

Implementation of Digital Literacy of Reproductive Health on Adolescents

M. Akbar Alwi^{1*}, Hadzmawaty Hamzah², Surya Syarifuddin³

¹Megarezky University, Indonesia, muh.akbaralwi@gmail.com

²Patria Artha University, Indonesia, hadzmawaty.hamzah@gmail.com

³Megarezky University, Indonesia, suryasyarifuddin@gmail.com

ARTICLE INFO

Article History:

Received February 25, 2026

Accepted March 20, 2026

Available online April 25, 2026

Kata Kunci:

Literasi Digital, Kesehatan Reproduksi, Remaja, Implementasi Pendidikan

Keywords:

Digital Literacy, Reproductive Health, Adolescents, Educational Implementation

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ABSTRAK

Literasi digital sangat penting bagi remaja karena mereka semakin bergantung pada internet dan media sosial untuk memperoleh informasi, termasuk informasi kesehatan reproduksi. Namun, keterampilan yang terbatas dalam mengevaluasi konten daring membuat mereka rentan terhadap misinformasi dan paparan digital yang berisiko. Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan pengetahuan dan keterampilan literasi digital remaja terkait kesehatan reproduksi. Kegiatan dilakukan di SMAN 21 Makassar dengan melibatkan 31 siswa melalui ceramah interaktif, diskusi, dan penilaian menggunakan kuesioner daring. Hasil menunjukkan bahwa sebagian besar siswa memiliki pemahaman yang baik tentang konsep literasi digital, ciri hoaks, dan sumber informasi yang valid. Namun, masih terdapat kesalahpahaman mengenai pilar literasi digital, dan media sosial tetap menjadi sumber utama informasi kesehatan reproduksi. Penguatan literasi digital di sekolah penting untuk membantu remaja menggunakan ruang digital secara bijak dan mencegah perilaku berisiko.

ABSTRACT

Digital literacy is essential for adolescents as they increasingly rely on the internet and social media to access information, including reproductive health information. However, limited skills in evaluating online content put them at risk of misinformation and harmful digital exposure. This community service program aimed to strengthen adolescents' knowledge and skills in digital literacy related to reproductive health. The activity was conducted at SMAN 21 Makassar involving 31 students through interactive lectures, discussions, and assessments using online questionnaires. Results showed that most students demonstrated good understanding of digital literacy concepts, hoax identification, and valid information sources. However, misconceptions remained regarding the pillars of digital literacy, and social media continued to be the primary source of reproductive health information. Strengthening digital literacy education in schools is essential to support adolescents in navigating digital spaces wisely and preventing risky behaviours.

INTRODUCTION

Nowadays, information and communication technology is developing rapidly throughout the world, including in Indonesia. This development is also accompanied by rapid internet and social media penetration among teenagers. The highest internet penetration in Indonesia is among the 13-18 age group. Almost all (99.16%) of this age group are connected to the internet. Approximately 70% of Indonesian users access the internet via mobile devices or cell phones (Danuri & Suharnawi, 2017). Meanwhile, 8.3 million school-age teenagers in Indonesia access the internet (Candrasari & Claretta, 2020; Kurnia & Astuti, 2017). Teenagers are glued to social media, and this constant connection has the potential to significantly impact their

understanding toward what they found on the internet. Unfortunately, they often do not critically evaluate the information they encounter online because they do not have literacy digital skill(Koliada, 2024).

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), digital literacy refers to the ability to define, access, manage, integrate, communicate, evaluate and create information safely and appropriately through digital technologies and networked devices for participation in social life(Law, Woo, De la Torre, & Wong, 2018). One of important aspects in digital literacy is 4 pillars of digital literacy namely skills digital, culture, safety and ethic digital. The four pillars of digital literacy was introduced by the Indonesian Ministry of Communication and Information Technology that aims to create a society that is not only digitally smart but also responsible and safe in using technology(Azanda, Syah, & Ayunda, 2023).

Various problems may arise from inappropriate or excessive internet use, including privacy violations, the spread of hoax information, cyberbullying, exposure to violent content, pornography, online sexual harassment, and internet addiction (Kurnia & Astuti, 2017). Pornographic content and sexual harassment are among the prominent issues resulting from the unwise use of digital media. Adolescence is a vulnerable period marked by increased risk of reproductive health problems. One study reported that 30% of female adolescents and 43% of male adolescents had not maintained their reproductive health adequately. In addition, 10.9% of school-going adolescents reported having engaged in masturbation, and approximately 5.1% had expressed a desire to have a same-sex partner (Maesaroh et al., 2019). A literature review revealed that Indonesian adolescents have engaged in various sexual risk behaviours, including holding hands, watching pornographic videos, and even engaging in sexual intercourse(A. Alwi, 2023)Another literature review reported that, although adolescents in Indonesia generally demonstrate good knowledge about HIV/AIDS, the proportion of those with poor understanding of the topic remains high(M. A. Alwi, Hamzah, Syarifuddin, & Karlina, 2025).

Adolescents need to possess adequate knowledge about reproductive health so that they develop an awareness of the importance of maintaining their reproductive health. Such knowledge and skills can also help prevent them from engaging in risky behaviours that may negatively affect their health. However, to protect adolescents from receiving incorrect or misleading information about reproductive health including misinformation or hoaxes from the internet they must also have strong digital literacy skills. Therefore, we conducted an educational activity for adolescents on digital literacy related to reproductive health as part of our community service. This program aimed to enhance adolescents' understanding of digital literacy and equip them with skills to identify credible or valid sources of reproductive health information. In addition, the activity sought to introduce adolescents to the four pillars of digital literacy, which not only encourage proficiency in using digital media but also promote wise, ethical, and safe online behaviour.

MATERIALS AND METHODS

This community service activity was conducted at SMA Negeri 21 Makassar and involved 31 students as participants. The program was delivered with an interactive educational session by integrating digital literacy with adolescent reproductive health. Adolescent participants were selected based on the consideration that this age group represents active users of the internet and social media, yet may not fully possess the ability to critically and responsibly evaluate and utilize health information. A digital literacy approach was chosen because it is believed to enhance

adolescents' capacity to filter and manage information particularly reproductive health information. Thus, they can avoid hoaxes and misinformation widely circulating online.

The implementation of the activity began with a preparation stage, which included coordination with the school, development of educational materials, and creation of evaluation instruments in the form of an online questionnaire using Google Forms. The educational content was structured based on the four pillars of digital literacy introduced by the Ministry of Communication and Informatics of the Republic of Indonesia (digital skills, digital culture, digital ethics, and digital safety). Additionally, the material covered topics such as the concept of digital literacy and its importance for adolescents, ethical use of social media, how to identify hoax information, and valid sources of reproductive health information, including websites from the Ministry of Health, BKKBN, UNICEF, Halodoc, and Alodokter.

In the class, this activity was started by asking participating to complete a questionnaire to assess their level of knowledge and behaviour related to digital literacy. The questionnaire consisted of two main components: (1) knowledge of digital literacy, including understanding of key concepts, the four pillars, and ways to identify accurate information; and (2) internet and social media use behaviours, covering duration of use, the most frequently used platforms, and common sources of reproductive health information accessed. The use of an online questionnaire was intended to simplify data collection, improve efficiency, and encourage students to utilize digital technology for positive academic activities. A total of 31 students completed the digital literacy knowledge questionnaire, while only 24 students agreed to complete the questionnaire on internet and social media use.

The next stage was the reproductive health digital literacy session, which was delivered through an interactive lecture and participatory discussion. During this session, participants were encouraged to share their experiences using social media and searching for health information. The facilitator guided the discussion to strengthen understanding of the four pillars of digital literacy. The material was presented using a laptop and projector, supported by real-life viral cases on social media to help students relate the topic to their daily experiences. The final stage was oral evaluations. The oral evaluation was carried out by asking two students to summarize the key points of the session.

RESULTS AND DISCUSSION

RESULT

Table 1 showed that most students demonstrated a good understanding of digital literacy. A total of 93.5% recognized that digital literacy is not merely the ability to use gadgets or social media, but the ability to use the internet wisely, safely, and responsibly. Only 3.2% still viewed digital literacy simply as gadget use, and none associated it solely with playing social media or creating multiple accounts. Regarding the importance of digital literacy, 87.1% stated that it is crucial because "there is a lot of information online and not all of it is true," A small proportion (12.9%) believed digital literacy is important only because "everyone has a smartphone."

Table 1. Knowledge about Digital Literacy

Knowledge	n	%
What is understood about digital literacy		
a. The ability to use gadget only	1	3,2
b. The ability to play social media	0	0

c. The ability to use the internet smartly, safely, wisely and responsibly	29	93,5
d. The ability to create multiple social media accounts.	1	3,2
The importance of digital literacy for teenagers		
a. Everybody has smartphone	4	12,9
b. There is a lot information on the internet and not all of it is true.	27	87,1
	0	0,0
c. To follow trend on social media	0	0,0
d. To get lots of followers		
One of digital literacy pillars related to personal safety		
a. Skill digital	9	29,0
b. Culture digital	1	3,2
c. Ethics digital	1	3,2
d. Safety digital	20	64,5
Pillars of digital literacy related to respecting personal and others' privacy, and not posting negative comments on social media		
	1	3,2
a. Skill digital	10	32,2
b. Culture digital	18	58,1
c. Ethics digital	2	6,5
d. Safety digital		
Characteristics of hoax information		
a. Using formal and valid source	0	0,0
b. Contains provocative title and is not yet confirmed the truth.	31	100
	0	0,0
c. Posted by a government agency	0	0,0
d. Contains scientific evidence and data		
One way to check the accuracy of information		
a. Believe it when it is viral	0	0,0
b. Asking friend's opinion	0	0,0
c. Using fact-checking sites such as cekhoax.id	31	100
d. Read comments other users	0	0,0
The sources of valid information		
a. Gossip and Instagram celebrity account	1	3,2
b. Kompas.com/BBC Indonesia/Tempo.co/Liputan6.com	28	90,3
c. WhatsApp groups	0	0,0
d. Comments on social media.	2	6,5
Definition of reproductive health		
a. Never been sick	1	3,2
b. Physical, memtal, and social health related to the reproductive system	30	96,8
c. Only about genitals	0	0,0
d. Only about pregnancy prevention	0	0,0
If find information about sexuality on the internet, the right first step to do		
a. Believe it because may people share it.	1	3,2
b. Share it to warm others	1	3,2
c. Check the source and its accuracy	26	83,9
d. Just ignore all such information	3	9,7

In terms of the four pillars of digital literacy, 64.5% correctly identified digital safety as the pillar related to data protection and online security. However, 29% misinterpreted it as digital

skill, and a few still confused it with digital culture or ethics. For the pillar relating to ethics, privacy, and respectful digital behaviour, 58.1% correctly chose digital ethics, while others selected digital culture or safety. Students showed excellent understanding of hoaxes, with 100% recognizing that hoaxes often contain provocative titles and uncertain information. Likewise, all students correctly identified fact-checking websites such as cekhoax.id as a proper method for verification.

Most students (90.3%) also identified credible news websites such as Kompas.com, BBC Indonesia, Tempo.co, or Liputan6.com as valid information sources. A small proportion still relied on social media comments or celebrity accounts. Knowledge of reproductive health concepts was also high: 96.8% correctly defined reproductive health as a state of physical, mental, and social well-being related to the reproductive system. Additionally, 83.9% stated that the first step when encountering information about sexuality online is to verify the credibility of the source.



Figure 1. The Process of Community Service in the Classroom

Table 2 indicated that most adolescents used social media at moderate to high intensity. Most of students (41.7%) used social media for 1–3 hours per day, 37.5% for 4–6 hours, and 12.5% for more than 6 hours, while only 8.3% used it for less than one hour. This indicates that adolescents spend substantial time in digital spaces, increasing their exposure to both accurate and misleading health information. Regarding how they assess online information, most students (79.2%) reported checking the source before believing it, whereas a small proportion read information without verification (4.2%) or immediately believed or shared it (8.3%).

When encountering negative content such as cyberbullying, 45.8% chose to respond with positive or calming comments, 25% preferred reporting or blocking the account, and 20.8% chose to remain silent. Only 4.2% admitted to participating in bullying. In terms of platform preference, Instagram was the most frequently used (33.3%), followed by TikTok (29.2%) and WhatsApp (29.2%). Only 8.3% accessed official news websites, and none relied on search engines like Google as their primary source. For sources of reproductive health information, most students accessed official websites such as Halodoc, Alodokter, the Ministry of Health, UNICEF, and BKKBN (62.5%), while 54.2% relied on social media platforms. A smaller proportion (29.2%) used YouTube.

Table 2. Behaviour in Using Internet/Social Media

Behaviour	n	%
Average time spent on social media		

a. < 1 hours	2	8,3
b. 1 – 3 hours	10	41,7
c. 4 – 6 hours	9	37,5
d. > 6 hours	3	12,5
What to do when reading news on social media		
a. Believe it immediately	2	8,3
b. Share it with friends immediately	2	8,3
c. Read it without checking the source	1	4,2
d. Check whether the source is reliable	19	79,2
What to do when you find an account bullying someone else.		
a. Provide bullying comments as well	1	4,2
b. Leave positive comments without bullying	11	45,8
c. Do not comment	5	20,8
d. Report or block the account	6	25,0
e. Share it as entertainment	1	4,2
The most frequently accessed social media everyday		
a. TikTok	7	29,2
b. Instagram	8	33,3
c. YouTube	0	0,0
d. WhatsApp	7	29,2
e. Facebook	0	0,0
f. Official news sites such as kompas.com, liputan6.com, etc.	2	8,3
g. Google / Searching sites	0	0,0
The information source of reproductive health usually accessed		
a. Social media (Instagram, Tiktok, Facebook)	13	54,2%
b. Official websites (Halodoc, Alodokter, Kemenkes, UNICEF, BKKBN)	15	62,5%
c. WA Groups	0	0,0
d. Youtube	7	29,2
e. Never search for reproductive health information	0	0

DISCUSSION

This community service was conducted to know knowledge of students about digital literacy, provide comprehensive information about digital literacy and to know behaviour of students in using internet or social media especially concern to reproductive health. This activity is expected to provide information and skill for students in using internet based on pillar of digital literacy.

Overall, students' digital literacy knowledge was in the good to very good range, particularly in understanding basic concepts, identifying hoaxes, and recognizing valid information sources. Most of students know that digital literacy is ability to use internet safely, wisely and responsibly. The concept is similar to definition provided by UNESCO that is digital literacy refers to the ability to define, access, manage, integrate, communicate, evaluate and create information safely and appropriately through digital technologies and networked devices for participation in social life. It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy, and media literacy (Law et al., 2018). The good knowledge of students in SMAN 21 Makassar was consistent with digital literacy index survey on adolescents in Indonesia. The survey revealed that digital literacy knowledge of teenagers in 4 cities (Bandung, Surabaya, Pontianak, and Denpasar) was very good (Nugroho & Nasionalita, 2020). This finding indicated this intervention can improve knowledge participants. This is also similar to result of community service on students in Banyuwangi regency (MA Alqodiri VIII

Kelir) showed that health education can increase students' knowledge about reproductive health particularly about early marriage (Trianita, Christiana, Hariani, & Primayanti, 2026)

However, improvement is still needed in distinguishing among the digital literacy pillars. Most of students did not know about pillar of digital literacy. While some of students who know the pillar gain the information from social media. Four pillars of digital literacy are launched by the Indonesian Ministry of Communication and Information Technology. There are 4 pillars of the digital literacy namely skill digital, digital culture, digital ethics, and digital safety. Generally, skill digital refers to the ability to use digital media, such as using mobile phones, computers, and other gadgets. Skill digital is the ability to use appropriate digital communication channels to communicate as a means of self-expression, building relationships, and interacting with others (Badri, 2022). Ethics digital focuses on ethics or etiquette when actively using the internet. Digital ethics consists of the word "ethics," meaning a person's attitude, behavior, and etiquette. Digital is defined as the technological systems and devices used. Therefore, in summary, digital ethics refers to a person's attitude, behavior, and etiquette when utilizing digital systems for various purposes and interests (Terttiaavini & Saputra, 2022). For example, refraining from insults or slander on social media, hate speech, and posting certain undignified content. Regarding ethics in the digital world, there is the term netiquette, also often referred to as cyber ethics. Netiquette is defined as the rules and procedures for using the internet as a means of communication or data exchange between groups of people in an internet-mediated system (Fahrimal, 2018)

Digital culture is about cultivating a strong cultural awareness in the digital space. Digital culture focuses on a fundamental understanding of the values of Pancasila and Bhinneka Tunggal Ika (Unity in Diversity) (Ministry of Communication and Information Technology). Furthermore, digital culture can be defined as social activities in the digital space while maintaining national insight, Pancasila values, and diversity (Ayu, Zulkarnaen, & Fitriyanto, 2022)

Meanwhile, safety digital means safeguarding and protecting in the digital aspect. This term focuses on digital identity and personal data online. Safety digital is the understanding that a person must protect themselves and their digital property while in a digital environment (Maulidia, 2022). Within digital safety, issues such as hacking, fraud, theft, data breaches, and other cybercrimes continue to increase as digital devices become more common and can be used to trick or deceive someone. Therefore, all digital accounts and digitally transmitted content must have their digital account information updated.

Despite good basic knowledge, social media usage behavior showed a relatively high intensity (≥ 1 hour/day for the majority of participants and > 6 hours/day for 12.5%) and a tendency for adolescents to access information more through social media platforms (Instagram, TikTok, WhatsApp) than through search engines or official websites. This is important because literature shows that social media plays a dual role: being a source of easily accessible information but also a primary route for the spread of mis-/disinformation and risky content for adolescents (e.g., impacts on mental health, health misinformation). Therefore, despite participants' high ability to recognize hoaxes, reliance on social media still increases the risk of exposure to inaccurate reproductive health information, especially if verification skills and source criticism are not consistently applied (Bozzola et al., 2022).

The finding that most students stated they would check the source first when encountering information about sexuality is an excellent indication of critical behavior, but other results show that some students still cite Instagram celebrities/gossip accounts as valid sources, indicating an inconsistency between knowledge and practice. The community service and research literature in Indonesia shows a similar pattern: brief interventions/education can raise awareness, but established social media behaviors (quick check habits, virality) are difficult to change without ongoing programs, curriculum reinforcement, and school/parental support. This suggests the need for more systemic follow-up activities (e.g., recurring modules, teacher and parent involvement, peer-education) to change long-term habits (Rusdy, 2021).

In terms of reproductive health literacy, almost all participants (96.8%) were able to provide correct answers about reproductive health, and the majority chose the verification step when encountering information about sexuality. However, many students remained confused by reproductive health terms. Almost all participants had never sought out reproductive health information on their own initiative out of a desire to learn more or expand their knowledge. Some students reported seeking reproductive health information when given an assignment related to it by their teacher. In searching information, they rarely use official websites (such as *kompas.com*, *bbc.com* and *Liputan6.com*). They also never use official websites (such as Halodoc, Alodokter, the Indonesian Ministry of Health, UNICEF, or the National Population and Family Planning Agency/BKKBN) to find reproductive health information.

All participants stated that this activity was crucial because they had never received such counseling before. Therefore, schools need to facilitate students with digital literacy and reproductive health education activities that are regularly implemented and integrated into classroom learning. With this kind of education, it is hoped that adolescents will not only receive information but also develop skills and awareness in interacting with social media, thereby preventing risky behavior in adolescents.

CONCLUSION

The digital literacy outreach program on reproductive health held at SMAN 21 Makassar is very important by students because it provided new knowledge and skills. The knowledge assessment results indicated that most students had a good basic understanding of digital literacy, particularly in recognizing misinformation, understanding valid sources of information, and understanding comprehensive reproductive health concepts.

This activity also demonstrated that social media remains the primary source for adolescents seeking reproductive health information. However, through this educational activity, participants demonstrated increased awareness of the importance of verifying information sources before believing or sharing them. Thus, this activity significantly contributed to strengthening adolescent digital literacy and reproductive health literacy and can serve as a model for relevant educational interventions in the digital era.

ACKNOWLEDGE

The authors would like to express their sincere appreciation to SMAN 21 Makassar for the support, cooperation, and opportunity to conduct this community service program. Our gratitude also goes to the school principal, teachers, and staff who facilitated the implementation of the activities from preparation to evaluation stages. We extend our thanks to the 31 participating students for their active engagement and enthusiasm throughout the sessions.

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