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HIV Knowledge, Attitudes, and Information Sources Among Adolescents in Rural Philippines

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***Abstract*—** Adolescents remain vulnerable to HIV due to gaps in knowledge, persistent stigma, and reliance on informal information sources, particularly in rural settings. This study examined HIV knowledge, attitudes toward people living with HIV (PLHIV), and sources of HIV-related information among 236 senior high school adolescents in a rural public high school in Albay, Philippines using a descriptive cross-sectional design. Data were collected through a validated self-administered questionnaire and analyzed using descriptive statistics and multiple linear regression. Findings showed that adolescents demonstrated good knowledge of HIV transmission and prevention but had substantial misconceptions regarding casual transmission and HIV treatment. Attitudes toward PLHIV were generally supportive yet conditional, with lingering stigmatizing views in everyday social interactions. Social media emerged as the primary source of HIV-related information. Regression analyses indicated that higher grade level was associated with better HIV knowledge and more positive attitudes, while exposure to a greater number of information sources was negatively associated with both outcomes. These findings underscore the need for structured, school-based and digitally integrated HIV education that corrects misconceptions and addresses stigma among adolescents.

***Keywords*—** HIV knowledge; adolescents; attitudes toward PLHIV; information sources; rural Philippines.

I. INTRODUCTION

The human immunodeficiency virus (HIV) is a significant international public health issue despite decades of scientific advancements in the prevention, diagnosis and treatment of the virus. HIV infects the immune system, in this case, CD4+ T lymphocytes, which inhibits the immune system to respond to infections and some types of cancer and, in the case of no treatment, can lead to the development of acquired immunodeficiency syndrome (AIDS) (U.S. Department of Health & Human Services, 2023; World Health Organization [WHO], 2024). With the development of antiretroviral therapy (ART), HIV is no longer a quick killer and is now a chronic condition that can be dealt with by several individuals who continuously have access to healthcare services. However, HIV still has a big burden in the whole world. The Joint United Nations Programme on HIV/AIDS (UNAIDS, 2023) estimates that about 39 million individuals had HIV in 2022 around the world, and millions of individuals are newly infected every year. These statistics emphasize that medical innovations cannot be used to terminate the epidemic without similar improvements in education, reduction of stigma, and equal access to prevention and treatment.

Teenagers and youth still lead in the world response concerning HIV. The stage of adolescence is a time of critical development that is unfactorially marked by the rapid physical, psychological, and social changes, exploration of sexuality, forming the identity and growing autonomy in making health-related decisions (WHO, 2021). According to the World Health Organization, adolescence is said to be window of opportunity, and during this time, health-promoting behaviors can be developed and maintained throughout life. Yet, this is also the time period that is coupled with increased susceptibility to health endangering factors, such as HIV, especially in the cases where young people are not properly informed, socially supported and have access to youth-friendly services. Infection of HIV is disproportionately high in adolescents and young adults, particularly in low- and middle-income countries, which highlights the importance of age-specific and location-specific prevention measures (UNAIDS, 2022, 2023).

The increasing evidence in the global literature proves that the knowledge on HIV issues in adolescents is incomplete and disjointed. Although the idea that HIV is transmitted via sexual contact is widely known among young people, there are still many misconceptions about the possibility of non-sexual infection, i.e., by direct contact with HIV, by bites of the mosquito, or by sharing food (Agu et al., 2020; Choruma et al., 2021; Kumar et al., 2020; Seid and Ahmed, 2020). The literature carried out in a variety of contexts, such as sub-Saharan Africa,

South and Southeast Asia, and Europe, continues to show gaps in adolescents knowledge on HIV prevention, testing, and treatment, as well as, less awareness of treatment as prevention and lack of a cure to HIV (Nguyen et al., 2022; Obeagu et al., 2023; Teshale et al., 2020). These stereotypes are not just scholarly issues but directly relate to risk perception, sexual decision-making, and access to HIV testing and prevention services.

Attitudes towards people with HIV (PLHIV) are closely associated with knowledge gaps in adolescents. The problem of HIV-related stigma is still widespread in both cultures and situations, and it presents itself through fear, moral superiority, and social isolation of people who are suspected of being infected (Nyamweya et al., 2020; O'Connor, 2022). Adolescent-to-adolescent stigmatization can deter hormonal testing, diminish peer support of HIV-positive people, and enhance stillness of sexual matters. As it has been demonstrated in international studies, even in a situation where adolescents have moderate conditions of HIV knowledge, the negative attitudes to PLHIV might still remain, especially in an environment in which HIV is closely linked with moral transgression, deviance, or social shame (Amissah et al., 2021; Sari et al., 2022). Therefore, it is indicated that international guidelines and recommendations focus on the fact that successful HIV education should cover both cognitive and affective levels, i.e. should enhance the level of factual knowledge but also challenge the stigma and encourage empathy and human rights (UNAIDS, 2021; UNESCO, 2018).

The information channels that adolescents receive about HIV related matters are critical in the determination of the level of knowledge and attitude. Schools are traditionally considered as key platforms where formal, age-related sexual and reproductive health education and HIV prevention can be provided (Ross et al., 2021; UNESCO, 2018). Studies conducted in several countries have shown that comprehensive sexuality education (CSE) in schools is linked to increased HIV knowledge, more positive beliefs about PLHIV, and safer sex (Deveaux et al., 2022; Ross et al., 2021). Nevertheless, young people tend to use informal information sources, including friends, relatives, and online media, especially on social networks (Guse et al., 2022; Zuin et al., 2021).

The high growth rate of the digital media has changed the information environment of adolescents. Online interventions can help access sexual health information as soon as possible, decrease the obstacles associated with the stigma effect, and offer a level of anonymity to sensitive questions (Muessig et al., 2020). Simultaneously, unequal quality of information and high speed of spreading misinformation are the features of the social media ecosystem. High rates of health-related misinformation on the social media have been reported in systematic reviews, such as mistaken or deceptive information regarding HIV transmission, prevention, and treatment (Suarez-Lledo and Alvarez-Galvez, 2021). Research on the content of the platform of Tik Tok and YouTube on HIV matters has generated concerns regarding the prevalence of the incomplete, sensational, or erroneous information, which could strengthen myths instead of advanced evidence-based knowledge (Gabarrón et al., 2021; Gabarrón et al., 2021). These forces make it hard to distinguish reliable information among adolescents and emphasize the role of knowing the source of youths getting their information about HIV.

The case of adolescent HIV knowledge, perceptions, and information sources is an urgent matter that needs to be addressed in the context of the Philippines. The Philippines has been generally referred to as having one of the fastest rising HIV epidemics in the Asia-Pacific region (Bustamante and Plankey, 2022; Gangcuangco and Eustaquio, 2023). Recent statistics on national surveillance show that the number of new HIV diagnoses is steadily growing over the last decade, and adolescents and young adults make up a significant portion of reported cases (Department of Health - Epidemiology Bureau, 2024; HIV/AIDS & ART Registry of the Philippines [HARP], 2023). Such a trend continues even though there are positive legal and policy frameworks requiring age-based HIV education and the outlawing of discrimination of PLHIV.

A number of causes of the Philippine HIV epidemic have been stated such as stigma, misinformation, untimely testing, and unequal access to youth-duty-friendly services (Alibudbud, 2022; De Torres, 2020; Human Rights Watch, 2020). Sexuality as a taboo and moralistic discourses about HIV are not the only cultural norms that prevent open conversations about sexual health concerns within families, schools, and communities (Brown Undergraduate Journal of Public Health, 2024; O'Connor, 2022). Studies of Filipino students and young adults have reported the lack of comprehensive HIV knowledge and ambivalent attitude

to PLHIV, even in the context of formal education institutions (Bantique et al., 2021; James et al., 2022; Vitucio et al., 2020).

Though the current Philippine research has offered a very useful information, a significant part of the evidence is centered in the urban or semi-urban areas, like the Metro Manila and other urban areas. Conversely, rural and semi-rural provinces, in which access to health services, formal sexuality education, and credible information might be less strong, are underrepresented in the literature (Montegrico et al., 2024). Rural settings can also be defined by the increased impact of religious institutions, tighter social networks, and enhanced observability of individual behavior, all of which could further increase stigma and determine information-seeking behavior of adolescents (Sari et al., 2022; Rural Health Information Hub, n.d.).

Localized research is emphasized by the subnational data in the Philippines. HIV cases have been on the increase in the Bicol Region, and provincial reports in the region show that Albay has been a leading contributor to the regional burden (Calipay, 2024; CMDacoro, 2024). It has been reported by local health authorities that a significant number of new HIV cases are acquired by adolescents and young adults implying the situation on the national level. Nonetheless, the nature of surveillance data would not be sufficient in identifying how youth in rural school environments comprehend HIV, where they acquire information, and their perception of individuals with HIV. In the absence of this evidence, which is context-specific, any attempt to develop effective and youth-focused HIV education and stigma-reduction interventions may be ill-advised or culturally incompatible.

The overlap of the HIV knowledge, attitudes towards the PLHIV, and sources of information among the in-school adolescents is therefore important to understand. As it has been indicated by international evidence, the interaction between socio-demographic factors (age, sex, and educational level) and information environments influences the knowledge of adolescents concerning HIV-related attitudes (Gari et al., 2020; Montenegro-Idrogo et al., 2023). Research has demonstrated, among other things, that older teenagers and teenagers who are more exposed to formal education are more likely to show better HIV knowledge, and use of informal or unregulated sources of information may be linked with the maintenance of misconceptions and stigma (Amissah et al., 2021; Zuin et al., 2021). An analysis of these relationships in rural Philippine environments may deliver knowledge to supplement national survey data and develop more equitable and effective policies on health.

It is against this background that the current study has been carried out to fill the key gaps in the literature through concentrating on senior high school adolescents in a rural Philippine school. Precisely, the research objectives included (1) to estimate the degree of the HIV-associated knowledge and attitudes towards the individuals with HIV among the adolescents in senior high schools; (2) to establish the main sources of HIV-related information used by these adolescents; and (3) to establish which socio-demographic and information-related factors are correlated with HIV knowledge and attitudes towards people living with HIV. This study aims to add to the literature of creating both localized and school-based evidences on the development of both youth-focused and responsive HIV education and stigma-reduction interventions to the realities and information settings of adolescents in the rural Philippines.

II. METHODOLOGY

This study employed a descriptive cross-sectional quantitative design to examine HIV knowledge, attitudes toward people living with HIV (PLHIV), and sources of HIV-related information among senior high school adolescents in a rural Philippine setting. The study was conducted at a national high school in the Philippines. The target population comprised all senior high school students enrolled during the study period. Using Cochran's formula for finite populations, a minimum sample size of 236 students was determined from an estimated population of 600 learners. A stratified random sampling technique was applied to ensure proportional representation of Grade 11 and Grade 12 students, with equal allocation from each grade level. Data collection was carried out during regular school hours using a self-administered questionnaire completed anonymously by participating students.

Data were collected using a structured, validated questionnaire adapted from established HIV survey instruments used in international and national studies. The questionnaire consisted of four sections: demographic characteristics (age, sex, grade level, and religion); HIV knowledge (covering transmission,

prevention, and treatment); attitudes toward PLHIV; and sources of HIV-related information. Knowledge items were scored dichotomously (correct = 1, incorrect or "don't know" = 0) and summed to generate an overall HIV knowledge score. Attitude items were coded to reflect positive or stigmatizing responses and summed to produce an overall attitude score. Sources of information were assessed using a multiple-response checklist. The instrument was reviewed by content experts and pilot-tested to ensure clarity and cultural appropriateness.

Data were analyzed using descriptive and inferential statistical methods. Frequencies and percentages were used to summarize demographic characteristics, levels of HIV knowledge, attitudes toward PLHIV, and sources of information. To examine factors associated with HIV knowledge and attitudes, multiple linear regression analyses were performed, with knowledge and attitude scores as dependent variables and socio-demographic characteristics and number of information sources as independent variables. Statistical significance was set at $p < 0.05$. Ethical approval and permission to conduct the study were obtained from relevant school authorities, and written informed consent was secured from parents or guardians of participating students. Participation was voluntary, confidentiality was strictly maintained, and all data were reported in aggregated form.

III. RESULTS & DISCUSSION

HIV Knowledge and Attitudes Toward People Living With HIV Among Senior High School Adolescents

Table 1 presents the demographic characteristics of the 236 senior high school adolescents included in this study and shows that the respondents largely represent late adolescence, with the majority aged 16 and 17 years (85%). This age profile is important because late adolescence is a period characterized by increasing independence, heightened exposure to health risks, and greater engagement in decision-making related to sexuality and health.

The concentration of respondents within this age range suggests that the findings primarily reflect the perspectives of adolescents who are approaching young adulthood, a stage at which health-related knowledge and attitudes can have lasting implications.

The equal distribution of respondents between Grade 11 and Grade 12 further enhances the representativeness of the sample within the senior high school population and supports meaningful comparison across year levels in subsequent analyses.

Table 1. *Demographic Characteristics of Respondents (N = 236)*

Characteristics	Category	f	%
Age (years)	15	7	3.0
	16	99	42.0
	17	102	43.0
	18	25	11.0
	20	3	1.0
Sex	Female	127	54.0
	Male	109	46.0
Year Level	Grade 11	118	50.0
	Grade 12	118	50.0
Religion	Roman Catholic	221	94.0
	Iglesia ni Cristo	7	3.0
	Other religions	8	3.0

The sex distribution of respondents is relatively balanced, with females comprising a slight majority (54%). This balance provides an appropriate basis for examining potential differences in HIV knowledge and attitudes between male and female adolescents. The religious composition of the sample is highly homogeneous, with most respondents identifying as Roman Catholic (94%), reflecting the cultural context of the study setting. This homogeneity suggests that variations in HIV knowledge and attitudes observed in the study are less likely to be influenced by differences in religious affiliation and more likely to be shaped by shared cultural norms, educational exposure, and access to information. Overall, the demographic profile outlined in Table 1 establishes a coherent context for interpreting subsequent findings related to HIV

knowledge, attitudes toward people living with HIV, and information sources among senior high school adolescents in this rural setting.

Table 2 presents the level of HIV knowledge related to transmission among the adolescent respondents and reveals a pattern of uneven and fragmented understanding. A high proportion of students correctly identified anal sexual activity as a route of HIV transmission (86.44%) and recognized that a healthy-looking person can still transmit HIV (80.08%). These findings suggest that respondents possess relatively strong awareness of key sexual transmission pathways and the concept of asymptomatic infection. Such knowledge is essential for realistic risk perception, as it reflects an understanding that HIV transmission is not limited to visibly ill individuals and that certain sexual practices carry higher levels of risk.

Table 2. *Level of HIV Knowledge in HIV Transmission Among Adolescents*

Statement	Correct (f)	%
HIV can be transmitted through anal sexual activities	204	86.44
A healthy-looking person can transmit HIV	189	80.08
HIV is not transmitted through mosquito bites	149	63.14
HIV is not transmitted by sharing utensils or bathrooms	129	54.66
HIV is not transmitted through saliva, tears, or sweat	94	39.83

However, knowledge regarding non-sexual transmission and casual contact is substantially weaker, as reflected in the lower percentages for several items. Only 63.14% of respondents correctly stated that HIV is not transmitted through mosquito bites, and just over half correctly rejected transmission through sharing utensils or bathrooms (54.66%). Most concerning is the finding that fewer than half of the adolescents (39.83%) correctly recognized that HIV is not transmitted through saliva, tears, or sweat. This indicates that a majority of respondents hold misconceptions about everyday contact with people living with HIV, which can directly contribute to fear and avoidance behaviors. Overall, the results in Table 2 demonstrate that while adolescents show adequate knowledge of high-risk sexual transmission, significant misconceptions persist regarding casual contact, highlighting critical gaps that may reinforce stigma and hinder social acceptance of people living with HIV.

Table 3 presents the respondents' level of HIV knowledge related to prevention and shows generally high awareness of key preventive measures. A large majority of adolescents correctly identified abstaining from sexual activity as a way to reduce HIV risk (87.29%) and recognized that engaging in risky sexual behaviors increases the likelihood of HIV infection (86.02%).

These findings suggest that foundational prevention messages related to sexual behavior have been effectively internalized by most respondents. The high level of agreement across these items indicates a clear understanding of the link between sexual practices and HIV risk.

Table 3. *Level of HIV Knowledge in HIV Prevention Among Adolescents*

Statement	Correct (f)	%
Abstaining from sexual activity reduces HIV risk	206	87.29
Risky sexual activities increase HIV infection risk	203	86.02
Regular HIV testing helps monitor health status	193	81.78
Condom use reduces HIV risk	187	79.24
Injectable drug use increases HIV risk	174	73.73

Knowledge related to specific prevention strategies is also relatively strong, though slightly less consistent. Most respondents correctly acknowledged the importance of regular HIV testing in monitoring health status (81.78%) and recognized condom use as an effective method for reducing HIV risk (79.24%). Awareness that injectable drug use increases HIV risk was somewhat lower but still substantial (73.73%). While these results reflect a generally positive level of prevention knowledge, the gradual decline in correct responses across items suggests that more nuanced or practical prevention concepts may be less firmly

understood. Overall, the findings in Table 3 indicate that adolescents possess solid general knowledge of HIV prevention, yet continued reinforcement and clarification of specific preventive behaviors remain important to ensure this knowledge translates into consistent and informed health decisions.

Table 4 presents adolescents' knowledge regarding HIV treatment and reveals a critical gap in understanding. Only 37.71% of respondents correctly identified that HIV/AIDS currently has no cure, indicating that the majority of students hold an incorrect belief or are uncertain about the curability of HIV. This finding contrasts sharply with the relatively high levels of knowledge observed in the domains of HIV transmission and prevention, suggesting that treatment-related information is less clearly understood or less frequently emphasized among adolescents.

Table 4. *Level of HIV Knowledge in HIV Treatment Among Adolescents*

Statement	Correct (f)	%
HIV/AIDS currently has no cure	89	37.71

The misconception that HIV has a cure has important implications for both prevention and attitudes toward people living with HIV. Believing that HIV is curable may reduce perceived severity of infection and weaken motivation for preventive behaviors, such as consistent condom use or regular testing. It may also contribute to misunderstanding the purpose of lifelong treatment and the importance of early diagnosis. The results in Table 4 highlight an urgent need to strengthen education on HIV treatment, including the distinction between effective treatment and cure, to ensure adolescents develop a realistic and accurate understanding of HIV as a manageable but chronic condition.

Table 5. *Attitudes Toward People Living with HIV (PLHIV)*

Attitude Statement	Agree (f)	%
Should care for relatives/friends with HIV	193	81.78
Should maintain friendship with HIV-positive friends	181	76.69
HIV-positive teachers should continue teaching	179	75.85
HIV-positive students should continue studying	175	74.15
Should not buy from HIV-positive food sellers	156	66.10

Table 5 presents the respondents' attitudes toward people living with HIV (PLHIV) and shows a pattern of generally supportive but conditional acceptance. A large majority of adolescents expressed willingness to care for relatives or friends with HIV (81.78%) and to maintain friendships with HIV-positive peers (76.69%). Similarly, most respondents agreed that HIV-positive teachers should be allowed to continue teaching (75.85%) and that HIV-positive students should be allowed to continue their studies (74.15%). These responses suggest that many adolescents demonstrate empathy and a degree of social acceptance toward PLHIV, particularly within familiar or institutional settings.

Despite these positive attitudes, a substantial proportion of respondents still endorsed stigmatizing views, as reflected in the belief that one should not buy food or goods from an HIV-positive seller (66.10%). This finding indicates persistent fear of casual transmission and highlights a gap between expressed support and actual social behavior. While adolescents may conceptually support the rights of PLHIV to work and study, discomfort with everyday interactions suggests underlying misconceptions and stigma remain influential. Overall, the results in Table 5 indicate that attitudes toward PLHIV among adolescents are mixed, combining elements of compassion with lingering fear and discrimination, underscoring the need for interventions that explicitly address stigma alongside factual HIV education.

Taken together, the findings reveal a coherent pattern in which senior high school adolescents demonstrate uneven HIV-related knowledge alongside mixed attitudes toward people living with HIV (PLHIV). The demographic profile (Table 1) shows that the respondents are predominantly late adolescents, a group at a critical stage of forming long-term health beliefs and social attitudes. Within this context, the knowledge assessments indicate that adolescents possess relatively strong awareness of sexual transmission routes and

general prevention strategies (Tables 2 and 3). However, this strength is offset by persistent misconceptions regarding casual, non-sexual transmission, particularly involving saliva, sweat, and everyday contact. This imbalance suggests that HIV education received by adolescents may emphasize risk-related sexual behaviors while insufficiently addressing myths that underpin fear and stigma.

These knowledge gaps are reflected in adolescents' attitudes toward PLHIV (Table 5). While most respondents expressed supportive views in principle—such as caring for HIV-positive relatives, maintaining friendships, and supporting continued participation of PLHIV in school and work—a significant proportion still endorsed avoidance behaviors in routine social interactions, such as refusing to buy food from an HIV-positive seller. This contrast indicates a disconnect between cognitive acceptance and behavioral comfort, where adolescents may intellectually endorse inclusion but emotionally remain influenced by fear of transmission. When considered alongside the critically low level of treatment knowledge (Table 4), particularly the widespread misconception that HIV has a cure, the findings suggest that adolescents may underestimate the seriousness and chronic nature of HIV while simultaneously overestimating the risk posed by casual contact. Together, these patterns point to the need for HIV education that is not only informative but also corrective, addressing both biomedical realities and social implications of HIV.

These insights are consistent with existing research showing that adolescents globally and in low- and middle-income settings often demonstrate partial HIV knowledge characterized by accurate understanding of sexual transmission but persistent misconceptions about casual contact (Agu et al., 2020; Choruma et al., 2021; Kumar et al., 2020). Similar studies have documented that such misconceptions are closely linked to stigmatizing attitudes toward PLHIV, particularly in everyday social and economic interactions (Amissah et al., 2021; Nyamweya et al., 2020). Research has also shown that limited understanding of HIV treatment and the absence of a cure can weaken prevention motivation and reinforce distorted risk perceptions (Nguyen et al., 2022; Obeagu et al., 2023). In the Philippine context, prior studies among students and young people have reported comparable patterns of moderate knowledge, persistent stigma, and confusion regarding transmission and treatment, particularly outside major urban centers (Bantique et al., 2021; James et al., 2022; Montegrico et al., 2024). Collectively, these studies support the interpretation that the patterns observed in Tables 1–5 are not isolated findings but reflect broader structural and educational gaps that must be addressed to improve adolescent HIV knowledge and reduce stigma.

Sources of HIV-Related Information Among Senior High School Adolescents

Table 6 presents the sources of HIV-related information among senior high school adolescents and shows a clear reliance on informal and mass-mediated channels. Social media is the most frequently cited source (89.83%), followed by television (74.58%), indicating that adolescents primarily obtain HIV information from platforms designed for rapid content consumption rather than structured health education. This heavy dependence on social media suggests that adolescents are exposed to a wide range of HIV-related content with varying levels of accuracy, which may contribute to inconsistent understanding of HIV transmission, prevention, and treatment observed in earlier findings.

Interpersonal sources also play a prominent role, as shown in Table 6, with friends (70.76%) and family members (66.95%) commonly identified as information sources. While these channels offer accessibility and perceived trust, they may also reinforce misinformation if accurate knowledge is not well established within social networks. Traditional and institutional sources—including the church (53.39%), radio (50.00%), and newspapers (29.66%)—were less frequently utilized, suggesting diminished influence of formal or traditional information channels in adolescents' health learning processes. Overall, the distribution of sources in Table 6 highlights a fragmented information environment in which adolescents rely more on digital media and peer communication than on validated educational platforms, underscoring the importance of strengthening accurate HIV information within the channels most frequently accessed by young people.

Table 6. *Sources of HIV-Related Information (Multiple Responses Allowed)*

Source of Information	f	%
Social media	212	89.83
Television	176	74.58

Friends	167	70.76
Family	158	66.95
Church	126	53.39
Radio	118	50.00
Newspaper	70	29.66
Sex education materials	62	26.27

The findings in Table 6 indicate that senior high school adolescents primarily obtain HIV-related information from informal, media-driven sources, with social media emerging as the most dominant channel. This pattern suggests that adolescents' understanding of HIV is largely shaped by platforms that emphasize speed, accessibility, and peer engagement rather than structured or professionally curated health education. While such platforms can increase exposure to HIV-related topics, reliance on social media may contribute to fragmented or inconsistent knowledge, particularly when information is presented without sufficient context or verification. The prominence of television as the second most common source further highlights the influence of mass media in shaping adolescents' perceptions of HIV.

Interpersonal networks also play a substantial role in adolescents' information environments. The high reliance on friends and family members suggests that HIV knowledge is frequently exchanged within close social circles, where trust and familiarity may encourage discussion but also allow misconceptions to circulate unchallenged.

The relatively lower use of institutional and traditional sources—such as the church, radio, and newspapers—indicates that formal or authoritative channels have a diminished role in adolescents' HIV information-seeking behavior.

Taken together, these patterns reveal a hybrid information landscape dominated by digital media and peer communication, which may explain the coexistence of strong knowledge in some areas and persistent misconceptions in others observed in earlier findings.

These insights align with existing literature showing that adolescents increasingly depend on social media and peer networks for sexual and reproductive health information, often at the expense of school-based or professionally guided education (Guse et al., 2022; Zuin et al., 2021). Studies have documented that while digital platforms can improve access to HIV information, they also facilitate the spread of misinformation and oversimplified messages that may reinforce myths about transmission and prevention (Suarez-Lledo & Álvarez-Gálvez, 2021; World Health Organization, 2020). Research from both global and Philippine contexts further indicates that limited engagement with structured sexuality education and health professionals is associated with persistent knowledge gaps and stigmatizing attitudes toward people living with HIV (Bantique et al., 2021; Montegrico et al., 2024). Collectively, these studies support the interpretation that the information-source patterns observed in Table 6 reflect broader challenges in ensuring that adolescents receive accurate, comprehensive, and stigma-reducing HIV education through the channels they most frequently use.

Socio-Demographic and Information-Related Determinants of HIV Knowledge and Attitudes Toward People Living With HIV

Table 7 presents the results of the multiple regression analysis examining factors associated with HIV knowledge among senior high school adolescents and shows that the model is statistically significant, explaining a substantial proportion of the variance in HIV knowledge scores ($R^2 = 0.568$, $p < 0.001$).

This indicates that the included socio-demographic and information-related variables meaningfully account for differences in adolescents' HIV knowledge. Among the predictors, year level and sex emerged as strong determinants, with Grade 12 students demonstrating significantly higher HIV knowledge scores than Grade 11 students, while male students exhibited significantly lower knowledge scores compared with their female counterparts.

These findings suggest that greater educational exposure within senior high school may enhance HIV knowledge, whereas male adolescents may be at a relative disadvantage in acquiring or retaining accurate HIV-related information.

Table 7. Multiple Regression Analysis of Factors Associated with HIV Knowledge

Predictor	β	SE	t	p-value
Age	−0.850	0.475	−1.79	0.075
Number of information sources	−1.263	0.189	−6.67	<0.001
Male sex	−3.443	0.974	−3.53	<0.001
Grade 12	3.017	0.792	3.81	<0.001
Religion	NS	—	—	>0.05

Model: $F(6,229)=50.14$, $R^2=0.568$, $p<0.001$

Notably, the number of information sources was significantly and negatively associated with HIV knowledge. This counterintuitive finding suggests that exposure to a larger number of information sources does not necessarily translate into better understanding and may instead reflect exposure to inconsistent, inaccurate, or conflicting information. Rather than reinforcing correct knowledge, multiple unregulated sources may contribute to confusion and misinformation, particularly in environments dominated by informal and media-driven channels. Age and religion were not significant predictors of HIV knowledge, indicating that differences in knowledge are less related to chronological age or religious affiliation and more closely linked to educational level, sex, and the quality or coherence of information exposure. Overall, the results in Table 7 highlight that who adolescents are and how they access information matter more for HIV knowledge than simple exposure alone, underscoring the importance of targeted, structured, and reliable HIV education within the school setting.

Table 8 presents the results of the multiple regression analysis examining factors associated with adolescents' attitudes toward people living with HIV (PLHIV). The overall model is statistically significant and explains a substantial proportion of the variance in attitude scores ($R^2 = 0.603$, $p < 0.001$), indicating that the included predictors meaningfully account for differences in adolescents' attitudes. Among the significant factors, age and year level emerged as important determinants. Increasing age was associated with less positive attitudes toward PLHIV, while being in Grade 12 was associated with more positive and accepting attitudes compared with Grade 11. This pattern suggests that while maturity alone does not guarantee reduced stigma, structured educational exposure at higher grade levels may play a protective role in shaping more supportive attitudes.

The number of information sources was strongly and negatively associated with attitudes toward PLHIV, indicating that greater exposure to multiple information channels corresponds to more negative or stigmatizing attitudes. This finding suggests that inconsistent or unverified information—particularly from informal or media-driven sources—may reinforce fear and misconceptions rather than promote understanding and empathy.

Male sex showed a marginally negative association with attitudes, suggesting a tendency toward less positive views, although this did not reach conventional levels of statistical significance. Religion was not a significant predictor, indicating that attitudes toward PLHIV in this sample are not primarily driven by religious affiliation but rather by age, educational level, and information exposure. Overall, the results in Table 8 highlight that educational progression and coherent information environments are key to fostering positive attitudes toward PLHIV, while fragmented information exposure may undermine stigma-reduction efforts.

Table 8. Multiple Regression Analysis of Factors Associated with Attitudes Toward PLHIV

Predictor	β	SE	t	p-value
Age	−0.334	0.145	−2.30	0.022
Number of information sources	−0.521	0.058	−9.02	<0.001
Male sex	−0.542	0.297	−1.82	0.070
Grade 12	1.044	0.242	4.32	<0.001
Religion	NS	—	—	>0.05

Model: $F(6,229)=57.95$, $R^2=0.603$, $p<0.001$

Taken together, these findings highlight a critical relationship between adolescents' information environments and their level of HIV knowledge. Table 6 shows that adolescents predominantly rely on social media, television, and peer networks for HIV-related information, while Table 7 demonstrates that the number of information sources is negatively associated with HIV knowledge. This pattern suggests that greater exposure to multiple information channels does not necessarily improve understanding and may instead reflect exposure to fragmented, inconsistent, or contradictory messages. Rather than reinforcing accurate knowledge, reliance on numerous informal sources may dilute key concepts and contribute to confusion, particularly when information is not structured or evidence-based.

The regression results in Table 7 further indicate that educational progression and sex are more influential determinants of HIV knowledge than age or religious affiliation. Grade 12 students exhibited significantly higher HIV knowledge scores than Grade 11 students, underscoring the role of cumulative educational exposure in strengthening understanding of HIV-related topics. In contrast, male students demonstrated significantly lower knowledge scores, suggesting differential engagement with or receptivity to HIV education. When interpreted alongside Table 6, these findings imply that formal educational settings may serve as a stabilizing influence on HIV knowledge, counterbalancing the potentially confusing effects of unregulated information sources. Overall, the results emphasize that the quality and coherence of information, rather than the sheer quantity of sources, are central to improving adolescents' HIV knowledge.

These insights are supported by existing research showing that adolescents increasingly obtain sexual and reproductive health information from social media and peer networks, which often provide inconsistent or inaccurate content (Guse et al., 2022; Zuin et al., 2021). Studies have documented that exposure to multiple unverified information sources is associated with persistent misconceptions about HIV transmission and prevention, particularly among young people (Suarez-Lledo & Álvarez-Gálvez, 2021). Research in both global and Philippine contexts further indicates that structured, school-based HIV education is associated with higher levels of accurate knowledge, while reliance on informal media-driven sources may undermine comprehension (Bantique et al., 2021; Montegrico et al., 2024). Collectively, these studies support the interpretation that the patterns observed in Tables 6 and 7 reflect broader challenges in adolescents' information ecosystems and underscore the importance of strengthening reliable, school-based HIV education within the channels most frequently accessed by young people.

IV. CONCLUSIONS

The research offers relevant information on the subject of HIV knowledge, the attitude towards people living with HIV (PLHIV), and sources of HIV-related information among the adolescent population in a rural Philippine environment. On the whole, the results show that adolescents have rather good experience with the knowledge of HIV sexual transmission and general preventive methods nevertheless they still show considerable misunderstandings in terms of casual transmission and HIV treatment. These gaps reveal that knowledge about HIV among adolescents is one-sided and incomplete, as well as that it contains some critical misunderstandings that could inhibit effective prevention and become a source of fear and stigma toward PLHIV.

Attitudinal results also indicate that adolescents have a blend of empathy and conditional acceptance of PLHIV. Although a majority of the respondents claimed to have a positive attitude towards the concept of caring about HIV-positive family members, friendship maintenance and permitting the PLHIV to be able to study or work, a significant number still supported avoidance practices in their daily social interactions. This gap between the stated support and the social comfort implies that stigma is still deeply embedded in the false beliefs about the risks of being transmitted during casual contact. This kind of attitudes points to the necessity to focus not only on factual knowledge, but also on social and emotional aspects of the education about HIV.

The paper has also highlighted the important role that the information environments play in influencing the knowledge and attitudes of adolescents towards HIV. The most common source of information that adolescents use is social media, mass media, and peer networks in terms of the HIV-related information, and regression analyses show that the more the sources of information the adolescents were exposed to, the less knowledge they had about HIV and the negative attitudes they developed. Such results can imply that information saturation and uncontrolled sources can lead to confusion and stigma instead of better

comprehension. Conversely, as one protective factor, educational progression in the school system was found to be relevant and stressed the role of structured, coherent, and age-appropriate HIV education in enhancing the outcomes of adolescents.

This finding suggests that school-based HIV education should be enhanced and standardized with specific focus on the need to correct misconception about casual transmission, to clarify the difference between HIV treatment and curing, and on stigma towards PLHIV. Interventions in education must not just be at the level of raising awareness but should also involve participatory and discussion-based techniques that would help develop empathy and break the fear-based notions. Since adolescents use social media extensively, there needs to be cooperation with educators, health officials, and digital platforms to get correct youth-friendly information about HIV into the areas that adolescents are likely to visit most of the time. Lastly, specialised interventions are to be created to reach male students and younger grades that might be more susceptible to lower HIV knowledge so that HIV education can be inclusive, regular, and responsive to the conditions of adolescents in rural settings.

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