

<https://doi.org/10.48047/AFJBS.6.16.2024.3299-3309>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

THE USE OF MOBILE APPLICATION ON REPRODUCTIVE HEALTH LITERACY AMONG FEMALE ADOLESCENT WITH VISUAL IMPAIRMENT

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Volume 6, Issue 16, Dec 2024

Received: 15 Nov 2024

Accepted: 05 Dec 2024

Published: 25 Dec 2024

[doi:10.48047/AFJBS.6.16.2024.3299-3309](https://doi.org/10.48047/AFJBS.6.16.2024.3299-3309)

ABSTRACT

Background: Adolescents with visual impairment face challenges in obtaining reproductive health information. The use of mobile applications is one alternative that can be used to improve information accessibility by providing interactive and disability-friendly educational materials. This study aims to analyze the effect of mobile applications on reproductive health literacy of adolescent girls with visual impairment and compare the results in the control and intervention groups.

Methods: This type of research used a quasi experiment dengan desain pre and posttest control group design. The sample was 230 people divided into control and intervention groups of 115 people each using total sampling. Data collection methods using standardized instruments, namely Sexual Reproductive Health Literacy (SRHL) for sexual reproductive health literacy variables. Statistical analysis used paired sample t-test and independent sample t-test.

Results: The results showed that in the intervention group results of reproductive health literacy pre-test is 43.20 and post-test is 73.61. Meanwhile in the control group results of reproductive health literacy pre-test is 43.14 and post-test is 48.19. There was a significant difference between the control and intervention groups on the average reproductive health literacy ($p=0.000$) where the increase in scores in the intervention group was greater than the control group.

Conclusion: The results also show that there is an effect of mobile application on reproductive health literacy among adolescent girls with visual impairment in the intervention group, in addition results also showed that there was a difference in reproductive health literacy among adolescent girls with visual impairment in the control and intervention groups.

Keywords: Female Adolescent, Mobile Application, Reproductive Health Literacy, Visual Impairment

Introduction

World Health Organization said that adolescents are someone who are in the age range of 10 to 19 years (Parida et al., 2021). Adolescence had period of rapid sexual advancement and exploration, where they face various challenges, especially in developing countries. Adolescent reproductive health includes physical and emotional well-being that involves the ability to maintain health, prevent unwanted pregnancies, unsafe abortions, sexually transmitted diseases (STDs), HIV/AIDS, and avoid sexual harassment (Anggela et al., 2022; Ryskeldiyeva et al., 2023). According to a report by the UN Reproductive Health Organization, adolescent girls in developing countries are particularly vulnerable to issues such as early pregnancy, violence, HIV, and often have difficulty accessing sexual and reproductive health services. This includes lack of access to contraception and professional help during pregnancy and childbirth (Ryskeldiyeva et al., 2023). Another obstacle to reproductive health in vulnerable adolescent girls is their difficulty in making informed decisions about sex and fertility. Many adolescents feel pressured to follow their friends without questioning their actions, in order to maintain friendships, be accepted in the group, or avoid loneliness. They often engage in high-risk behaviors, such as smoking, drinking alcohol, running away from home, or having unprotected sex, due to peer pressure (Janighorban et al., 2022).

Adolescents and young adults aged 15 to 24 are at the highest risk of sexually transmitted diseases (STDs) due to increased sexual activity. Globally, about 2.1 million adolescents aged 10 to 19 are living with HIV. In Asia, there were 5.1 million cases, while Africa recorded the highest number with 19.4 million cases, and the Americas recorded 1.8 million cases. In Indonesia, West Java Province ranks second with 1,505 HIV cases, after East Java with 1,614 cases, followed by DKI Jakarta with 1,403, Central Java with 1,171, and Papua with 861 cases. This data indicates a lack of understanding among adolescents about healthy living, the risks of sexual activity, and the ability to reject unwanted relationships (Anggela et al., 2022).

Capacity of a person to acquire, process, and understand fundamental health information and services in order to make appropriate health decisions is known as health literacy. Reproductive health literacy can influence the ability of patients and families to understand the impact of current and future diseases on the reproductive system. This can be an aspect that supports individuals in increasing awareness of the importance of maintaining reproductive health (Nahata et al., 2020). WHO recognizes health literacy as a key aspect in reducing health inequalities. Health literacy refers to a wide range of knowledge and capabilities to access, understand, and apply health information in daily life so as to address reproductive health issues. Reproductive health literacy can prevent actions that are harmful to health and promote healthy behavior among young people by providing valid health information related to reproductive health (Amanu et al., 2023).

Visual impairment is a condition in which the eye has decreased function, namely the loss of the ability to see an object even with the use of assistive devices, such as lenses or glasses (Masud et al., 2022). According to the

WHO, this disorder can be a disorder of the visual system and visual function that is either congenital or accidental. Visual impairment can have a massive impact and negatively affect all aspects of life for the sufferer. Based on the results of the study, blind people are dominated by adolescent girls rather than adolescent boys (Heiba et al., 2023). Adolescents with visual impairment experience persistent dissatisfaction with their bodies which can lead to low self-esteem, anxiety, depression, social isolation, mental disorders and poor self-concept. In general, adolescents with visual impairment have fewer opportunities for education and awareness of pubertal sexuality and health compared to other normal adolescents. In addition, adolescents with visual impairment will gradually realize their physical, psychological and emotional differences with others. One of the differences is that they cannot use useful information to deal with the changes in puberty (Rogge et al., 2021).

With the development of internet technology, mobile applications are increasingly being used across all ages. The use of mobile applications provides convenience for daily life. Accessibility to information and connectivity among young people is the attraction of using mobile apps (Seah & Koh, 2020; Wang & Qi, 2021). Flexibility in accessing information is also a benefit of using mobile applications to increase knowledge in various fields, including health (Criollo-C et al., 2021). Browne said that mobile applications are one of the tools in health promotion to provide more comprehensive access to sexual and reproductive health information, especially for young adolescents (Kadir et al., 2021). In this case, mobile apps have the potential to provide reproductive health education that can be tailored to the audience. Relative reach, continuous availability to users, and flexibility and provision for all groups make mobile apps a popular tool for humans (Chandler et al., 2021). The purpose of this study was to determine the effect of mobile application on reproductive health literacy among adolescent girls with visual impairment in Sukabumi City and Regency.

Materials and Methods

This type of research uses a quasi-experiment with a pre and posttest control group design. The inclusion criteria in this study are adolescents with visual impairments, aged 10 to 18 years, have smartphones with the Android operating system, are able to operate smartphones, and are willing to become respondents. While the exclusion criteria in this study include adolescents with visual sensory disabilities who are deaf, speech impaired, blind, physical and psychological disorders and adolescents who have cognitive impairment. The sampling technique used total sampling with a total sample of 230 people divided into control and intervention groups of 115 people each.

The data collection method used a standardized instrument, namely Sexual Reproductive Health Literacy (SRHL) for sexual reproductive health literacy variables. The instrument was declared valid because it had a p-value <0.05 and a Cronbach alpha value >0.70. The data collection process took place from June 2023 to February 2024. Data analysis was conducted using SPSS software version 26. Statistical analysis used paired sample t-test and independent sample t-test.

Ethical approval for this study was obtained from Sukabumi College of Health Sciences with ethical number No: 00088/KEP STIKES SUKABUMI/2024. Informed consent from all participants was obtained and their confidentiality and anonymity were guaranteed throughout the study. There were no known risks associated with this study and the study was conducted in accordance with ethical guidelines.

Results

Table 1. Characteristics of Respondents (n = 230)

Respondent Characteristics	Intervention Group	Control Group
	n = 115 (%)	n = 115 (%)
Age, Mean \pm SD	16.47 \pm 2.55	16.31 \pm 2.39
Education Level		
In-School	72 (62.61)	63 (54.78)
Out-School	43 (37.39)	52 (45.22)
Religion		
Muslim	94 (81.74)	101 (87.83)
Non-Muslim	21 (18.26)	14 (12.17)
Living With family		
Yes	88 (76.52)	91 (79.13)
No	27 (23.48)	24 (20.87)
Source of Information		
Internet	78 (67.83)	73 (63.48)
Friend	28 (20.87)	28 (24.35)
Teacher or Others	13 (11.30)	14 (12.17)

Based on table 1, it can be seen the average age of the respondents in intervention group was 16.47 with a standard deviation of 2.55, most of the respondents were in-school, namely 72 people (62.61%), muslim, namely 94 people (81.74%), live with family, namely 88 people (76.52%), get the information from internet, namely 78 people (67.83%). Meanwhile in the control group the average age of the respondents in intervention group was 16.31 with a standard deviation of 2.39, most of the respondents were in-school, namely 63 people (54.78%), muslim, namely 101 people (87.83%), live with family, namely 91 people (79.13%), get the information from internet, namely 73 people (63.48%)

Table 2. Univariate Analysis

Reproductive Health Literacy	Mean	SD	Min	Max
Intervention Group				

Pre-test	43.20	12.35	16	67
Post-test	73.62	5.93	62	84
Control Group				
Pre-test	43.14	12.15	16	67
Post-test	48.19	14.91	22	82

Based on table 2 shows that in the intervention group results of reproductive health literacy pre-test is 43.20, minimum value is 16, maximum value is 67 with standar deviation of 12.35 and post-test is 73.61, minimum value is 62, maximum value is 84 with standar deviation of 5.93. Meanwhile in the control group results of reproductive health literacy pre-test is 43.14, minimum value is 16, maximum value is 67 with standar deviation of 12.15 and post-test is 48.19, minimum value is 22, maximum value is 82 with standar deviation of 14.91.

Table 3. Bivariate Analysis

Reproductive Health Literacy	Mean	Mean Difference	SD	t	p-value
Intervention Group					
Pre-test	43.20		12.35		
Post-test	73.62	-30.417	5.93	-23.764	0,000
Control Group					
Pre-test	43.14		12.15		
Post-test	48.19	-5.043	14.91	-2.81	0,006
Reproductive Health Literacy	Mean	Mean Difference	t	p-value	
Intervention Group	30.41				
Control Group	5.04	-25.37	-11.510	0,000	

Table 3 revealed that the reproductive health literacy scores increased significantly in the intervention group (from 43.20 ± 12.35 at pre-test to 73.62 ± 5.93 at post-test) ($p = 0.000$). Meanwhile reproductive health literacy scores increased significantly in the control group (from 43.14 ± 12.15 at pre-test to 48.19 ± 14.91 at post-test) ($p = 0.006$). Furthermore, there was a significant difference between the control and intervention groups on the average reproductive health literacy ($p=0.000$) where the increase in scores in the intervention group was greater than the control group.

Discussion

Pre-test and post-test differences in reproductive health literacy scores in the control group

The results showed that the average reproductive health literacy obtained from 115 respondents in the pre-test measurement was 43.14 meanwhile in the post-test measurement was 48.19. Literacy requires a range of cognitive skills, knowledge of written and spoken language, knowledge of generation planning, and knowledge of culture (Ireland & Maypilama, 2021). Reproductive health literacy is the ability to obtain information related to reproductive health, understand the information, and use the information in making decisions related to reproductive

health (Ninsiima et al., 2021). The control group mostly received information from the internet. Information circulating on the internet helped the control group understand new knowledge related to basic concepts of reproductive health. The smart phones owned by respondents give them access to explore new knowledge related to reproductive health. Smart phones also gradually replace traditional assistive devices such as braille in accessing information through their sense of hearing so that knowledge continues to increase by searching for information via the internet assisted by smart phones (Senjam et al., 2021).

There are various factors that can influence the improvement of reproductive health literacy in adolescents with visual impairment, one of which is the role of the family (Bazakare. et al., 2024). The increase in reproductive health literacy scores in the control group can occur because parents carry out their duties in educating their children by continuing to update reproductive health knowledge by implementing literacy. The results showed that most respondents lived with their parents. Families play a role in introducing body parts and how to care for them to their children either using verbal language or braille book media. Another thing that has an impact on improving reproductive health literacy in the control group is family support. Most of the control group lived with their families. Manitsa's research revealed that individuals with visual impairment will receive more support from their environment, including family. The family support provided makes respondents more valued and accepted and becomes a means of helping to overcome the challenges they face, in this case reproductive health (Manitsa & Doikou, 2022). Families can provide support in the form of information related to reproductive health through advice and experience so that respondents are interested in seeking further information from reproductive health (Usonwu et al., 2021).

Effect of Mobile Application Use on Reproductive Health Literacy in the Intervention Group

The results showed that there was an effect of using mobile applications on reproductive health literacy in the intervention group. Health literacy is defined as an individual's ability to access, understand and use health information and the ability to make decisions about health. An individual's level of health literacy is reflected in health behaviours (Khairunnisa et al., 2023). Low health literacy has a negative impact on both individuals and the healthcare system as a whole. Poor health literacy is often associated with lower well-being and suboptimal self-care, and contributes to increased healthcare costs due to underutilization of preventive services. Furthermore, lack of knowledge and awareness of certain symptoms often leads to delays in seeking care, which in turn leads to poorer health outcomes. Therefore, the provision of easily accessible tools to improve reproductive and menstrual health literacy can help address gaps in current services (Cunningham et al., 2024).

Health education based on smartphone apps offers advantages over other education methods. It can reduce costs and increase access to health information, while improving knowledge and health outcomes. By using apps, adolescents can learn independently and at a pace that suits them, which can increase interest in learning. The use of mobile apps for adolescent health education was shown to significantly improve their knowledge and attitudes related

to reproductive health (Anggela et al., 2022). Digital applications feature various categories of information and education that can improve adolescent literacy, especially regarding reproductive health. The attractive display of adolescent health education materials on digital applications can increase adolescent literacy in recognising reproductive health so as to prevent unexpected events in adolescence. The delivery of information on reproductive health through digital applications is also considered more efficient because adolescents can access the site almost every time and the delivery format is insightful so that individuals are always connected and can provide responses. Therefore, digital applications are effective in disseminating information to young people when compared to face-to-face education that is limited in time and place (Muhlisa et al., 2024).

This mobile application provides information on adolescent reproductive growth and development so that they can understand the body changes that may occur during adolescence. Providing this accurate information can reduce confusion regarding the changes they experience. By getting the right information, adolescents will be better prepared to face their body changes with a positive attitude, which in turn can prevent them from risky behaviors such as exploring the changes alone or with the opposite sex (Anggela et al., 2022). Reproductive health knowledge accessed through digital applications has been shown to increase adolescents' productivity in accessing health services such as reducing unproductive travelling time, enabling adolescents to make faster decisions by improving knowledge, skills and attitudes in performing independent health care, and improving effective communication in obtaining information (Otu et al., 2021).

Differences in reproductive health literacy scores in the control and intervention groups

The results showed that there were differences in sexual reproductive health literacy among adolescent girls with visual impairment in the control and intervention groups. Sexual reproductive health literacy in the control and intervention groups both experienced an increase in the average value. However, the difference in the mean value of sexual reproductive health literacy in the intervention group was significantly higher at 30.41 compared to the control group at 5.04. The increase in the mean score of sexual reproductive health literacy in the control group can occur, because most respondents go to school and obtain information sources from the internet. This research is in line with Utami et al. (2024) who revealed that schools emphasize the importance of quality curriculum-based sexual education programs. School-based sex education programmes have been shown to contribute to improving sexual reproductive health literacy and reducing risky sexual behaviours in adolescents, including adolescents with visual impairment. Various school-based sexual and reproductive health education models that have been conducted include education to improve life skills in HIV prevention, peer education, and comprehensive sexuality education. Sex education provides adolescents with an understanding of sexual and reproductive health rights related to knowledge and life skills, which can then be applied to decision-making regarding their sexual behaviour.

Information sources from the internet can also improve sexual and reproductive health literacy in adolescents with visual impairment. Access to online health resources allows these adolescents to obtain health knowledge that

is often tailored to their specific needs. These adolescents can explore topics such as physical, mental, emotional, sexual health, and disease prevention in a way that suits their unique circumstances (Taba et al., 2022). The increase in the mean score of sexual reproductive health literacy in the intervention group can occur, because respondents receive treatment in the form of access to the use of reproductive health literacy mobile applications. This study agrees with Griffin-Shirley et al. (2017) which states that the use of reproductive health literacy mobile application for adolescent girls with visual impairment is key in helping them provide accessible health information. Mobile applications can be conceptualized with attention to the special needs of visually impaired users through the integration of features such as voice commands, screen readers, and audio descriptions. Mobile apps also offer interactive learning opportunities, where users can engage with educational content through audio guidance. Such interactive elements can improve sexual reproductive health literacy, thus enabling adolescents to better understand reproductive health and influencing them to make informed decisions regarding their health. People with visual impairment can perform at a higher level and be more independent when completing daily life activities with the help of apps than without apps. People with visual impairments can use smartphones to take photos of road signs, and then read the signs by zooming in on the images instead of carrying monoculars to identify the street names by sight (Griffin-Shirley et al., 2017).

Conclusion

The results showed that there were differences in pretest and posttest reproductive health literacy among adolescent girls with visual impairment in the control group. The results also show that there is an effect of mobile application on reproductive health literacy among adolescent girls with visual impairment in the intervention group. In addition, the results showed that there was a difference in reproductive health literacy among adolescent girls with visual impairment in the control and intervention groups.

Acknowledgment

The authors would like to thank the Sukabumi College of Health Sciences for their great support and assistance in the process of collecting data for this research.

Amanu, A., Birhanu, Z., & Godesso, A. (2023). Sexual and reproductive health literacy among young people in Sub-Saharan Africa: evidence synthesis and implications. *Global Health Action*, 16(1).

<https://doi.org/10.1080/16549716.2023.2279841>

Anggela, S., Wanda, D., & Agustini, N. (2022). Effectiveness of Mobile Application Effective in Increasing Adolescent's Knowledge and Attitude Related to Reproductive Health. *Malaysian Journal of Medicine and Health Sciences*, 18(5), 115–120.

Bazakare., M. L. I., Rwabufigiri, B. N., & Munyanshongo, C. (2024). *Knowledge and practice toward menstrual*

- hygiene management and associated factors among visual impaired adolescent girls : a case of two selected institutions in Rwanda. 1–15. <https://doi.org/10.1177/26334941241303518>
- Chandler, R., Guillaume, D., Parker, A. G., Carter, S., & Hernandez, N. D. (2021). Promoting Optimal Sexual and Reproductive Health with Mobile Health Tools for Black Women: Combining Technology, Culture and Context. *Perspect Sex Reprod Health*, 52(4), 205–209. <https://doi.org/10.1363/psrh.12170>
- Criollo-C, S., Guerrero-Arias, A., Jaramillo-Alcázar, Á., & Luján-Mora, S. (2021). Mobile Learning Technologies for Education: Benefits and Pending Issues. *Applied Sciences*, 11(9), 4111. <https://doi.org/10.3390/app11094111>
- Cunningham, A. C., Prentice, C., Peven, K., Wickham, A., Bamford, R., Radovic, T., Klepchukova, A., Fomina, M., Cunningham, K., Hill, S., Hantsoo, L., Payne, J., Zhaunova, L., & Ponzo, S. (2024). Efficacy of the Flo App in Improving Health Literacy, Menstrual and General Health, and Well-Being in Women: Pilot Randomized Controlled Trial. *JMIR MHealth and UHealth*, 12, 1–20. <https://doi.org/10.2196/54124>
- Griffin-Shirley, N., Banda, D. R., Ajuwon, P. M., Cheon, J., Lee, J., Park, H. R., & Lyngdoh, S. N. (2017). A Survey on The Use of Mobile Applications for People Who Are Visually Impaired. *Journal of Visual Impairment & Blindness*, 111(4), 307–323. <https://doi.org/https://doi.org/10.1177/0145482X1711100402>.
- Heiba, M. F., Mahmoud, F., Sayed, A. E., & Salah-eldin, H. (2023). Assessment of Knowledge and Hygienic Practices Regarding Menstruation for Visually Impaired Adolescent Girls. *Port Said Scientific Journal of Nursing*, 10(4), 1–24. <https://doi.org/10.21608/pssjn.2023.218325.1271>
- Ireland, S., & Maypilama, E. L. (2021). “We are sacred”: An intercultural and multilingual approach to understanding reproductive health literacy for Yolŋu girls and women in remote Northern Australia. *Health Promotion Journal of Australia*, 32(S1), 192–202. <https://doi.org/10.1002/hpja.439>
- Janighorban, M., Boroumandfar, Z., Pourkazemi, R., & Mostafavi, F. (2022). Barriers to vulnerable adolescent girls’ access to sexual and reproductive health. *BMC Public Health*, 22(1), 1–16. <https://doi.org/10.1186/s12889-022-14687-4>
- Kadir, Y. R., Syarif, S., Arsyad, M. A., Baso, Y. S., & Usman, A. N. (2021). Female’s Reproductive Health Application Design on the School Teacher Knowledge: an Android-Based Learning Media. *International Journal of Health & Medical Sciences*, 4(2), 189–195. <https://doi.org/10.31295/ijhms.v4n2.1686>
- Khairunnisa, Wardiati, & Agustina. (2023). Adolescent Reproductive Health Literacy and Influencing Factors (A Cross-Sectional Study on Students of Madrasah Aliyah Negeri 1 Banda Aceh). *Indonesian Journal of Health Promotion*, 6(6), 1142–1149. <https://doi.org/10.56338/mppki.v6i6.3398>
- Manitsa, I., & Doikou, M. (2022). Social support for students with visual impairments in educational institutions: An integrative literature review. *British Journal of Visual Impairment*, 40(1), 29–47. <https://doi.org/10.1177/0264619620941885>
- Masud, U., Saeed, T., Malaikah, H., Islam, F. U. L., & Abbas, G. (2022). Smart Assistive System for Visually

- Impaired People Obstruction Avoidance Through Object Detection and Classification. *IEEE Access*, 10, 13428–13441. <https://doi.org/10.1109/ACCESS.2022.3146320>
- Muhlisa, Amiruddin, R., Moedjiono, A. I., Suriah, Damanik, R., Salmah, U., Nasir, S., Areni, I. S., & Mallongi, A. (2024). Application-based Reproductive Health Education on Reproductive Health Risk Behavior among Adolescents in Ternate City. *Pharmacognosy Journal*, 16(4), 942–948. <https://doi.org/10.5530/pj.2024.16.152>
- Nahata, L., Anazodo, A., Cherven, B., Logan, S., Meacham, L. R., Meade, C. D., Zarnegar-Lumley, S., & Quinn, G. P. (2020). Optimizing health literacy to facilitate reproductive health decision-making in adolescent and young adults with cancer. *Pediatric Blood & Cancer*, 70(5), 28476. <https://doi.org/10.1002/pbc.28476>
- Ninsiima, L. R., Chiumia, I. K., & Ndejjo, R. (2021). Factors influencing access to and utilisation of youth-friendly sexual and reproductive health services in sub-Saharan Africa: a systematic review. *Reproductive Health*, 18(1), 135. <https://doi.org/10.1186/s12978-021-01183-y>
- Otu, A., Ukpeh, I., Okuzu, O., & Yaya, S. (2021). Leveraging mobile health applications to improve sexual and reproductive health services in Nigeria: implications for practice and policy. *Reproductive Health*, 18(1), 1–5. <https://doi.org/10.1186/s12978-021-01069-z>
- Parida, S. P., Gajjala, A., & Giri, P. P. (2021). Empowering adolescent girls, is sexual and reproductive health education a solution? *Journal of Family Medicine and Primary Care*, 10(1), 66–71. <https://doi.org/10.4103/jfmpe.jfmpe>
- Rogge, A. K., Hamacher, D., Cappagli, G., Kuhne, L., Hötting, K., Zech, A., Gori, M., & Röder, B. (2021). Balance, gait, and navigation performance are related to physical exercise in blind and visually impaired children and adolescents. *Experimental Brain Research*, 239(4), 1111–1123. <https://doi.org/10.1007/s00221-021-06038-3>
- Ryskeldiyeva, K., Moldaliyev, I., Tuktibaeva, S., Nurkhassimova, R., Kurbaniyazova, S., Kushkarova, A., & Ramanova, S. (2023). Knowledge, attitude and practice of adolescent girls towards reproductive health: a cross-sectional study in Turkistan region, Kazakhstan. *Future Science OA*, 9(3). <https://doi.org/10.2144/fsoa-2022-0054>
- Seah, M. L. C., & Koh, K. T. (2020). The efficacy of using mobile applications in changing adolescent girls' physical activity behaviour during weekends. *European Physical Education Review*, 27(1), 1–19. <https://doi.org/10.1177/1356336X20930741>
- Senjam, S. S., Manna, S., & Bascaran, C. (2021). Smartphones-Based Assistive Technology: Accessibility Features and Apps for People with Visual Impairment, and its Usage, Challenges, and Usability Testing. *Clinical Optometry*, 13, 311–322. <https://doi.org/10.2147/OPTO.S336361>
- Taba, M., Allen, T. B., Caldwell, P. H., Skinner, S. R., Kang, M., McCaffery, K., & Scott, K. M. (2022). Adolescents' Self-Efficacy and Digital Health Literacy: A Cross-sectional Mixed Methods Study. *BMC Public Health*, 22(1), 1223. <https://doi.org/https://doi.org/10.1186/s12889-022-13599-7>

- Usonwu, I., Ahmad, R., & Curtis-Tyler, K. (2021). Parent–adolescent communication on adolescent sexual and reproductive health in sub-Saharan Africa: a qualitative review and thematic synthesis. *Reproductive Health*, 18(202). <https://doi.org/10.1186/s12978-021-01246-0>
- Utami, D. R. R. B., Nurwati, I., & Lestari, A. (2024). School-based Sexual and Reproductive Health Education among Adolescents in Developing Countries. *International Journal of Public Health Science*, 13(1), 141–149. <https://doi.org/10.11591/ijphs.v13i1.23267>.
- Wang, C., & Qi, H. (2021). Influencing Factors of Acceptance and Use Behavior of Mobile Health Application Users: Systematic Review. *Healthcare*, 9(3), 357. <https://doi.org/10.3390/healthcare9030357>