

Website-based application development as an alternative media for reproductive health promotion in adolescent



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ABSTRACT

Background: Adolescents' knowledge about reproductive health is not comprehensive—and most adolescents still consider it taboo to discuss reproductive health issues with their parents. Today's adolescents are included in Generation Z; they like to look for alternative sources of information, especially through electronic media, as their social life cannot be separated from electronic media. This condition is the basis for developing a website as an alternative media for promoting adolescent reproductive health.

Methods: This study combined qualitative and quantitative research methods with a type of R&D (Research and Development). To determine the feasibility of the reproductive health website, a validity test was carried out by 1 material expert, 1 media expert, a small group trial of 8 adolescents, and a large group trial of 384 adolescents of 15-18 years with an android mobile.

Results: The results of validation by the material expert with an average validation value of 81.04% ($\geq 61\%$), the media expert with an average validation value of 82.70% ($\geq 61\%$), a small group trial with an average validation value of 85.56% ($\geq 61\%$), and a large group trial with an average validation value of 90.80% ($\geq 61\%$). There are differences in knowledge before and after treatment; namely, reproductive health education was carried out ($p=0.000$).

Conclusion: Product feasibility based on these indicators makes the website one of the media alternatives for conducting adolescent reproductive health education.

Keywords: Website Development, Reproductive Health, Adolescents.

Cite This Article: Wahyuni, S., Sukriani, W. 2023. Website-based application development as an alternative media for reproductive health promotion in adolescent. *Bali Medical Journal* 12(3): 2559-2564. DOI: 10.15562/bmj.v12i3.4638

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Received: 2023-05-09
Accepted: 2023-07-24
Published: 2023-08-28

INTRODUCTION

According to the World Health Organization (WHO), reproductive health is a state of complete physical, mental and social well-being, not only free from disease/disability but also in all matters relating to aspects of reproduction.¹ This should be prepared since adolescence so that the reproductive health conditions are optimal during adulthood. Sexual maturity that begins in adolescence requires adaptation to deal with changes.² Sexual maturity and changes in body shape greatly affect the psychological state of adolescents.³ Besides, another impact of sexual maturity on adolescents is that they start to be interested in the anatomy and physiology of their bodies.⁴

Data from the World Health Organization (WHO) released on December 13th, 2018, state that more than 1.1 million adolescents aged 10-19 years

old died in 2016; among the causes of their death are HIV/AIDS—and the practice of abortion.⁵ The incidence of abortion is closely related to unwanted pregnancies. It is estimated that the number of abortions per year in Indonesia can reach 2.4 million, around 800,000 of which occur among adolescents.⁵ Some causes of pregnancy out of wedlock in adolescents vary widely. Using drugs, intoxicating candy, and glue sniffing sometimes becomes a means of “daring” for adolescents to get certain stimuli in channeling their biological urges. The Yong Adult Reproductive Health Survey results from 2002-2003 show that 6 out of 10 adolescent boys smoke daily and 8% have used drugs. According to the Center for Research and Development, in 2015, 8.26% of adolescent boys and 4.17% of adolescent girls had premarital sex. It is estimated that 20-25% of all HIV/AIDS infections

worldwide occur in adolescents—and the highest incidence of sexually transmitted diseases (STDs) also occurs in adolescents, especially in adolescent girls.⁵

Limited access to information about sexuality and reproductive health for adolescents in Indonesia is one of the reasons for this. Women have less knowledge about sexual development than men. Women are more easily embarrassed, so they tend to limit themselves in obtaining information related to sexual development.⁶ There is a public perception of sexuality as taboo and not worth discussing openly.⁷ There is a very minimal explanation about sexuality from parents and adolescents tend to be embarrassed to ask their parents openly (about sexuality).

Adolescents' knowledge about reproductive health is not comprehensive—and most adolescents still consider it taboo to discuss reproductive health issues

with their parents. Today's adolescents are included in Generation Z; they like to look for alternative sources of information, especially through electronic media, as their social life cannot be separated from electronic media. Thus, to overcome the problem explained, we need an alternative media promotion of reproductive health.⁸ Reproductive health promotion media that is more attractive to teenagers today is website-based to broaden and deepen adolescents' knowledge about reproductive health.^{8,9}

Based on those mentioned above, this study aims to develop a website-based application as an alternative media for promoting adolescent reproductive health.

METHODS

This study used mixed methods, namely combining qualitative and quantitative research methods with a type of R&D (Research and Development) to produce a product as a reproductive health website for adolescents. Creating a reproductive health website was carried out through 9 stages, including analyzing potential problems, designing the website, validating the design by a material expert and a media expert, revising the website, testing the website in a small group, revising the website, testing the website in a large group, and revising the website.¹⁰ The validator from material expert in this study was 1 person and from media expert was 1 person. The number of adolescents involved in the small group was 8 adolescents and in the large group was 384 adolescents. The inclusion criteria were adolescents aged 15-18 with an Android mobile. The exclusion criteria for research respondents were adolescents who refused to be research respondents. Respondents were selected by purposive sampling. The data analysis used consisted of quantitative analysis obtained from the expert validation questionnaires and the feasibility tests on the small and large groups of adolescents. Meanwhile, qualitative analysis was obtained from suggestions and input provided by the material expert, the media expert, and adolescents for website improvement. This study has been approved by the Ethics Committee of Poltekkes Kemenkes Palangka Raya with No.135/IV/

KE.PE/2023 dated 11 April 2023 and paid attention to the principles of the research process.

RESULTS

This website was developed through several stages of development consisting of analysis of potential problems, data collection, product design, design validation, first product trial, design revision, second product trial, design revision, and product revision.

Analysis of Potential Problems

Limited and incomprehensive knowledge of adolescents about reproductive health has the potential to lead to unexpected behavior and cause problems in reproductive health. Adolescents' knowledge about Puberty, Dysmenorrhoe, Sexually Transmitted Infections (STIs), HIV/AIDS, and Drugs yields a poor knowledge score with an average of 42.71 ± 3.3 . This stage was carried out because there is a phenomenon in adolescents who do not have comprehensive knowledge about adolescent reproductive health, which has the potential to lead to unexpected behavior that can cause reproductive health problems in adolescents. Adolescents selected as respondents were 15-18 years old because they belong to the adolescent group during the middle adolescence stage, which was the stage of adolescence suitable for in-depth health education.¹¹ The middle adolescence stage, according to Monks et al., is a period of adolescence with a view of life, realizing their own identity, and participating in culture.¹² The instrument used in this study was a questionnaire containing knowledge about reproductive health and the need for educational media in health promotion. Several things were found, among others, that adolescents' knowledge about reproductive health is not comprehensive—and most adolescents still consider it taboo to discuss reproductive health issues with their parents. Today's adolescents are included in Generation Z; they like to look for alternative sources of information, especially through electronic media, as their social life cannot be separated from electronic media.¹³ This underlies researchers to develop an adolescent reproductive

health website as an alternative media for promoting adolescent reproductive health. The ease of obtaining information via the internet is a product of information and communication technology that dominates today.¹⁴ Online education by maximizing the benefits of the worldwide website (www) technology is important in developing a faster educational process.¹⁵

Adolescent Reproductive Health Website Design

In design planning, the data collection results were used as a benchmark. This stage resulted in stages which included designing a website for adolescent reproductive health (planning the form of material on the website, digital quizzes, educational videos on adolescent reproductive health, consultation columns), digital adolescent reproductive health education, website layout planning, and menu buttons layout planning on the website. The next stage was the product development stage, which included developing a digital learning website layout design, compiling digital material sequences, and making menu buttons on the website (**Figure 1-4**).

A reproductive health website as an alternative to promoting reproductive health is made with an attractive design and communicative language according to the characteristics of adolescents. Website media can increase adolescents' knowledge, as evidenced by an increase in comprehensive knowledge of adolescents concerning adolescent reproductive health. The reproductive health website promotes adolescent reproductive health regarding Recognizing Male and Female Reproductive Organs, Puberty, Dysmenorrhoe, Sexually Transmitted Infections (STIs), HIV/AIDS, and Drugs. , the website is also equipped with animated videos, quizzes, and free consultation services for adolescents—which are guided directly by specialist doctors, general practitioners, and midwives.

Website Design Validation

Material Expert Validation on Adolescent Reproductive Health Website

This validation was carried out to obtain data on the feasibility of website-based adolescent reproductive health media. Material expert validation aims to receive

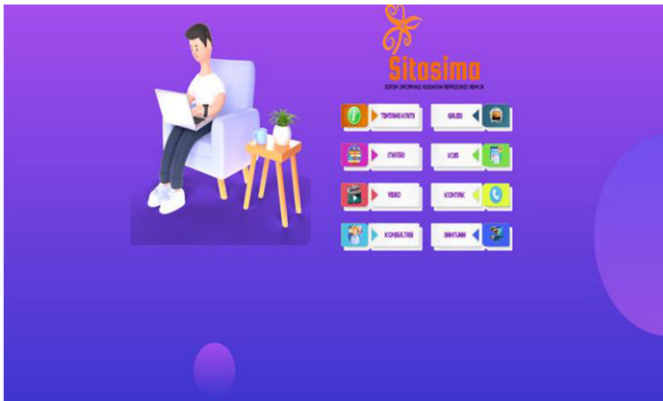


Figure 1. Website Home Page



Figure 3. Adolescent Reproductive Health Quizzes



Figure 4. Consultation Column



Figure 2. Adolescent Reproductive Health Materials

information, criticism, and suggestions so that the media developed becomes a quality product in terms of the aspects of reproductive health education materials in the promotion of reproductive health and the benefits of material substance. The material expert assessment questionnaire consisted of 16 questions. Each statement was assessed with the lowest score of 1 and the highest score of 4.

The Media expert assessed the appearance (display) of the application (website) as a medium for promoting reproductive health in adolescents and evaluated the feasibility of the application. There are 4 aspects that are used as indicators in assessing the appearance and feasibility of a website, namely aspects of website appearance, website operation, visual communication, and usability. The media expert assessment questionnaire consisted of 18 questions. Each statement was assessed with the lowest score of 1 and the highest score of 4.

Studies suggest that the number of expert validators for material and media aspects is more than one person

Table 1. Material Expert Validation Results

Assessment Aspects	Score obtained	Maximum Score	Percentage score (%)	Information
Material Quality	11	12	91.67	Very feasible
Material Accuracy	18	24	75.00	Feasible
Relevance	7	8	87.50	Very feasible
Benefits	14	20	70.00	Feasible
Average validation value			81.04	Valid

to obtain more suggestions and input for improving teaching materials. The adolescent reproductive health website is SITASIMA (Adolescent Reproductive Health Education Information System). This validation test was carried out by 2 experts. The first validator is dr. Muhammad Fitriyanto Leksono, MSi, is a reproductive health expert. He is a Population and Family Planning Administrator, Chairman of PKBI Central Kalimantan, and a Non-Permanent Lecturer at Poltekkes Kemenkes Palangka Raya. The second validator is Sam'ani, ST, M.Kom, who is a lecturer from STIKOM with a Master's Degree in Computer background. Based on the results of the

qualitative media validity test, according to the first validator, the things that needed to be considered were that the website name should be made more attractive, the material should be made more systematic, the menu should be improved to make it simpler, the language used was easy to understand—and for connectivity, the website could be integrated with other applications. In addition, there was also a suggestion (an input) to complete the website with an online consultation column for adolescents to make it more useful. The resulting score from the expert material validation is 84.38%, with a very good category. The calculation results can be seen in the following Table 1. The

average validation of the reproductive health website design by the material expert is 81.04% and is declared valid because $\geq 61\%$

As a media expert, the second validator provided input, especially on the media side in general. According to the second validator, the things that needed to be considered were that the appearance (display) of the page should be made more attractive, the color combination and font size in the title should be made more proportional and attractive and stronger colors. Furthermore, logos and images should also be made more attractive. The navigation buttons and menus on the homepage should be more attractive. The language used was easy to understand. The resulting score from the media expert validation is 82.70% and is declared valid because $\geq 61\%$. The calculation results can be seen in the following [Table 2](#).

Revision of the Adolescent Reproductive Health Website

Based on input from the material and media experts, the design revision stage has been carried out. The input from the material expert was that the website name should be made more attractive, the material should be made more systematic, the menu should be improved to make it simpler, and the language used was easy to understand—and for connectivity, the website could be integrated with other applications. In addition, the website should also be completed with an online consultation column for adolescents to make it more useful. Meanwhile, the media expert's input was that the page's appearance (display) should be made more attractive; the color combination and font size in the title should be made more proportional and use attractive and stronger colors. Furthermore, logos and images should also be made more attractive. The arrangement of navigation buttons and menus on the homepage should be made more attractive. The language used was easy to understand.

Testing the Website in a Small Group

After the revision process was carried out based on input from the material and media experts, the next stage was the product trial. The first product trial

Table 2. Media Expert Validation Results

Assessment Aspects	Score obtained	Maximum Score	Percentage score (%)	Information
Website display	16	20	80	Feasible
Website operation	15	20	80	Feasible
Grammar	20	24	83.33	Very feasible
Benefits	7	8	87.5	Very feasible
Average validation value			82.70	Valid

Table 3. Validation Results in a Small Group

Assessment Aspects	Percentage score (%)	Information
Material Quality	86	Very feasible
Grammar	84.90	Very feasible
Website operation	84.38	Very feasible
Benefits	87	Very feasible
Average validation value	85.56	Valid

Table 4. Validation Results in a Large Group

Assessment Aspects	Percentage score (%)	Information
Material Quality	90.08	Very feasible
Grammar	90.56	Very feasible
Website operation	89.69	Very feasible
Benefits	92.09	Very feasible
Average validation value	90.60	Valid

was conducted on 8 people of small-scale respondents. This small group trial was used to determine feasibility and find out opinions/obtain inputs from users about the website developed. The small group pilot trial questionnaire consisted of 20 statements assessed using a Likert scale. The lowest score was obtained from the strongly disagree statement, namely 1. The highest score was obtained from the strongly agreed statement, namely 4. The assessment and analysis aspects of student response scores are as follows ([Table 3](#)):

Revision of the Adolescent Reproductive Health Website

The results of the small group trial in the form of suggestions and input from adolescent participants were used as guidance in revising the website. Based on the trial results, the adolescent reproductive health website obtains an average score of 85.56% and is declared valid. Several suggestions from respondents included button layouts, colors and font types should be made more attractive.

Testing the Website in a Large Group

The second product trial was carried out

on large-scale respondents, namely 384 people. The results of testing the use of the website in a large group are as follows ([Table 4](#)):

Based on [Table 4](#), there is an increase between the first and second trials in terms of the quality of the adolescent reproductive health website media. This can be proven from the assessment scores of adolescents who participated in the trials using the reproductive health website.

Based on [Table 5](#), the result of the validity test of adolescent knowledge about reproductive health is all valid statements, and based on [Table 6](#), the result of the reliability test of adolescent knowledge about reproductive health obtained *Cronbach's Alpha* value of $> 0,6$, which is equal to 0,741 meaning that the reliability test results were declared reliable.

Based on [Table 7](#), the pretest and posttest results of adolescent knowledge about reproductive health obtained an average pretest score of 42.86, which increased to 71.00 in the posttest after treatment. The p-value is 0.000 ($p < 0.05$), meaning there is a significant difference before and after the educational treatment using the reproductive health website.

Table 5. Validity test result of adolescent knowledge

No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected item-total correlation	Cronbach's Alpha if Item deleted
Q1	5.30	3.390	0.444	0.714
Q2	5.43	3.289	0.358	0.730
Q3	5.37	2.930	0.703	0.662
Q4	5.50	3.224	0.360	0.731
Q5	5.33	3.264	0.487	0.706
Q6	5.43	3.220	0.404	0.721
Q7	5.40	3.352	0.342	0.732
Q8	5.40	3.214	0.438	0.714

Table 6. The reliability test result of adolescent knowledge

Cronbach's Alpha	Total (N=8)
0.741	8

Table 7. Pretest and posttest results of knowledge of adolescents through the Reproductive Health Website

Comparison	Pretest	Posttest
Max score	48.57	80.00
Min score	37.14	50.00
Average score	42.86	71
Standard Deviation	3.30	4.34
P	0.000*	

*Statistically significant if p-value less than 0.05

Product Revision

Based on the product feasibility assessment results in the form of a reproductive health website, the website is declared very feasible. In this final product revision, not much has changed. Changes were made to improve the website: the number of color combinations was made more attractive, the font size was enlarged, and the number of questions on the quiz was increased.

DISCUSSION

The results show that the material quality level is 90.08%, grammar is 90.56%, website operation is 89.69%, and usefulness is 92.09% for the website as a media promotion of reproductive health in adolescents. This indicates that the feasibility level of the website is in the very feasible category. Moreover, the validation test is 90.60%, so the website developed is declared valid. The material and grammar are arranged systematically and are

interesting and easy to understand, thus encouraging adolescents to open and read reproductive health material on the website. Therefore, the existence of this website is expected to increase knowledge and comprehensively change adolescents' attitudes and behavior. The ease of operating the website and the benefits obtained motivate adolescents to study material on the website.

Educational activities using and utilizing technology, especially through websites (online media), can increase adolescent knowledge related to reproductive health.¹⁶ Knowledge of respondents about reproductive health and its related diseases has increased. Furthermore, respondents' attitudes toward diseases and pre-marriage screening have also increased.¹⁷ With increasing knowledge, it will affect the attitudes of adolescents toward risky sexual behavior.¹⁸ If the attitudes toward risky sexual behavior are good, it is hoped that adolescents will be

more responsible for their reproductive health.¹⁹ The material presented (on the website) is very diverse, with interesting pictures so that adolescents have many opportunities to choose the material they like.²⁰ Reproductive health education in the form of a website is easy to access and does not require special storage space, so adolescents can study anywhere and anytime.²¹⁻²⁴ The limitation of this research is that the network is unstable, preventing adolescents from accessing the websites that have been made.

CONCLUSION

Based on the feasibility test, the reproductive health website has met the feasibility requirements. Based on these results, it is recommended that further studies are recommended to develop promotional media for adolescent reproductive health that are more diverse and in line with the times in the hope that adolescents' knowledge and attitudes will be more comprehensive.

CONFLICT OF INTERESTS

All the authors declare that they have no conflict of interest.

ETHICAL CLEARANCE

This study has been approved by the Ethics Committee of Poltekkes Kemenkes Palangka Raya with No.135/IV/KE.PE/2023 dated 11 April 2023. This study paid attention to the principles of the research process. Furthermore, this study has obtained a Research permit from the Regional Development Planning Agency for Research and Development (BAPEDDALITBANG) of Central Kalimantan with No. 072/0296/I/Bapplitbang.

FUNDING

This study was funded by DIPA Poltekkes Kemenkes Palangka Raya in 2023.

AUTHOR'S CONTRIBUTION

Seri Wahyuni and Wahidah Sukriani conceived, wrote and revised this study.

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