



## Development of health education model (vaginal hygiene) in vaginal candidiasis prevention in pregnant women<sup>☆</sup>



Asriana Abdullah<sup>a,\*</sup>, Nurhaedar Jafar<sup>b</sup>, Muhammad Syafar<sup>c</sup>

<sup>a</sup> Public Health, Hasanuddin University, Indonesia

<sup>b</sup> Nutrition Department, Public Health, Hasanuddin University, Indonesia

<sup>c</sup> Science Behavior and Health Promotion Department, Public Health, Hasanuddin University, Indonesia

Received 2 October 2019; accepted 17 October 2019

### KEYWORDS

VVC;  
Prevention;  
Audio-visual;  
Modules;  
Pregnant women

### Abstract

**Objective:** The danger of VVC for pregnant women are: premature birth, premature rupture of the membranes, low birth weight. In America, 75% of women during reproduction have experienced VVC. Between 40–50% have recurrent infections and 5–8% have chronic candida infections. The purpose of this study is to obtain more comprehensive information regarding the development of models of health education (vaginal hygiene) in the prevention of vaginal candidiasis in pregnant women.

**Methods:** The design used is Literature review. Articles were collected through Cochrane, Science Direct, Pubmed, Elsevier, Proquest (Links are from the library of unhas.ac.id) Pubmed, WHO, CDC, Google Scholar. The keywords used were VVC, prevention, audio-visual, modules, pregnant women. After collecting the article then article synthesis was made.

**Results:** Based on the articles collected, the result shows the lack of development of the health education model, namely the provision of modules and audio-visuals in the prevention of early VVC in pregnant women. Thus, through the provision of health education in the form of audio-visual and modules needed in the prevention of vaginal discharge of VVC in pregnant women.

**Conclusion:** The development of models of health education (vaginal hygiene) can effectively prevent vaginal candidiasis by providing audio-visual and modules to pregnant women.

© 2020 Elsevier España, S.L.U. All rights reserved.

### Introduction

Vulvovaginal candidiasis is an infection of the vulva and vagina caused by *Candida* sp. In America 75% of women during reproduction have experienced vulvovaginitis candidiasis. Between 40–50% experience recurrent infections

<sup>☆</sup> Peer-review under responsibility of the scientific committee of the 1st International Conference on Nutrition and Public Health (ICNPH 2019). Full-text and the content of it is under responsibility of authors of the article.

\* Corresponding author.

E-mail address: [asrianaabdullah07@gmail.com](mailto:asrianaabdullah07@gmail.com) (A. Abdullah).

<https://doi.org/10.1016/j.enfcli.2019.10.060>

1130-8621/© 2020 Elsevier España, S.L.U. All rights reserved.

and 5–8% develop chronic candida infections.<sup>1</sup> In women it is estimated that they will suffer from candidiasis vaginialis at least once in their life which is around 75%, of which 40–45% of them will have recurring infections twice or more.<sup>2</sup> In cases of vaginal candidiasis, which is one of the predisposing factors is the use of hormonal contraception and pregnancy.<sup>3</sup> The danger of vaginal discharge for pregnant women are: premature birth, premature rupture of membranes, low birth weight (LBW), danger of vaginal discharge for infants and toddlers whose triggers are hormones and infections, and maternal mortality rate (MMR).<sup>4,5</sup>

Maternal mortality rate (MMR) is one important indicator of public health degree. According to WHO (World Health Organization) in 2010 MMR in Indonesia reached 228/100,000 live births. One cause of maternal death is infection in pregnancy which reaches 50%.<sup>6</sup> In pregnant women, the incidence of vaginal infections is 75% due to the use of vaginal douches and poor hygiene of the genitalia (vulva hygiene). Infection due to poor hygiene of the genital area can cause 10–20% of preterm labor, 50% of cases of preterm labor and premature rupture of membranes (PROM), and 36% of neonatal deaths.<sup>7</sup>

Data on Malang City Health Profile in 2014 showed that the maternal mortality rate in 2014 was 13 cases where based on the data distribution of maternal deaths, Kedungkandang Public Health Center is still in the highest rank of MMR in 2015 with 3 cases and 2 cases in 2016. Based on the results of laboratory tests for STIs (sexually transmitted infections) in pregnant women at the Kedungkandang Public Health Center showed that in 2015 there were 1 case of pregnant women who had bacterial vaginosis and candidiasis. Whereas in 2016 there were 6 cases of vaginal infections in pregnant women, namely: 3 people (50%) had bacterial vaginosis and candidiasis, 2 people (33.33%) had bacterial vaginosis, and 1 person (16.67%) had bacterial vaginosis and trichomoniasis. One of the causes of vaginal infections in pregnant women is the poor behavior of vulva hygiene (washing the vagina) in pregnant women.<sup>6</sup>

Health education is an effort or activity to create community behavior that is conducive to health. Health education is not only the level of public awareness or knowledge about health, but more important is achieving good health behavior. Health education strives for the behavior of individuals, groups, or communities to have a positive influence on the maintenance and improvement of health.<sup>8</sup>

One of the efforts made in order to prevent VVC through various health education is by providing information and communication in accordance with local culture and religion such as counseling and campaigns, electronic media, print media and so on. There are several types of information media that can be used in health education, including print and electronic media.<sup>6</sup>

In delivering messages through lectures it needs to be assisted with modules, so that participants can review the material that was discussed in the lecture. Consideration of the use of modules because this media has advantages in terms of ease of being stored and read repeatedly, involving many people, and makes it easy for the public to recall the contents of the message. Module is a way of organizing subject matter that takes into account the function of education.<sup>6</sup>

One of the media for health counseling is to use audio-visual.<sup>6</sup> The provision of counseling with audio-visual media is a counseling strategy that is proven to have a significant impact and has a major influence in increasing knowledge and changing hygiene behavior.<sup>6,9</sup> The approach using audio-visual media has a higher yield (86%) than the conventional approach (78.33%). The use of audio-visual and visual media (modules) has been proven to change hygiene behavior among pregnant women.<sup>8</sup> Information provided in health education by providing modules and audio-visuals is expected to increase knowledge, attitudes and genital hygiene behavior in order to prevent VVC in pregnant women.

Researchers are interested in further studying the effect of health education by providing modules and audio-visual knowledge, attitudes and genital hygiene behavior in order to prevent vaginal discharge in pregnant women in Makassar City.

## Method

### Literature search procedure

Literature search was collected through Cochrane, Science Direct, Pubmed, Elsevier, Proquest (Link from Unhas.ac.id Library) Pubmed, WHO, CDC, Google Scholar. After collecting the articles, the articles are synthesized. Based on preliminary reviews, the incidence of vulvovaginal candidiasis in pregnant women is increasing and is the cause of premature birth, premature rupture of membranes, low birth weight, so to answer the problem scientifically, a literature review is carried out with the procedures performed in the preparation of this review literature, namely with:

1. Gather information from various sources:
  - a) Journal; Articles found were related to the theme, namely 2009–2019. Accessing international journals through Cochrane Central Science Direct, Pubmed, Elsevier, Proquest (Link from the Library Unhas.ac.id) Pubmed, WHO, CDC, Google Scholar and National Journal used as references in accordance with the theme namely 2009–2019. Access the journal through (Google Scholar) by entering keywords.
    1. VVC: Articles that appear 91 selected 5 articles.
    2. Prevention of VVC: Articles appear 507 and 3 articles are selected.
    3. Health Education with article modules: 2 articles appear and both articles are selected.
    4. Health Education with audio visual: 2 articles appear and both articles are selected.
    5. Pregnant Women of Candidiasis; 802 and 12 articles selected.
  - b) Report Online (Risksedas) and access the Ministry of Health's web: number of references found 2 articles.
  - c) Book: For theory there are some that are quoted from books with the number of books 10.
2. Gather the material that has been obtained into Mendeley's software.
3. Making research synthesis from journals and other materials that have been obtained.

4. Conduct a review of the material obtained to ensure that the Literature Review be
5. Done perfecting information about research variables.

## Result

### Study selection

The search results in the selected database provided a total of 1404 study articles written in English from 2009 to 2019, matching the keywords that needed to be analyzed. Next, the articles are filtered by title, abstract, and keywords; The remaining 201 articles are then reviewed based on their full text. A total of 1203 articles were removed because most of them did not discuss the prevalence, pathology of VVC. Finally, a total of 11 articles were selected in the review without additional articles resulting from scanning the reference list. The inclusion criteria were pregnant women pregnant women who did not experience vision and hearing impairments and were willing to participate in research that was stated with informed consent. While the exclusion criteria in this study are pregnant women who have received information about vulva hygiene and pregnant women who experience vision or hearing problems. The independent variable in this study was the provision of health education about the cleanliness of external genitalia in pregnant women with audio-visual media and modules, while the dependent variable in this study was the behavior of external genital hygiene in pregnant women.

### Characteristics study

This section explains demographic data items from 11 selected articles. The results of this study indicate that 11 studies identified about the development of the Health Education model by providing modules and audio-visual. Based on the results of reading the literature that in the intervention group the average hygiene behavior score before being given health education by audio-visual media was 23.80. After being given health education the average hygiene behavior score increased to 27.80. This shows that there is an increase in the average score of 4.0. Whereas in the control group the average hygiene behavior score before being given health education with leaflets was 26.20. After being given health education the average hygiene behavior score increased to 27.80. This shows there is an increase in the average score of 1.6. The use of audio-visual media and modules in the intervention group and the use of module administration in the control group were shown to be equally significant in improving the hygiene behavior of external genitalia in pregnant women.

## Discussion

### Hygiene behavior of external genitalia for pregnant women before health counseling is given

Hygiene behavior of external genitalia is an action taken to prevent infection and improve cleanliness especially

in genital organs. There are several factors that can affect a person's knowledge and behavior, including: age, experience, work, sources of information, culture, the environment, and education level. The more adequate the age, the more mature someone will be in thinking and acting. The greater the number of parities, pregnant women tend to pay less attention to pregnancy than during the first pregnancy, so it does not affect the genital hygiene behavior in pregnant women. Improved economic status will have an impact on increasing access of pregnant women to health services and information obtained so as to improve genital hygiene behavior.

### Hygiene behavior of external genitalia for pregnant women after health counseling

The provision of health education and the use of supporting media can make it easier for pregnant women to understand counseling material so as to increase knowledge and influence changes in external genital hygiene behavior in pregnant women. Health promotion to enhance the ability to change, grow, and develop positive behaviors so that they can become the foundation for changing health behavior better.

Differences in the effects of health education on external genital hygiene behavior in pregnant women, the factors that can influence the success of health education are the use of right and appropriate media in counseling. Conducted 58-minute video playback has been shown to significantly improve hygiene behavior scores. Whereas in this study, the short video duration and the limited frequency of video playback and the extension participants who paid less attention resulted in the use of audio-visual media to be less effective.

The rapid development of technology has an impact on the increasingly easy health information obtained by pregnant women. The most frequently used sources of health information are the internet (37.6%), family (37.6%), and television (33.6%). In addition, the success of counseling activities is influenced by several factors including the media used and health workers who conduct counseling. According to research is very important for pregnant women in all trimesters to get counseling programs to prevent VVC. Information provided through health education can increase awareness of pregnant women, especially pregnant women in the final trimester to improve genital hygiene behavior in preventing pregnancy complications.

In delivering messages through lectures it needs to be assisted with modules, so that participants can review the material that was discussed in the lecture. Consideration of the use of modules because this media has advantages in terms of ease of being stored and read repeatedly, involving many people, and makes it easy for the public to recall the contents of the message. Modules are a way of organizing subject matter that takes into account the function of Education. With the presence of media in the form of modules and audio-visuals with the right delivery, it is very influential to increase the score of external genital hygiene behavior in pregnant women in preventing the incidence of VVC.

Some things that need to be done as a follow-up to this research are to be able to use other media such as leaflets and compare the results with the use of media in this study.

## Conclusion

The development of a health education model (vaginal hygiene) can effectively prevent vaginal candidiasis by providing audio-visuals and modules to pregnant women.

## Conflict of interest

The authors declare no conflict of interest.

## Acknowledgment

The work was supported by Faculty of Public Health, Hasanuddin University.

## References

1. Cassone A. Vulvovaginal *Candida albicans* infections: pathogenesis, immunity and vaccine prospects. *BJOG An Int J Obstet Gynaecol.* 2015;122:785–94.
2. Tapia CV, Hermosilla G, Fortes P, Alburquenque C, Bucarey S, Salinas H, et al. Genotyping and persistence of *Candida albicans* from pregnant women with vulvovaginal candidiasis. *Mycopathologia.* 2017;182:339–47.
3. Mahmoudi Rad M, Zafarghandi S, Abbasabadi B, Tavallaee M. The epidemiology of *Candida* species associated with vulvovaginal candidiasis in an Iranian patient population. *Eur J Obstet Gynecol Reprod Biol.* 2011;155:199–203.
4. Mtibaa L, Fakhfakh N, Kallel A, Belhadj S, Belhaj Salah N, Bada N, et al. Les candidoses vulvovaginales: étiologies, symptômes et facteurs de risque. *J Mycol Med.* 2017;27:153–8.
5. Olowe O, Makanjuola O, Olowe R, Adekanle D. Prevalence of vulvovaginal candidiasis, trichomoniasis and bacterial vaginosis among pregnant women receiving antenatal care in Southwestern Nigeria. *Eur J Microbiol Immunol.* 2014;4:193–7.
6. Hayati UF, Fevriasanty FI. The effect of health education with audio-visual media toward external genital hygiene behaviors to pregnant women in primary health care of malang working area. *J Ilmu Keperawatan (J Nurs Sci).* 2018;6:124–35.
7. Zisova LG, Chokoeva AA, Amaliev GI, Petleshkova PV, Miteva-Katrandzhieva T, Krasteva MB, et al. Vulvovaginal candidiasis in pregnant women and its importance for candida colonization of newborns. *Folia Med (Plovdiv).* 2016;58:108–14.
8. Nunoa SIIU, Andres S, Avasola R, Ramos AS, Rivera D, Segura K, et al. Pengaruh Pendidikan Kesehatan Dengan Modul dan Media Visual Terhadap Peningkatan Pengetahuan dan Sikap Wanita dalam Menghadapi Menopause. *Arh Hig Rada Toksikol.* 2010;60:982–92.
9. Humairoh F. Syamsulhuda Budi Musthofa, Laksmono Widagdo. Faktor-Faktor Yang Mempengaruhi Perilaku Vulva Hygiene Pada Remaja Putri Panti Asuhan Di Kecamatan Tembalang, Kota Semarang. *J Chem Inf Model.* 2013;53:1689–99, <http://dx.doi.org/10.1017/CBO9781107415324.004>.