

Original Article

Effect of E-WoHealth on Perceived Body Image, Self Confidence, and Body Mass Index (BMI) among Female Adolescents

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ABSTRACT

Low acceptance of body image can lead to behavioral changes and disorders such as depression, excessive desire to lose weight and dieting, eating disorders, as well as low self-esteem. This study aims to analyze the effect of using E-WoHealth on perceived body image, self-confidence, and Body Mass Index (BMI) among female adolescents. This study has obtained ethical approval issued by the Faculty of Public Health, Hasanuddin University No.105/UN4.14.1/YP.01.02/2023 3.01.2023. This was a Quasi-Experimental quantitative study with the R&D (Research and Development) approach and two-group Pre-test-Post-test design. The current study was conducted at State SHS 4 of Palopo City from February 20 to March 30, 2023. A sample size consisted of 108 students, who were selected through a total sampling technique and were assigned into 2 groups, namely the intervention group and the control group consisted of 54 respondents, respectively. The study design developed and validated learning media called Education Woman Health, later abbreviated as E-WoHealth, as a website containing animated videos, text videos and e-booklets to be applied as educational media. The study findings indicated a significant increase in the post-test perceptions of respondents with a p-value of 0.000 <0.05, which means there are differences in perceptions of female adolescents after being given education using E-WoHealth. Furthermore, there was a significant difference between the intervention group and the control group with a p-value 0.000 <0.05. It can be concluded that there was an effect of using web-based E-WoHealth on perceived body image, self-confidence and body mass index among female adolescents. Animated videos and e-booklets can be used as alternative educational medium to increase adolescents' perceptions for self-assessment to create self-confidence and a positive body image.

Keywords: *E-WoHealth, Perception, Body Image, Self-Confidence, Body Mass Index (BMI).*

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INTRODUCTION

During early adolescence, a period of physical development, changes in the body

shape becomes a concern of individuals¹. Body image is a subjective assessment based on self-

perception of physical shape. Female adolescents who are dissatisfied with their physical appearance may take various steps to shape it as desired so as to increase their self-confidence and self-esteem². Such action can affect general health, well-being, body image, and other characteristics in adulthood². Low acceptance of body image or so called body image dysfunction can also cause reproductive health problems, namely irregular menstruation, abnormal weight, anemia and CED in the future³.

Low acceptance of body image can lead to behavioral changes and disorders such as depression, excessive desire to lose weight, eating disorders, and low self-esteem⁴. Threats such as Chronic Energy Deficiency and anemia during pregnancy have the potential to occur if adolescents still think that being thin and small is a beautiful and ideal. Consequently, pregnant women with CED have the opportunity to give birth to children with low birth weight (LBW), while anemia can contribute to Maternal Mortality Rate since they are prone to bleeding during childbirth. Nutritional status must be considered to ensure the optimal growth and development of the future life of adolescents⁵. The incidence of anemia during adolescence is very closely related to the incidence of anemia during pregnancy⁶.

One of the important aspects in the development of personality in female adolescents is having a positive body image and self-confidence. The importance of self-confidence can provide positive encouragement for adolescents. Adolescents who have the attitude of being able to accept their body as it is will show their confidence. A previous study revealed that 25% of adolescents had a moderate level of self-esteem and 75% of adolescents had a low level of self-esteem⁷. Furthermore, a study conducted by Tehzeeb, et al., 2021 proved that the role of culture on the development of eating patterns, physical activity, and socialization with the surrounding environment⁸.

Adolescents who had an ideal body mass index or overweight with a positive body image tended to be more confident, were able to accept their body type and avoid deviant behavior. In contrast, adolescents with a negative body image with overweight or underweight body mass index tended to have a poor diet, often ate fast food, and lacked of exercise⁹. Based on another previous study, it

was found that 23.3% of high school students aged 13-16 years were involved in poor dietary practices¹⁰. Another study conducted by Joanna Sadowska, et al., 2020 showed that adolescents with a low body mass index often felt dissatisfied¹¹.

Efforts made by the government regarding the prevention of underweight and overweight among adolescents have been running but have not obtained good outcomes, causing the high incidence of underweight and overweight among female adolescents. Therefore, the researcher designed a learning media in the form of Education Woman Health which was then abbreviated as E-WoHealth¹²⁻¹³. E-WoHealth is an electronic learning medium which involves e-booklets and animated videos. Such website can be accessed by students to obtain information about body image, self confidence, and Body Mass Index. It is in line with a study conducted by Zhonggen Yu, et al., which found that video and its duration had a significant effect on the perceptions and abilities of female students due to its strong function¹⁴. This study aims to analyze the effect of web-based E-Health on perceived body image, self-confidence and body mass index (BMI) among female adolescents.

METHOD

This study applied the Combined Method namely Research and Development (R&D) developed by Borg and Gall as well as a Quasi Experimental method with a two group Pretest-Posttest design, which involved 108 respondents of students at State SHS 4 of Palopo City. This study was conducted at State SHS 4 of Palopo City. The study design developed and validated learning media called Education Woman Health, later abbreviated as E-WoHealth with several stages namely analysis of learning media needs, development of learning media design, expert test validation, TAM test and test for the final product of learning media. Development stage was initiated with analysis on the needs of female students at State SHS 4 of Palopo City, which was used as a basis for initial product development. At the initial development stage, the researcher conducted an initial study to assess students' perceptions towards the material contained in E-WoHealth, namely body image, self-confidence and Body Mass

Index (BMI). Based on these results, the researcher compiled materials to be involved on the Web. In the next stage, the product was developed by conducting preliminary study on knowledge. After the web product containing videos and e-booklets (E-WoHealth) was completed, a validation and revision tests were performed by involving 2 media or IT experts on November 30, 2022 as well as 2 material experts namely nutritionist and psychologist on December 7, 2022. After the E-WoHealth website was validated and revised, the next step was to conduct a one-on-one trial involving 2 Master of Obstetrics students to assess several things that still need to be improved, including the language of instructions and writing errors on January 25, 2023. Afterwards, small group trial involving 10 female students were conducted on January 26, 2023 as well as large group trial on January 27, 2023 by using almost the same characteristics.

The control group was observed to determine the effectiveness of using web-based E-WoHealth on the increase in perceived body image and Body Mass Index (BMI) among female adolescents. The control group in the study was given an intervention using a web-based E-WoHealth with the contents in the form of an e-booklet and text video regarding body image, self-confidence and Body Mass Index (BMI). On the other hand, the experimental group was given an intervention using a web-based E-WoHealth with the contents in the form

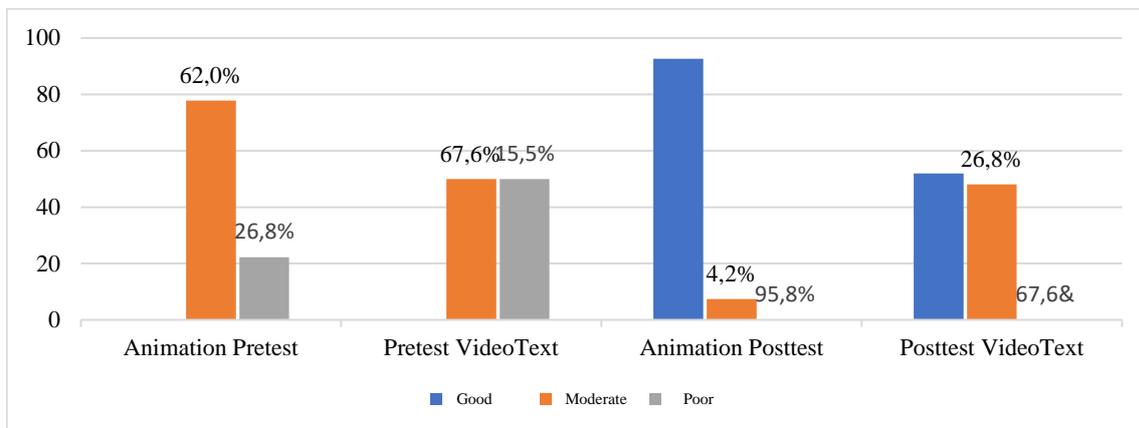
of e-booklets and animated videos regarding body image, self-confidence and Body Mass Index (BMI). The outcomes were further assessed using a questionnaire.

The next steps was to conduct research on February 20 – March 30, 2023. The initial stages of this study involved explanation of the objectives and steps during the study process and asking for approval. If the respondent agreed to be a study sample, informed consent was delivered to be filled in and an account was created to access the web. Furthermore, the researcher provided an explanation regarding the material contained in E-WoHealth and how to use it to make it easier for students in the process of learning material on the web. User name and password were further shared through the WhatsApp Group, and the respondents were asked to fill out the pre-test questionnaire before studying the material on the web. The study lasted for 8 meetings, respondents were given 2x a week to open the web to study the material contained in E-WoHealth. Monitoring was performed through the WhatsApp group and E-WoHealth. After studying education for 4 weeks, the respondents were asked to fill out the post-test questionnaire. After that, the post-test final assessment was carried out. The effect of E-WoHealth was accurately known by comparing the assessment results between before and after being given E-WoHealth based on the per-test and post-test questionnaires.

RESULTS

Table 1. Perceptions Before and After Health Education Using E-WoHealth.

Variable	Pre-Test				Post-Test			
	Intervention		Control		Intervention		Control	
	n	%	n	%	n	%	n	%
Perception								
Good	0	0	0	0	50	92.6	28	51.9
Moderate	42	77.8	27	50.0	4	7.4	26	48.1
Poor	12	22.2	27	50.0	0	0	0	0
Total	54	100	54	100	54	100	54	100



Graph 1. Perceptions Before and After Health Education Using E-WoHealth

Based on the table and graph above, a total sample of 108 people was assigned into 2 groups, namely the intervention group and the control group consisted of 54 respondents, respectively. The intervention group got health education using the E-Wohealth video animation and the control group got health education using E-Wohealth text video. During the pre-test, most of respondents both in the intervention group and the control group were involved in the moderate category by 42 respondents (77.8%) and 27 respondents (50.0%), respectively. Based on the results of the pre-test, it was shown that respondents had moderate level of perception.

After giving the intervention in the form of E-WoHealth video animation and text video, there were changes in perception,

especially in the intervention group of video animation, wherein 50 respondents (92.6%) were involved in the good category, and the remaining 4 respondents (7.4%) were involved in the moderate category. In contrast in the control group of text video, 21 respondents (51.9%) were involved in the good category, and the remaining 26 respondents (48.1%) were involved in the moderate change of perception.

Bivariate analysis was conducted to determine the effect of the independent on dependent variable of changes in perceived body image, self-confidence and Body Mass Index (BMI) of female adolescents. In general, the use of E-WoHealth could affect perceived body image, self-confidence and Body Mass Index (BMI) of female adolescents.

Table 2. Effect of E-WoHealth on Perceived Body Image, Self Confidence and Body Mass Index (BMI).

Variable	N	Negative Rank	Positive Rank	Ties	Sig.
Animated Video Intervention	54	0	54	0	0.000
Pre-Test-Post-Test					
Text Video Intervention	54	0	51	3	0.000
Pre-Test-Post-Test					

*Wilcoxon Test

The table above revealed that of 54 samples in the animated video group, all (100%) respondents experienced positive changes, and no respondent experienced negative changes in perception. Meanwhile in the control group of text video, there were 51 (94.4%) respondents who experienced positive changes in perception and

3 respondents (5.5%) experienced no changes. In general, providing animated videos could influence perceived body image and body mass index of female adolescents.

DISCUSSION

Malnutrition among adolescents is no less

important than obesity and underweight at the age of 16-19 years¹⁵. Interviews conducted with several students revealed that many of them did not know the ideal Body Mass Index, and those who thought that their bodies were not in the ideal category would do various ways to look ideal according to their version. They did various ways, namely diet by reducing their portions at meals. Such finding is reinforced by a study conducted by Ilmi, et al (2021) that one of the nutritional problems in Indonesia was underweight. Female adolescents are involved in the group that is vulnerable to underweight, especially those who live far from their parents. In addition, obesity is also a nutritional problem influenced by fast food consumption which is significantly associated with various emotional and behavioral problems which include somatic symptoms, attention problems, and aggressive behavior among adolescents with overweight problems¹⁶. Many celebrities become role models among adolescents. In fact, many people believe that beautiful people are those who are slim, have white skin, beautiful hair and other physical beauties. In order to get it, adolescents are willing to go on a strict diet without sufficient knowledge of nutrition, resulting in poor eating behavior that is not in accordance with nutritional principles. If such condition is continued, it will affect the health and nutritional quality of adolescents who should be prepared carefully as prospective mothers¹⁷. Adolescent concern for their bodies is also one of the causes of poor intake of nutrients. The results pre-test showed that most of respondents both in the intervention group and the control group were involved in the moderate category by 42 respondents (77.8%) and 27 respondents (50.0%), respectively. Based on the results of the pre-test, it was shown that respondents had moderate level of perception.

During the transition period, female adolescents become more sensitive and always feel dissatisfied with their appearance. So, they pay special attention to their physical appearance¹⁸. Negative body image is very common among adolescence and certainly has negative impacts on health such as increased risk of low self-esteem, depression, impaired physical activity and eating patterns. Preventive effort for the emergence of a negative body image among adolescents can be performed through education about the harmful effects of

unhealthy weight control, and management of healthy weight gain using the appropriate principles of nutrition, diet and physical activity¹⁹. Nutrition education is one of the interventions that can be done to overcome such problems²⁰.

After conducting intervention using video animation, 50 students in the intervention group experienced positive changes, and 4 respondents experienced no changes in perception. On the other hand, 28 respondents in the text video group experienced positive changes in perception and 26 respondents experienced no changes in perception. The results of Wilcoxon test found a p value of $0.000 < 0.05$, meaning that H_0 was accepted. Such finding indicated a change in perception before and after the intervention. Such finding is in line with previous study conducted by Asmawati, et al. which found that counseling using video media had a significant effect on students' knowledge and attitudes regarding anemia with p values for knowledge and attitude of 0.000 ($p < 0.05$) and 0.001 ($p > 0.05$), respectively. It can be concluded that there was an effect of education using video media on perceptions and knowledge on anemia among female adolescents at State JHS 1 of Turikale in 2020.

CONCLUSION

Based on the study findings, it can be concluded that there was an effect of using web-based E-WoHealth on perceived body image, self-confidence and body mass index among female adolescents.

Web-based e-Wohealth, which includes animated videos and e-booklets, can be used as an alternative educational medium in an effort to prevent health problems among adolescents, especially balanced nutrition, good body mass index (BMI), as well as improving their habit or behavior in assessing themselves to not compare themselves with other people so as to create self-confidence or a positive body image.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Komang N, Sasmita A, Made N, Wilani A. Pengaruh citra tubuh terhadap penyesuaian diri pada remaja awal di SMPN 1 Denpasar. *psikologi*. 2019;12–21.
2. Agustina et all. Hubungan Body Image Dengan Harga Diri Pada Remaja Putri Usia 16-18 Tahun. *Ilmu Kesehatan*. 2020;8(2):1–7.
3. Meiriza W, Satria O. Hubungan Berat Badan Tidak Normal Dengan Kejadian Amenore Pada Remaja Putri. *J Kesehatan Perintis*. 2017;4(2):102–8.
4. Eisenberg ME, Ward E, Linde JA, Gollust SE, Neumark-Sztainer D. Exposure to teasing on popular television shows and associations with adolescent body satisfaction. *J Psychosom Res* [Internet]. 2017;103(May):15–21. Available from: <http://dx.doi.org/10.1016/j.jpsychores.2017.09.014>
5. Indrasari OR, Sutikno E. Faktor Yang Mempengaruhi Status Gizi Remaja Usia 16-18 Tahun. *J Kesehatan Indones*. 2022;X(3):128–32.
6. Danefi T, Agustini F. Hubungan Status Gizi Dan Pola Menstruasi Dengan Kejadian Anemia Pada Remaja Di Sman 2 Singaparna Kecamatan Singaparna Kabupaten Tasikmalaya Tahun 208. *J Kesehatan Bidkesmas Respati*. 2018;1(1):9–18.
7. Ifdil, Denich Unzilla A, Asmidir I. Hubungan Body Image dengan Kepercayaan Diri Remaja Putri. 2017;2(3):107–13.
8. Zulfiqar T, Strazdins L, Banwell C. How to Fit In? Acculturation and Risk of Overweight and Obesity. Experiences of Australian Immigrant Mothers From South Asia and Their 8- to 11-Year-Old Children. *SAGE Open*. 2021;11(3).
9. Mutmainnah, Aunurrahman, Warneri. Efektivitas Penggunaan E-Modul Terhadap Hasil Belajar Kognitif Pada Materi Sistem Pencernaan Manusia di Madrasah Tsanawiyah. *J basicedu*. 2021;5(3):1625–31.
10. Abu-baker NN, Eyadat AM, Khamaiseh AM. Heliyon The impact of nutrition education on knowledge , attitude , and practice regarding iron deficiency anemia among female adolescent students in Jordan. *Heliyon*. 2021;7(December 2020):e06348.
11. Sadowska J, Dziaduch I, Brzuskowska M, Ziółkowska K. BMI, Body Perception, and Approach to Eating and Diet in Adolescent Girls. *SAGE Open*. 2020;10(4).
12. Tubuh C, Image B, Penatalaksanaan DAN, Gultom L, Saragih HS, Bangun S. Penyuluhan Pada Remaja Tentang Gizi , Harga Diri (Self Pengukuran Imt Pada Remaj Putri Di Panti Asuha Simpang Tiga Kecamatan Medan Barat Tahun 2020 Abstrak “ Kontribusi Perguruan Tinggi Dalam Pemberdayaan Masyarakat di Masa Pandemi ” “ Kontribusi Perguru. 2020;(November):23–5.
13. Febrina T, Astriani MM. Pengembangan Modul Elektronik Matematika Berbasis Web. *J Kaji Pendidik Mat*. 2020;6(1):27–36.
14. Yu Z, Gao M. Effects of Video Length on a Flipped English Classroom. *SAGE Open*. 2022;12(1).
15. Kemenkes RI. Injeksi 2018 [Internet]. Health Statistics. 2019. 207 p. Available from: <https://www.kemkes.go.id/downloads/resources/download/pusdatin/profil-kesehatan-indonesia/profil-kesehatan-indonesia-2018.pdf>
16. Ishak Z, Fin LS, Wan Ibrahim WAH, Md. Zain F, Yahya A, Selamat R, et al. Fast Food Intake, Emotional and Behavioral Problems among Adolescents with Overweight and Obese Problems Participating in MyBFF@school Intervention Program. *SAGE Open*. 2022;12(1).
17. Setyawati VAV, Herlambang BA. Model Edukasi Gizi Berbasis E-booklet untuk Meningkatkan Pengetahuan Gizi Ibu Balita. *J Inform Upgris* [Internet]. 2015;1(1 Juni):86–94. Available from: <http://journal.upgris.ac.id/index.php/JIU/article/view/810>
18. Wati CR, Lidiawati M, Bintoro Y. Hubungan Indeks Massa Tubuh Dengan Body Image Pada Remaja Putri Kelas I

- Dan Kelas II SMAN 4 Banda Aceh. Pros
Semin Nas Multi Disiplin Ilmu
UNAYA). 2019;3(1):849–57.
19. Ilmi VYA, Maharani N, Dieny FF,
Fitranti DY. Asupan protein, zink, dan
defisiensi zink pada santriwati
underweight. *J Gizi Klin Indones.*
2021;18(2):69.
 20. Nurul Azzahra Putri SA. Pengaruh
Pendidikan Gizi dengan Video Animasi
Terhadap Persepsi Body Image Remaja
di SMK Al-Muhadjirin 2 Kesehatan
Bekasi Timur Tahun 2022. *J Pendidik
dan Konseling [Internet].* 2022;4(4):79.
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