school students is influenced by multiple interacting factors, including individual, social, institutional, and communication-related conditions. Access to accurate health information during adolescence is widely recognised as essential for promoting healthy behaviours and reducing risky practices (Kalolo & Kibusi, 2019). The literature consistently identifies age, class level, sex, digital literacy, health literacy, and health awareness as important determinants of adolescents' ability to seek, understand, and use health information. In particular, older students and those in higher grades tend to have better access because of increased educational exposure, improved literacy skills, and greater confidence in seeking information independently. Conversely, younger students often depend more on parents and teachers and may experience difficulties interpreting complex health information (Jatu et al., (2025). These findings indicate that access to health information improves with educational progression and the development of cognitive and information-seeking skills.

Existing literature also indicates that sex differences shape how students access and engage with health information. Evidence suggests that female students are generally more active in seeking health information, particularly on issues such as hygiene, nutrition, menstruation, and reproductive health (Dufour et al., 2016). This pattern is often attributed to social norms that encourage girls to be more attentive to bodily and reproductive health. In contrast, boys may face social expectations that discourage open discussion of health-related concerns, especially those related to mental and reproductive health. Such norms can reduce their willingness to ask questions, thereby limiting their access to essential health information (UNFPA, 2022). Overall, the literature suggests that gender norms can either facilitate or constrain adolescents' engagement with health information depending on socially constructed expectations.

The literature has further highlighted digital literacy as a key determinant of adolescents' access to health information in an increasingly digital environment. Studies suggest that students with stronger digital skills are better equipped to search for health information online, evaluate the credibility of sources, and interpret health messages from digital platforms. For instance, Livingstone et al. (2025) found that higher digital literacy reduces adolescents' reliance on misleading or unverified information from social media and websites, while Arias et al. (2023) similarly argue that digital competencies enhance effective access to reliable health information. Conversely, limited digital literacy has been associated with difficulties in assessing the accuracy of online content, thereby increasing exposure to misinformation. In response, scholars such as Alhodaib (2022) emphasise the need to integrate digital health literacy into school curricula to equip students with the skills required to critically access, evaluate, and use online health information effectively.

Health literacy and cultural beliefs significantly shape students' access to health information. Studies from Iran, Kenya, and Nigeria show that cultural restrictions on sensitive topics such as sexuality and reproductive health limit open communication between adolescents and adults, thereby reducing access to reliable information (Mutea et al., 2020; Kinaro et al., 2019; Amanu et al., 2023). Similarly, low health literacy can hinder students' ability to understand and apply available health information effectively. In contrast, environments that encourage open health discussions tend to enhance students' awareness and comprehension of health issues, indicating that cultural context and literacy levels can either facilitate or constrain access.

In addition, awareness of basic health practices influences students' health information-seeking behaviour. Students with prior knowledge of disease prevention, nutrition, sanitation, and physical activity are more likely to seek additional information from schools, media, and health professionals. WB (2022) notes that such awareness increases engagement in health education activities, whereas limited awareness reduces motivation to seek further information. For example, Sambah et al. (2023) found that many students in Northern Ghana were unaware of available health information websites, limiting their use of online resources despite having internet access.

Interpersonal relationships within families, peer groups, and schools play a central role in shaping students' access to health information. Parents and teachers are often regarded as reliable sources of age-appropriate guidance, while peers provide a more open space for discussing personal issues (UNICEF, 2024). However, peer-to-peer communication may also lead to the spread of misconceptions, as information shared is not always accurate. Cultural and traditional beliefs further influence communication within families and communities, particularly on sensitive topics such as sexual and reproductive health, thereby limiting adolescents' access to reliable information (Mutea et al., 2020; Kinaro et al., 2019; Amanu et al., 2023). Consequently, students may turn to informal sources that can be incomplete or misleading, as noted by Hailemariam et al. (2021), highlighting the importance of supportive family and school communication environments.



Institutional support within schools is also critical, as health education programmes, counselling services, health clubs, and libraries enhance structured access to accurate health information. UNESCO (2023) notes that such support improves awareness and encourages positive health behaviours, whereas limited services increase reliance on informal sources. In addition, mass communication channels, including radio, television, and digital platforms, contribute to adolescents' access to health information (Lim et al., 2022). However, disparities in access to technology and low media literacy can reduce the quality of information students receive, making the ability to evaluate information critically essential for effective use of mass media.

### 2.2.2 Magnitude and Direction Of Influence of These Factors on Health Information Accessibility

Existing literature shows that adolescents' access to health information is shaped by interconnected factors such as digital competence, trust in information sources, parental support, and age, with varying influence across contexts. Among these, digital and eHealth literacy are consistently identified as the strongest predictors, as they enable adolescents to locate, evaluate, and use credible health information effectively (Norman & Skinner, 2006; Van Kessel et al., 2022). Empirical evidence supports a positive relationship between digital literacy and health information-seeking behaviour, including a statistically significant association reported among Indonesian adolescents ( $p = 0.307$ ). Studies also highlight that effective online information seeking depends on skills such as search strategies and navigation ability, which tend to improve with age and experience (Hansen et al., 2003).

Trust in information sources also influences adolescents' willingness to engage with health information, with studies showing moderate positive effects on both disease- and fitness-related information-seeking behaviours (Hatamlah, 2024). In comparison, parental support plays a weaker but still significant role, mainly by shaping motivation rather than direct access (Borzekowski & Rickert, 2001). Overall, the literature suggests a hierarchy of influence in which digital literacy is most critical, followed by trust and interpersonal factors, with age serving as an enabling condition. However, most studies are conducted outside Tanzania and focus largely on online health information-seeking, leaving a gap in understanding how these factors operate among Tanzanian secondary school students.

## 2.3 Research Gap

Previous studies show that adolescents' access to health information is influenced by factors such as demographic characteristics, digital literacy, cultural beliefs, institutional support, and communication channels. However, most research has examined these factors separately, with limited focus on how they interact in the everyday experiences of secondary school students. In Tanzania, there is limited research specifically addressing how secondary school students in both urban and rural areas access and use health information, as well as how they experience related challenges within school settings. Therefore, this study seeks to examine these factors in an integrated manner to generate evidence that can inform context-specific health education programmes and improve school-based health information services.

## III. METHODOLOGY

### 3.1 Study Area

The study was conducted in the Morogoro Region, Tanzania, selected for its diverse natural setting encompassing both urban and rural secondary schools (Msollo & Majaliwa, 2025). Two districts, namely Morogoro Municipal and Ifakara, were selected. Morogoro Municipality was selected for its urban features and a more economically diverse population, including students from both high- and low-income families. In contrast, Ifakara has many students from lower socioeconomic backgrounds who often reside in remote areas. Previous studies have documented disparities and scarce access to health information across several health topics among secondary school students in urban and rural areas of the Morogoro Region (León-Himmelstine et al., 2021; Kavana, 2021).

### 3.2 Research Design

This study used a cross-sectional mixed-methods research design. The design was selected because it enabled the collection of both quantitative and qualitative data at a single point in time, permitting a comprehensive assessment of elements affecting secondary school students' access to health information. Quantitative data provided measurable evidence of patterns and associations, whereas qualitative data offered deeper understandings of students' and teachers' experiences and perceptions.

### 3.3 Study Population

The target population comprised secondary school students enrolled in selected secondary schools in Morogoro Municipality and Ifakara District. Teachers from the selected schools were also included as key informants to provide additional perspectives on students' access to health information.



### 3.4 Sample Size Determination

The selected schools had a total population of 4,752 students. From selected classes, 800 students formed the sampling frame, and Yamane's formula was used to obtain a sample of 271 students.

For the qualitative component, 99 teachers were purposively selected as key informants. Additionally, 10 focus group discussions, each comprising six students, were conducted, resulting in 60 student participants.

### 3.5 Sampling Procedures

Purposive sampling was used to select Morogoro Municipality and Ifakara District. Selected schools were also purposively chosen to represent urban and rural settings. Teachers were purposively selected for their knowledge and involvement in student health-related activities. Students for the questionnaire survey were selected using systematic random sampling from class registers. Participants for FGDs were purposively selected based on gender balance, age appropriateness, and willingness to participate.

### 3.6 Data Collection Methods and Instruments

#### 3.6.1 Questionnaire Survey

A standardised questionnaire was directed to 271 students to collect quantitative data on the study variables.

#### 3.6.2 Key Informant Interviews

Key informant interviews were conducted with 99 teachers to obtain in-depth insights on the subject under study.

#### 3.6.3 Focus Group Discussions

A total of 10 focus group discussions were conducted, each with 6 students, for a total of 60 students participating.

#### 3.6.4 Instrument Pre-testing and Reliability

The instrument was reviewed by experts and pre-tested with 30 students outside the study sample. Reliability was assessed using Cronbach's alpha, which demonstrated acceptable internal consistency. Consistent data collection procedures were followed to ensure reliability.

### 3.7 Measurement of Study Variables

#### 3.7.1 Information Accessibility

Health information accessibility was measured using a five-point Likert scale, ranging from 5 (very highly accessible) to 1 (not accessible), across 16 items. Furthermore, a health information access index was computed by summing the respondents' scores on all 16 items.

#### 3.7.2 Cultural

The cultural dimension was measured by asking respondents to indicate the extent to which they agreed with six statements about cultural determinants that impede access to reproductive health information. Responses were coded as 1 = Yes and 0 = No. A 'Yes' response implied that culture hinders young people's access to reproductive health information. The cultural index was then computed by summing the responses across the six items. Total scores ranged from 0 to 6. Using equal-interval classification, respondents were categorised into three levels: low (0–2), moderate (3–4), and high (5–6). A higher cultural index score indicates stronger cultural values and beliefs that hinder young people's access to reproductive health information. The total score is expected to range from 0 to 6. Dividing 6 by 2 yields 3, so the categories were categorised as ranges of 0 to 2 (low), 3 to 4 (moderate), and 5 to 6 (high).

#### 3.7.3 Access to Training

Access to training on various health topics was measured by attendance frequency, coded as: 5=Highly Frequent, 4=Frequent, 3=Moderate, 2=Rarely, 1=Not attended at all. The index was calculated by summing the scores. To a great extent, receiving training

#### 3.7.4 Awareness of Knowledge on Health

Awareness was measured by asking respondents about their knowledge of various health aspects. Responses were coded as "yes" (1) and "no" (0), after which an awareness index was computed.



### 3.7.5 Traditional Factors

The study assessed three traditional factors: age-based restrictions on sharing health information, restrictions on the use of certain medicines, and use of traditional health knowledge. Responses were coded as “yes” (1) and “no” (0), after which an index score was computed.

### 3.7.6 Digital Technology Literacy

The level of technology literacy was assessed based on respondents' ability to use various ICT devices to access health information. It was measured using a self-rated scale, coded as follows: 1 = not literate at all; 2 = low literacy; 3 = moderate/confident; 4 = high; and 5 = very high. An overall technology literacy index was subsequently computed.

### 3.7.7 Perceived Extent of Availability of the Sources of Health Information

Availability was measured using a five-point Likert scale and coded as follows: 1 = Very easily available, 2 = Easily available, 3 = Available, 4 = Moderately available, and 5 = Not available at all. This scale was applied to two categories of information sources in the respondents' area. Furthermore, an availability index for each category (interpersonal and mass communication sources) was computed by summing responses across all sources within that category.

### 3.8 Data Analysis

Quantitative data were analysed using IBM SPSS version 26. Descriptive statistics, including frequencies and means. One-way Analysis of Variance (ANOVA) was used to assess differences among groups, and Duncan's Multiple Range Test (DMRT) was employed for mean separation. Multiple linear regression analysis was performed to identify factors influencing access to health information among secondary school students. Prior to regression analysis, multicollinearity was assessed using the Variance Inflation Factor (VIF), and autocorrelation was examined.

Qualitative data from interviews and FGDs were analysed using thematic analysis. The data were transcribed, coded, categorised within themes, and interpreted to complement quantitative findings.

### 3.9 Ethical Considerations

Ethical clearance was obtained from the appropriate institutional authorities before the commencement of the study. Permission to conduct the study was sought from regional, district, and school authorities. Participation was voluntary, and informed consent was obtained from all participants. Participants were assured of confidentiality, anonymity, and the right to withdraw from the study at any stage without penalty. Data were stored securely and utilised exclusively for research purposes. The study adhered to the SUA Rules and Guidelines for Higher Degrees (2021) and other relevant ethical research guidelines.

## IV. FINDINGS & DISCUSSION

### 4.1 Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics of respondents are presented in Table 1. The findings show that more than half (60.2%) of the students who participated in this study were girls. Moreover, the age distribution shows that all students were adolescents, with the majority (72%) aged 16-18 years (Table 1). The respondents were distributed across Forms Two to Four, ensuring representation of different levels of secondary education.

**Table 1**

*Socio-demographic characteristics (n=271)*

| Characteristic | Category | Frequency (n) | Percentage (%) |
|----------------|----------|---------------|----------------|
| Sex            | Male     | 108           | 39.8           |
| Sex            | Female   | 163           | 60.2           |
| Total          |          | 271           | 100.0          |
| Age            | 13 - 15  | 66            | 24.3           |
| Age            | 16 - 18  | 195           | 72.0           |
| Age            | 19 - 23  | 10            | 3.7            |
| Total          |          | 271           | 100.0          |
| Study Year     | Two      | 103           | 38.0           |
| Study Year     | Three    | 79            | 29.2           |
| Study Year     | Four     | 89            | 32.8           |
| Total          |          | 271           | 100.0          |



## 4.2 Factors Associated with Health Information Accessibility

This section presents the factors associated with health information accessibility among secondary school students, as identified through the EHIS-guided analysis using multiple linear regression, including the magnitude and direction of observed associations. Table 2 presents the results. The findings showed that the variation inflation factor (VIF) ranged from 1.12 to 1.62, which is well below the commonly recommended threshold of 10 for independent variables (Pallant, 2013). This indicates that multicollinearity is not a concern in the model. The Durbin-Watson statistic was 1.67, which falls within the recommended range of 1.5 to 2.5, suggesting that the results are not autocorrelated (Kutner *et al.*, 2005). Moreover, the coefficient of determination ( $R^2$ ) was 0.466, indicating that the independent variables collectively explained 46.6% of the variance in health information accessibility, reflecting a moderate explanatory strength of the model.

Age significantly influenced access to health information, with a positive association ( $\beta = 2.29$ ) and a statistically significant effect ( $p < 0.05$ ). This means that for every one-unit increase in age, the health information accessibility score increased by 2.29, indicating a positive and substantive effect. Similarly, students' grade significantly influenced their access to information, with a beta coefficient of 1.69, and the variable was statistically significant ( $p < 0.05$ ). This means that students in higher grades had higher access to health information. However, the respondents' sex did not show a statistically significant association with access to health information.

**Table 2**

*Regression results on factors influencing health information accessibility*

| Factor                                                                              | Unstandardized coefficients | Unstandardized coefficients | Standardized coefficients | t      | P value | Collinearity statistics | Collinearity statistics |
|-------------------------------------------------------------------------------------|-----------------------------|-----------------------------|---------------------------|--------|---------|-------------------------|-------------------------|
| Factor                                                                              | B                           | Std. Error                  | Beta                      | t      | P value | Tolerance               | VIF                     |
| (Constant)                                                                          | 41.011                      | 11.948                      |                           | 3.432  | .001    |                         |                         |
| Gender                                                                              | 1.608                       | 1.510                       | .044                      | 1.065  | .288    | .893                    | 1.120                   |
| Age                                                                                 | 2.298                       | .618                        | .181                      | 3.719  | .000    | .650                    | 1.537                   |
| Grade                                                                               | 1.690                       | .975                        | .082                      | 1.732  | .044    | .684                    | 1.462                   |
| Cultural index                                                                      | -.799                       | .634                        | -.060                     | 1.260  | .209    | .673                    | 1.486                   |
| Training index                                                                      | .752                        | .202                        | .186                      | 3.715  | .000    | .619                    | 1.615                   |
| Awareness index                                                                     | .989                        | 1.326                       | .030                      | .745   | .457    | .941                    | 1.063                   |
| Traditional index                                                                   | -2.224                      | .882                        | -.115                     | -2.521 | .012    | .742                    | 1.347                   |
| Digital literacy index                                                              | .651                        | .207                        | .144                      | 3.150  | .002    | .739                    | 1.353                   |
| Availability of the perceived availability of the interpersonal communication index | 2.520                       | .252                        | .467                      | 10.013 | .000    | .709                    | 1.411                   |
| Perceived availability of mass communication index                                  | .282                        | .314                        | .038                      | .897   | .371    | .863                    | 1.159                   |

Multiple  $R=.774$ ,  $R^2=0.466$ ,  $p=0.00$ ; Durbin-Watson=1.68

Sum of Squares (Regression=48204.487, Residue=32361.461), Mean square (Regression=4820.449, Residue=124.467),  $F_{10, 260}=38.729$ ,  $p=0.000$ .

The beta coefficient for culture was negative ( $\beta = -.799$ ), suggesting a negative directional relationship, although the association was not statistically significant. This indicates that a one-unit increase in the cultural index score is associated with a 0.539 decrease in access to health information. This suggests that respondents facing cultural barriers are less likely to access health information. However, the variable was not statistically significant. The findings further revealed that the traditional index had a beta coefficient of -2.224, indicating that respondents facing traditional barriers have a lower likelihood of accessing health information, reflecting a negative direction of association. However, the effect was not statistically significant.

Furthermore, the results showed that receiving training significantly influenced access to health information. The beta coefficient for the training access index was .752, and the variable was statistically significant. This indicates that a one-unit increase in the training access index is associated with a 1.534 increase in access to health information, representing a relatively strong positive effect. These findings suggest that respondents with high access to training are more likely to have higher access to health information. The findings on digital literacy showed a beta coefficient of .651, which was statistically significant. This indicates that a one-unit increase in digital literacy is associated with a



0.962 increase in access to health information, indicating a moderate positive effect. These findings suggest that respondents with higher digital literacy are more likely to have greater access to health information.

Moreover, awareness of key health-related practices had a positive beta coefficient, indicating that greater awareness increases the likelihood that respondents will access health information. However, the variable was not statistically significant ( $p > 0.05$ ). The results showed that the perceived availability of interpersonal communication sources significantly influenced access to health information. The variable had the highest positive beta coefficient ( $\beta = 2.520$ ), indicating the strongest association among all predictors in the model. This implies that a one-unit increase in the availability score of interpersonal information sources results in a 2.520-unit increase in respondents' access to health information. Generally, the regression results show that access to health information is shaped by a combination of positively and negatively associated factors, with varying magnitudes of influence across individual, cultural, and communication-related variables, as detailed in later subsections.

#### 4.2.1 Technology Literacy

The results in Table 3 show a significant difference in respondents' levels of technology literacy, as measured by their ability to use different ICT devices to access health information ( $P < 0.05$ ), indicating variation in access to health information across different technology platforms. The highest reported levels of literacy were for using social media to access health information ( $\bar{x} = 2.80$ ) and for using search engines such as Google ( $\bar{x} = 2.60$ ), indicating relatively higher competence with commonly used digital platforms. The lowest level of digital literacy was observed in the use of health information storage devices ( $\bar{x} = 2.37$ ), reflecting comparatively limited skills with more specialised technologies.

The pattern of results shows that technology literacy is higher for widely accessible, frequently used ICT tools and lower for more technical or less familiar platforms, suggesting a directional difference in students' ability to access health information via different technologies.

**Table 3**

*Health information technology use*

| Health information technology            | Mean  |
|------------------------------------------|-------|
| Using a search engine such as Google     | 2.60a |
| Using social media to share Information  | 2.80a |
| Using health information storage devices | 2.37b |

*Sum of Squares (Between=24.431, within=1397.808), Mean square (Between=12.215, within=1.726), F (2,810) = 7.078,  $p=0.001$ , confirming statistically significant differences in technology literacy across ICT categories. Means with different superscripts in the same column are significantly different at  $P<0.05$*

#### 4.2.2 Cultural Factors

The results on cultural barriers presented in Table 4 show that the majority of students experienced low levels of cultural barriers to accessing health information, indicating a generally low magnitude of cultural constraint. Specifically, most respondents (84.1%) reported low levels of cultural barriers, which represents the dominant pattern among students. A smaller proportion (13.3%) exhibited a moderate level, while only 2.6% experienced a high level of cultural barriers, indicating limited exposure to strong cultural constraints. These findings suggest that cultural barriers are generally minimal among respondents, indicating a low overall level of cultural constraint. However, a notable minority still faces moderate-to-high cultural barriers, which are associated with reduced access to health information.

**Table 4**

*Level cultural factors*

| Level of Cultural Factors | Frequency (n) | Percentage (%) |
|---------------------------|---------------|----------------|
| Low                       | 228           | 84.1           |
| Moderate                  | 36            | 13.3           |
| High                      | 7             | 2.6            |
| <b>Total</b>              | <b>271</b>    | <b>100.0</b>   |

#### 4.2.3 Access to Training on Health-Related Topics

The results in Table 5 indicate significant differences in the extent of training received across various aspects of health information ( $P < 0.05$ ), demonstrating variation in training exposure across health-related topics. The findings further show that the majority of respondents received training on disease prevention ( $\bar{x} = 3.54$ ), physical exercise ( $\bar{x} = 3.43$ ), and healthy diet ( $\bar{x} = 3.55$ ), indicating relatively high levels of training in these health-related areas. Training on



reproductive and sexual health was reported at a moderate level ( $\bar{x} = 2.95$ ), indicating comparatively lower exposure than core preventive health topics. Furthermore, the results reveal that most respondents received comparatively little training in stress management ( $\bar{x} = 2.67$ ), the lowest level of training among the assessed health-related areas. Generally, the pattern shows that training levels were higher for general preventive health topics and lower for psychosocial and reproductive health areas.

**Table 5**

*Respondents' access to training in Health-Related Areas*

| Health-Related Areas           | Mean  |
|--------------------------------|-------|
| Reproductive and sexual health | 2.95b |
| Stress management              | 2.67c |
| Disease prevention             | 3.54a |
| Physical health                | 3.43a |
| Healthy diet                   | 3.55a |

Sum of Squares (Between=169.317, within=1677.919), Mean square (Between=42.329, within=1.243),  $F_{4,1350}=34.057$ ,  $p=0.000$ . Means with different superscripts within the same column differ significantly at  $P<0.05$ .

#### 4.2.4 Awareness of Health Practices

The results in Table 6 show that most respondents were knowledgeable about various aspects of health, indicating a high overall level of awareness of health practices. Specifically, 97.8% of respondents were aware of the importance of nutrition for growth, while 98.5% were aware of the benefits of exercise for health and the importance of frequent body check-ups. In addition, 97.0% reported being aware that sharing health information is beneficial. Awareness levels across all assessed health practices were consistently high, with reported awareness exceeding 94% for each item. The distribution indicates that respondents' awareness of basic preventive health practices was uniformly high.

**Table 6**

*Awareness of health practices*

| Health practices                                 | Frequency (N) | Percentage (%) |
|--------------------------------------------------|---------------|----------------|
| Nutrition is very important for growth           | 265           | 97.8           |
| Exercise is good for health                      | 267           | 98.5.          |
| Frequent body check-ups are important for health | 267           | 98.5           |
| Stress management is good for health             | 257           | 94.8           |
| Sharing health information is good               | 263           | 97.0           |

#### 4.2.5 Traditional Factors

The results showed that a small proportion of respondents (19.9%) reported that sharing health information with adults is not allowed in their society, indicating a low prevalence of age-based traditional restrictions. Less than half of the respondents (31.7%) indicated that only traditional knowledge is preserved and shared, suggesting the continued presence of customary practices in health information sharing. Additionally, about one-third of respondents (33.9%) reported no restrictions on the use of certain medicines, indicating that religious norms remain a relevant traditional constraint for a notable minority of students. Principally, traditional constraints were reported by a minority of respondents, with varying levels across age-related norms, knowledge traditions, and religious beliefs.

**Table 7**

*Traditional constraints on access to health information*

| Traditional Constraint Aspects                                        | Frequency (N) | Percentage (%) |
|-----------------------------------------------------------------------|---------------|----------------|
| In our society, sharing health information with adults is not allowed | 54            | 19.9           |
| In our society, only traditional Knowledge is kept and shared         | 86            | 31.7           |
| Our religious beliefs do not agree with some medical issues           | 92            | 33.9           |

#### 4.2.6 Availability of Information Sources in Respondents' Area

The results in Table 8 show a significant difference in the extent of information source availability across respondents' areas ( $P < 0.05$ ), indicating variation in the availability of different information sources.

**Table 8***Availability of Information Sources in Respondents' Area*

| Sources                                  | Mean  |
|------------------------------------------|-------|
| <b>Interpersonal Information Sources</b> |       |
| Peers                                    | 4.05a |
| Family                                   | 3.94a |
| Teachers                                 | 3.69b |
| <b>Mass Communication Sources</b>        |       |
| Media specify (radio, TV)                | 3.07c |
| Internet                                 | 2.63d |

*Sum of Squares (Between=396.093, within=1766.015), Mean square (Between=99.023, within=1.308),  $F_{4,1340}=75.697, p=0.001$ . Means with different superscripts within the same column differ significantly at  $P<0.05$ .*

The findings further indicate that interpersonal sources were the most available, more so than mass communication sources. Among these, peers ( $\bar{x} = 4.05$ ) and family members ( $\bar{x} = 3.94$ ) were the most highly available, representing the dominant sources of health information within respondents' immediate social environment. In contrast, the Internet was the least available source ( $\bar{x} = 2.63$ ), indicating lower accessibility of digital information sources compared to interpersonal sources. Overall, digital sources exist in theory but are limited in this context.

The results in section 4.2 show that health information accessibility among secondary school students is shaped by multiple interrelated factors, with clear variation in magnitude and direction across individual characteristics, technology literacy, training exposure, cultural and traditional contexts, and the availability of information sources. Higher levels of access were consistently observed for interpersonal communication channels, technology literacy, and training in core health areas. In contrast, lower levels were associated with traditional constraints, limited digital access, and uneven exposure to certain health topics.

### 4.3 Discussion

#### 4.3.1 Social Demographic Characteristics of the Respondents

The distribution indicates that the study captured adolescents at different stages of secondary education, allowing examination of variations in health information accessibility across age and educational levels.

The predominance of female students in the study reflects broader shifts in secondary school enrolment patterns in Tanzania, where girls' participation has increasingly surpassed boys'. National statistics indicate that in recent years, girls have consistently recorded higher enrolment and retention rates in secondary education than boys (World Bank, 2022; URT, 2023). This pattern may reflect ongoing improvements in girls' participation in secondary education in Tanzania.

These gender patterns are relevant because differences in educational participation may influence exposure to school-based health information. Evidence suggests that socioeconomic pressures compel many boys to enter the labour force at an early age to support household livelihoods. At the same time, cultural norms in some communities continue to prioritise boys' engagement in income-generating activities over continued schooling (The Chanzo, 2023). These dynamics contribute to gendered educational trajectories that shape students' exposure to school-based health information.

The age profile of respondents aligns with Tanzania's education policy, which allows children to enrol in primary education at age 6 and to transition to secondary school in early adolescence. As a result, most secondary school students fall within the adolescent age bracket, a developmental stage characterised by increasing autonomy, curiosity, and engagement with health-related issues. (Tarimo & Kavishe, 2017).

From the EHIS perspective, demographic characteristics such as age and educational level represent individual-level factors that influence adolescents' ability and confidence to seek and utilise health information.

#### 4.3.2 Technology Literacy

The findings indicate that students' access to health information through ICTs is shaped primarily by familiarity, ease of use, and everyday digital practices rather than by mere availability of technology. Platforms that are socially embedded and require minimal technical skills appear more accessible to students, whereas more structured or technical tools are used less frequently. Social media platforms and search engines emerged as the most commonly relied-upon digital channels for accessing health information. Their prominence reflects students' comfort with interactive, peer-driven environments where information is exchanged informally within trusted social networks. The limited reliance on health information storage devices further highlights the functional nature of students' technology literacy. Teachers noted that students rarely use such devices for academic or health-related purposes, attributing this to unfamiliarity and occasional lack of access. One teacher explained,



*“Many students do not know how to save or retrieve documents from storage devices, so they rely more on Google or social media to get information.”* (Teacher 1, 19/11/ 2024)

This preference underscores students’ inclination toward tools that offer immediate access and minimal technical complexity. These findings are consistent with the existing literature, which shows that secondary school students often exhibit uneven ICT literacy, with stronger competencies in social media use and weaker skills in structured information retrieval (Chereka et al., 2025; Menggo & Ndiung, 2024). Factors such as limited digital instruction, unstable internet connectivity, and inadequate ICT infrastructure have been shown further to constrain students’ effective use of diverse digital tools. Collectively, these patterns suggest that improving access to health information through technology requires not only expanding digital infrastructure but also strengthening students’ practical digital and information literacy skills. Within EHIS, technology literacy represents an individual capability that determines whether available information sources can be effectively converted into usable health knowledge.

#### 4.3.3 Cultural Factors Influencing Access to Health Information

The findings indicate that although cultural barriers to accessing health information among secondary school students are generally low, they continue to influence access to sensitive health topics, particularly sexual and reproductive health. Schools play an important role in reducing these barriers by providing structured, socially acceptable environments for health education, reflecting a gradual shift toward more open attitudes toward adolescent health information. However, age-based cultural norms and expectations of obedience to elders still discourage some students from seeking timely health information. As one participant explained,

*“I once asked my mother about how to protect myself from getting pregnant, and she told me to wait for the right time to be taught such things”* (Student 6, FGD2, 14/11/2024).

Traditional beliefs also shape access to health information, with students reporting that they learn health practices from both grandparents and teachers. One student noted,

*“In our community, we learn some remedies from grandparents, but teachers also teach us modern health practices”* (Student 3, FGD2, 14/11/2024), demonstrating the coexistence of traditional and modern health knowledge. Religious beliefs further influenced access for some students by shaping treatment choices, although they rarely prevented access altogether. Overall, the findings suggest that cultural factors no longer serve as absolute barriers but continue to influence the timing, content, and channels through which adolescents access health information. These findings are consistent with Chandra-Mouli et al. (2020) and Agyei et al. (2025), who reported that cultural barriers are declining but remain important for sensitive health issues, highlighting the need for culturally sensitive, age-appropriate, and evidence-based health education.

#### 4.3.4 Traditional Constraints on Access to Health Information

The findings show that traditions continue to shape adolescents’ access to health information through age-based restrictions, family authority, religious beliefs, and the coexistence of traditional and modern knowledge systems. These norms can delay discussions of sensitive health topics, as illustrated by a student who noted,

*“When I asked about how to protect myself, my mother told me that such things are taught when you are older”* (Student 4, FGD1, 11/11/2024).

Traditional knowledge also influences information pathways, with students reporting that ancestral remedies coexist with formal health education,

*“At home we are taught some traditional remedies, but at school we learn about modern medicine”* (Student 6, FGD4, 26/11/2024).

Religious beliefs were also found to affect access to and acceptance of certain health information among some students, with both students and teachers acknowledging that faith-based norms may restrict uptake of certain health messages. As one teacher explained,

*“Some faith questions the provision of some types of health information due to the religious beliefs that it is wrong”* (Teacher 2, Interview 2, 25/11/2024).

Despite these constraints, schools were consistently identified as supportive environments where students can access and discuss health information more freely, particularly on sensitive issues. Overall, the findings indicate that while traditional norms continue to influence the timing, content, and acceptance of health information, schools play a critical role in mitigating these barriers. These results align with studies in sub-Saharan Africa (Chandra-Mouli et al., 2020; Agyei et al., 2025), which report that cultural constraints are declining but remain context-specific, highlighting the need for culturally sensitive, age-appropriate health education.



#### 4.3.5 Respondents' Access to Training in Health-Related Areas

The findings indicate that access to health training is an important institutional pathway through which secondary school students obtain health information, although exposure is uneven across health domains. Training on nutrition, disease prevention, and physical exercise is well integrated into the school environment, largely because it aligns with the formal curriculum and public health campaigns. Students reported frequent instruction on hygiene, balanced diets, and disease prevention, particularly during outbreaks, as illustrated by one participant who noted,

*"We are taught about how to eat well and how to protect ourselves from diseases, especially when there is a problem like coronavirus"* (Student 6, FGD5, 28/11/2024).

These messages are reinforced through school routines such as physical education and sports activities, which help translate health knowledge into practice.

In contrast, training on reproductive and sexual health is less comprehensive and often limited by cultural sensitivities, with some topics only briefly addressed or omitted. As one student explained,

*"They teach us a little about body changes, but some topics are skipped"* (Student 6, FGD2, 14/11/2024).

Similarly, stress management and mental health receive minimal attention despite students reporting significant academic pressure. One participant noted,

*"We are stressed because of exams, but no one teaches us how to handle stress"* (Student 3, FGD4, 26/11/2024).

Overall, the findings support the need for comprehensive school health programmes integrating physical, reproductive, and mental health components. This imbalance reflects curricular priorities and institutional limitations, consistent with evidence from other low- and middle-income settings (WHO, 2021; Oyewo & Adebimpe, 2026). The results highlight the need for a more comprehensive and balanced approach to school health training that integrates physical, reproductive, and mental health education.

#### 4.3.6 Awareness of Health Practices

The findings indicate that awareness does not necessarily translate into improved accessibility, suggesting a gap between knowledge and access. The findings showed that students were mostly aware of the benefits of exercise, largely attributed to the routine inclusion of physical education, sports, and health promotion campaigns in schools. FGD findings supported this, with students linking exercise to improved health and disease prevention.

One participant stated,

*"When we play football or netball, we feel more active and less sick."*

while another noted,

*"Teachers always tell us that exercise helps the heart and reduces diseases"* (Student 5, FGD1, 11/11/2024).

These findings support maintaining compulsory physical education in schools and are consistent with Guthold et al. (2020) and the WHO (2022).

Similarly, awareness of the importance of frequent body check-ups (98.5%) was very high, reflecting the influence of school health services, medical screenings, and national health campaigns. Students acknowledged that early health screening helps prevent serious illness, with one participant stating,

*"Doctors say if you check your health early, you can avoid serious sickness."* At the same time, another added,

*"At school they sometimes check our eyes and weight, so we know check-ups are important"* (Student 4, FGD5, 28/11/2024). These findings agree with Hamilton-Ekeke et al. (2020) and UNICEF (2023).

Awareness of the importance of nutrition for growth (97.8%) was also high, reflecting effective nutrition education in schools and reinforcement at home. Students demonstrated a good understanding of balanced diets, with one explaining,

*"We are taught that if you do not eat a balanced diet, your body will be weak and you cannot grow well"* (Student 1, FGD5, 28/11/2024), while another added,

*"Even at home, parents tell us to eat vegetables and fruits so that we become healthy adults"* (Student 2, FGD5, 28/11/2024). These findings are consistent with Bishonge et al. (2022) and the WHO (2021) and support strengthening school nutrition education and school feeding programmes.

Students also demonstrated high awareness of the benefits of sharing health information (97.0%), largely through peer interactions, school health clubs, and digital platforms. One participant remarked,

*"If someone knows about a disease and tells others, we can protect ourselves."*

while another stated,

*"We share health messages in WhatsApp groups so that everyone can know"* (Student 6 & Student 2, FGD2, 14/11/2024). These findings suggest that peer education should be strengthened and aligned with the findings of Khursheed and Rasul (2024).

In contrast, awareness of stress management practices was low, reflecting limited mental health education and the normalisation of academic stress. Students reported receiving little guidance on coping with stress, with one noting,

*"We feel stressed because of exams, but no one teaches us how to deal with it"* (Student 1, FGD3, 15/11/2024),



while another added,

*“Sometimes you keep stress to yourself because talking about it is seen as weakness”* (Student 4, FGD3, 15/11/2024). These findings are consistent with Rijal et al. (2023) and WHO (2023), highlighting the need to integrate mental health education, guidance and counselling, and psychosocial support into secondary school programmes.

#### 4.3.7 Availability of Health Information Sources in Respondents’ Area

The findings indicate that students primarily access health information through interpersonal sources, with peers emerging as the most available and preferred source because they are perceived as approachable, relatable, and non-judgmental when discussing health issues. Family members also play a significant role by providing health guidance, although cultural norms often limit discussions on sensitive topics such as sexual and reproductive health. Teachers are regarded as credible sources of health information but are less accessible for personal health concerns due to the formal nature of student–teacher interactions. Mass media, particularly radio and television, provide general health information but are considered less relevant to adolescents’ specific needs, whereas the Internet is the least accessible source due to limited smartphone ownership, high data costs, and unreliable internet connectivity. Although mass communication channels may exist, their effectiveness depends on relevance, trust, affordability, and students’ ability to engage with them.

As reflected in the focus group discussions, students explained that,

*“It is easier to ask friends because they understand us and will not judge”* (Student 6, FGD5, 28/11/2024). Another participant noted that,

*“The Internet is expensive, and not all students have phones”* (Student 3, FGD4, 26/11/2024).

Overall, the findings demonstrate that students primarily rely on trusted interpersonal relationships for health information, while institutional, media, and digital sources play complementary but constrained roles. These findings are consistent with studies by Mcharo et al. (2021) and Kharsynniang (2024), which similarly found that adolescents in low- and middle-income countries rely predominantly on peers and family members because of their accessibility and trustworthiness.

#### 4.3.8 Factors Influencing Health Information Accessibility

Age and grade level were significant positive predictors, with older students and those in higher classes having greater access to health information due to increased maturity and exposure. This was supported by a teacher who stated, *“Older students understand health issues better and are more confident in asking questions”* (Teacher 3, Interview 3, 27/11/2024).

These findings are consistent with Sawyer et al. (2018) and UNICEF (2023). Gender was not significantly associated with access, indicating similar opportunities for male and female students. Meanwhile, the digital literacy also significantly enhanced students’ ability to locate, evaluate, and use health information.

Although cultural factors were not statistically significant overall, traditional practices had a significant negative effect on access to sensitive health information, showing that religious continue to influence information seeking. Health training was a significant positive predictor, demonstrating the importance of structured school-based health education, whereas awareness alone did not significantly improve access. Furthermore, interpersonal sources, particularly teachers, peers, and family members, were the strongest predictors of access, while mass media did not significantly predict access. Overall, the findings support the Ecological Health Information Seeking Model, demonstrating that access to health information is shaped by the interaction of individual characteristics, social relationships, school support systems, and cultural influences, with interpersonal and school-based factors playing a more important role than the mere availability of information. Secondary school students’ health information accessibility is determined less by the existence of information sources and more by the interaction between interpersonal support, training opportunities, digital literacy, and sociocultural environments.

## V. CONCLUSION & RECOMMENDATIONS

### 5.1 Conclusion

Guided by the Ecological Health Information Seeking (EHIS) Model, this study found that health information access among secondary school students in the Morogoro Region is shaped by the interaction of individual, social, institutional, and cultural factors. Age, class level, digital literacy, health training, and interpersonal communication positively influenced access, while traditional norms limited access to sensitive health topics. Peers, teachers, and family members were key sources of information, whereas limited Internet access restricted use of digital health resources. The findings confirm that access to health information depends not only on awareness but also on supportive school environments, interpersonal relationships, and digital skills. The study highlights the importance of school-based and interpersonal systems in facilitating adolescents’ access to health information.



## 5.2 Recommendations

The Ministry of Education and the Ministry of Health should strengthen school health education to focus on both awareness and practical skills for accessing reliable health information. Digital and information literacy should be integrated into the secondary school curriculum, supported by teacher training and improved ICT infrastructure. School health programmes should provide balanced coverage of physical, reproductive, and mental health, with greater attention to stress management and psychosocial wellbeing. Furthermore, Schools should strengthen peer education, counselling services, and teacher–student communication as key channels for health information. Health education should involve parents and community stakeholders to address cultural barriers while respecting local values. Future research should use longitudinal and comparative approaches to examine changes in adolescents’ access to health information across contexts.

## Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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