

Review Article

Application of the PRECEDE-PROCEED Planning Model in Designing a Genital Health Program

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ABSTRACT

Background: Lack of knowledge and incorrect practices regarding genital hygiene increase the risk of infection. Women can be protected from these infections by teaching correct genital hygiene behaviors through health education based on recognized models. The aim of this study was to design an educational program to improve women's genital health behaviors based on the PRECEDE-PROCEED model.

Methods: This study was an application of the PRECEDE-PROCEED model as a planning tool to design a program to improve genital health behaviors. A comprehensive literature review was performed in Google Scholar, Council of Higher Education Thesis Center, PubMed, and ProQuest databases using the keywords "PRECEDE-PROCEED MODEL" and other related keywords in Turkish and English language from 2000 to 2021. The model was explained in light of the literature, and an exemplary program to improve genital hygiene behaviors was proposed in line with the model steps.

Results: First, using the PRECEDE phase of the model, women's educational needs related to genital health behaviors were determined and the related problems were identified. Then, the PROCEED phase of the model was used for planning, implementation, and evaluation of the educational program based on the educational objectives.

Conclusion: The PRECEDE-PROCEED model provides a framework for nurses to maintain and improve the health of the female genital system. Using this model, it is possible to inform women about genital health, encourage them to participate in self-care, improve health outcomes, and increase their quality of life (QoL).

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Highlights

- In the absence of awareness and poor health behaviors, genital infections increase.
- The identification of risky groups by nurses working in primary health care, giving importance to a protective approach rather than treatment, and conducting planned health training will decrease the incidence and recurrence of genital infections.
- The PRECEDE-PROCEED model can be used to promote genital hygiene knowledge and behaviors by considering multiple factors in changing health behaviors.
- In this study, an educational program to improve women's genital health behaviors was designed based on the PRECEDE-PROCEED model.

Plain Language Summary

The PRECEDE-PROCEED model involves community participation. In this model, content, methods, and media for a particular program are selected according to need. It can be used to promote genital hygiene knowledge and behaviors by considering multiple factors in changing health behaviors. In this study, an educational program to improve women's genital health behaviors was designed based on the PRECEDE-PROCEED model.

1. Introduction

Women experience different health problems depending on the stages of their lives. Especially the age of 15 to 49, which is also called the age of fertility, is one of the high-risk periods for increasing reproductive health problems (Beydağ 2009; Hacialioğlu, et al., 2009).

The anatomical neighborhood of the urethra, vagina, and anus in a woman's body, lack of information about hygiene, and poor genital and menstrual hygiene behaviors are the most common reasons for the occurrence of genital infections in women (Cangöl & Tokuç, 2013; Ilankoon et al., 2017; Kurt Durmuş & Zengin, 2020).

Genital infections can be treated and avoided. However, this infection is mostly neglected by women, and its diagnosis and treatment are delayed. The factors leading to this situation are misinformation of women about vaginal discharge, their disposition to conceal the problems due to privacy reasons, their choice of trying to treat the infection by themselves instead of applying to healthcare organizations, problems accessing healthcare organizations, poor environmental circumstances, and insufficient socio-economic situation (Beydağ, 2009; Cangöl & Tokuç, 2013).

Genital infections can cause serious conditions and if left untreated, can lead to severe disorders, such as pelvic inflammatory disease or genital cancers. In addition to affecting female fertility, these infections can also lead to increased vaginal symptoms and psychosexual problems, such as avoiding sexual intercourse because of cancerophobia or dyspareunia (Ilankoon et al., 2017; Çankaya & Ege, 2014).

Both prevention and early diagnosis and treatment of genital tract infections are possible with planned and effective health education (Baraia, et al., 2017; Sinan, Çamözü & Tosun, 2019). Health education can be provided in a variety of ways, but the use of models ensures that education will be provided in a standard and effective manner. The PRECEDE-PROCEED model, which was developed by Green & Kreuter (1999) to be used for health education, is a guideline for promoting public health. This model includes some educational steps that are designed to create desirable behavioral change. In successive stages, it provides an opportunity for healthcare professionals to describe problems and deficiencies, assess health status through identified problems, and develop a plan for these problems. PRECEDE and PROCEED are acronyms. PRECEDE stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. PROCEED sets out the policy, regulatory, and organizational constructs in educational and environmental development. The reference point of the model is composed of

nine phases: voluntary cooperation, determination of individuals, the degree of change in their knowledge, and active participation in health practices (Özvarış, 2001; Tabak, 2000). The aim of this study was to design an educational program to improve women's genital health behaviors based on the PRECEDE-PROCEED model.

2. Materials and Methods

This study was conducted to present the application of the PRECEDE-PROCEED model as a planning tool for designing a program to improve genital health behaviors. A comprehensive literature review was performed in Google Scholar, Council of Higher Education Thesis Center, PubMed, and ProQuest databases using the keywords "PRECEDE-PROCEED MODEL" and other related keywords, such as genital infection, feminine hygiene, health promotion, and nursing in Turkish and English language from 2000 to 2021. Duplicates and unrelated articles and evidence were removed and fully relevant sources were examined. The model was explained in light of the literature, and an exemplary educational program specific to women's genital health was prepared in line with the model steps.

Literature review

Genital infections

Genital infections are gynecological disorders that every woman experiences at least once in a certain period of her life (Taşkın 2016; Beji 2015; Yücel 2015). These infections occur as a result of the hosting of very few microorganisms emerging without sexual intercourse or coming from the external environment through sexual intercourse in the reproductive organs, or the spread of an infection that exists in reproductive organs (Beji 2015; Yücel 2015). Symptoms, such as rashes, itching, burning in the genital area and/or genital organs, a large amount of malodorous abnormal vaginal discharge, dysuria, and dyspareunia are observed in women during the presence of the infection (Taşkın 2016).

Genital infections are a significant part of women's health problems in developed and developing countries. The prevalence of genital infections in women varies between 37.4% and 74% (Tehrani, et al., 2011; Nadembega et al., 2017; Fang et al., 2007; Torondel et al., 2018). In Turkey, the prevalence of genital infections has been reported as 52-92% (Daşikan et al., 2015; Cangöl & Tokuç 2013). Bacterial vaginosis with 40-50% and Candida and Trichomoniasis with 20-30% are the most common infections of the female genital tract (Cangöl & Tokuç 2013).

There are several reasons for the development of genital infections in women. The risk for the growth of genital infections increases because the urethra, anus, and vagina have an anatomical neighborhood. In addition, some personal and environmental factors may also be effective. Factors, such as low education level, multiple childbearing, vaginal douching, using pads, deficient and incorrect hand washing habits, not using appropriate underwear (cotton underwear), and ignoring hygiene during menstruation periods can be regarded as personal factors (Özkan & Kulakaç 2011; Çankaya & Ege 2014). Environmental risks can include the lack of healthy drinking and potable water, insufficient sewage, and necessary use of public toilets and bathrooms in crowded settings, such as workplaces, schools, hospitals, etc. (Daşikan et al., 2015; Çankaya & Ege 2014).

Importance of genital infection in terms of women's health

The age period of 15-49 years, when a woman is sexually active, is a period when problems of reproductive health increase (Ilgaz, et al., 2015; Yeşilçiçek Çalık et al., 2020). Within the scope of reproductive health, one of the most common reasons for applying to the hospital is genital infections characterized by malodorous abnormal vaginal discharge accompanied by itching, burning, dysuria, and dyspareunia (Holloway 2010; Adibelli et al., 2014; Kısa & Taşkın 2010). In the United States, ten million clinical applications per year are estimated to occur due to vaginal symptoms, such as discharge, itching, and malodor (Mashburn 2012). The prevalence of bacterial vaginosis in the United States is estimated at 21.2 million (29.2%) among women aged 14 to 49 years, according to a study using a national sample of women who participated in the National Health and Nutrition Examination Survey (NHANES; 2001-2004) (Koumans et al., 2007).

Genital infections may lead to problems, such as negative body image caused by increased vaginal symptoms. The fact that a woman feels herself unclean and unacceptable because of malodorous discharge and reduces/breaks up relations with her close circle also negatively influences her social life as well (Holloway 2010; Khan et al., 2009). As a result, while genital infections cause problems, such as social isolation, sexual problems, physical fatigue, reduced quality of life (QoL), and fear of infertility in women, they also lead to loss of time, economic loss, and loss of labor (Çankaya & Yılmaz, 2015; Khan et al., 2009; Bilardi et al., 2013). This common problem is generally not considered a disease and is not considered by women with low socio-economic

and cultural status. Even though women sometimes consider the condition a disease, they treat themselves instead of receiving medical treatment because they are hesitant to have their genitals examined or think they are being stigmatized by their circle (Taşkın 2016). But because genital infections go untreated, they affect a woman's fertility and can also lead to pelvic inflammatory disease and even genital cancer. When assessing women's health, identifying and eliminating risk factors for genital infections is critical to promoting women's health (Sinan et al., 2019).

Ways to prevent genital infections

Today, it is important to avoid disease and protect and maintain health rather than treat disorders. Primary and secondary prevention is important for disease prevention. Primary prevention is identifying risk factors, taking preventative measures against these risks, and developing healthy behaviors. In the area of primary prevention, it is more important for nurses to conduct a thorough risk assessment for genital infections and provide counseling and reproductive health education services for women. Secondary prevention includes early diagnosis and treatment (Sinan, et al., 2019). In this regard, the goal is to prevent the progression of lower genital infections to the upper genitals, support treatment, ensure gynecological control, prevent complications, and protect healthy individuals from possible infections (Sinan, et al., 2019; Erbil et al., 2013).

The Importance of Genital Hygiene Behaviors regarding Women's Health

Among personal hygiene behaviors, genital hygiene has special importance. To prevent genital infections, women should be provided with genital health knowledge and taught proper genital hygiene behaviors (Çankaya & Ege 2014; Sinan, et al., 2019). Genital hygiene is done by taking hygienic measures to maintain the physical health of the genital organs. Among the health behaviors of the female genitalia in the reproductive years are measures that include removing the remnants of urine, feces, and menstruation from the area (Erbil et al., 2013; Dalbudak & Bilgili 2013).

Some of the genital hygiene measures include washing hands before and after each bowel movement, cleaning the area from front to back with toilet paper, using cotton underwear, daily bathing while standing, not using vaginal douche, cleaning the genital area after sex, using a condom if there are signs of genital disease, and changing sanitary pads every 4 to 6 hours. In addition, women

should be informed about the characteristics of normal vaginal discharge and also the need to see a doctor without neglect if the characteristics of the discharge change (Zincir & Temel 2010; Ege & Eryılmaz 2006).

In addition to accurately diagnosing the disease and planning treatment in cases of suspected genital infection in health organizations, evaluating and correcting women's unhealthy behaviors prevents the recurrence of the infection (Kurt Durmuş & Zengin 2020; Yeşilçiçek et al., 2020; Yurttaş Akar 2020).

Role of nurses in developing genital hygiene behaviors

It is important to gain correct hygiene behaviors in improving the reproductive health of women and preventing genital tract infections (Süt 2016). Many studies have been conducted on this subject and found that women are more likely to get genital and urinary system infections due to inadequate hygiene. For this reason, it is necessary to ensure that women gain and maintain healthy genital hygiene behaviors. Nurses have an important role in the prevention of genital infections and should provide continuous health education on pregnancy, childbirth, menstrual hygiene, contraceptive methods, and personal hygiene practices in order to prevent genital tract infections in women (Kurt Durmuş & Zengin 2020).

Preventing women from having genital infections, teaching them about risk factors and symptoms of infections, and teaching them correct personal hygiene behaviors are possible only by providing planned and effective health education. Therefore, encouraging women to receive health education and periodic genital examinations is very important to increase awareness about timely diagnosis, treatment, and follow-up and to improve genital health (Sinan, et al., 2019) Çankaya & Dereli 2015).

When the training is provided for the prevention of genital infections, the nurse should not have a judgmental attitude, should identify problems by listening to the patient and have open and reliable communication, perform appropriate nursing interventions, and evaluate the result (Zincir & Temel 2010).

PRECEDE-PROCEED Model

As a planning model, the PRECEDE model was developed by Lawrence W. Green in 1975. PRECEDE model framework guides the construction of an intervention and its evaluation. In the studies by Krueter, Kaiser and

Green, the term PROCEED was added to PRECEDE model in 1980. Program, policy, environment, and resources can be set and presented by PROCEED (Green & Kreuter 1999). The model, which is a guide for the methods promoting public health, has been used for numerous public health interventions in the United States for more than 20 years (Özvarış 2001).

Factors, such as volunteering, collaboration, personal determination, and changes at the knowledge level are effective in having a successful outcome in the PRECEDE-PROCEED model. In this model, it is important to provide health education for a problem that has been explained correctly to the target audience (Figure 1). The comprehensive structure of the model is appropriate for the use of various practices, such as patient education, patient care practices, school health, and public health education (Tabak 2000). Calano et al. (2019) provided important evidence for the effectiveness of a community-based health program based on the PRECEDE-PROCEED model regarding the knowledge, compliance, and blood pressure control of adults with hypertension living in the community. In this study, mean compliance, systolic blood pressure, and diastolic blood pressure improved significantly after two months, with more than a

25% change. Knowledge scores were significantly higher after the program (Calano et al., 2019). In the study of Ghaffari et al. (2021) to design, implement, and evaluate an intervention based on the PRECEDE-PROCEED model for the oral health of primary school students in Iran, the factors affecting the brushing behavior of children aged 6-12 years were identified and it turned out that this educational program had a significant effect on improving the scores of predisposing, facilitating, and reinforcing factors of children’s brushing behaviors (Ghaffari et al., 2021). Kan et al. (2021) found that chronic disease management based on the PRECEDE-PROCEED model in long-term diabetes management can effectively improve patients’ knowledge of diabetes, lower blood sugar levels, improve self-efficacy and self-management, and improve QoL (Kan, et al., 2021).

The PRECEDE-PROCEED model, consisting of successive steps, enables researchers to identify and analyze problems and obstacles and to enable appropriate planning through identified problems. The main advantage of the model is that it properly focuses on needs assessment at each stage and then develops solutions tailored to the prioritized and ranked issues (Tabak 2000).

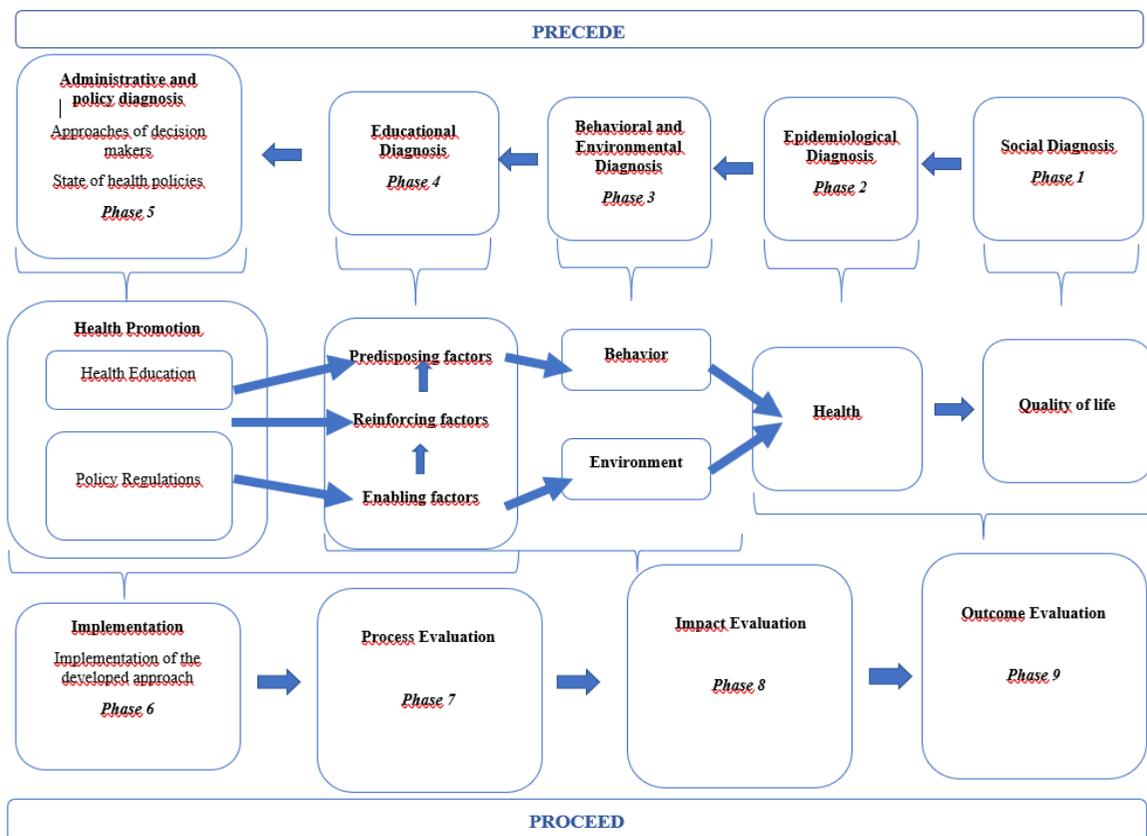


Figure 1. PRECEDE-PROCEED model framework.

Table 1. The designed program using the PRECEDE-PROCEED model for improving genital hygiene behaviors

PRECEDE-PROCEED Model Components	Use of PRECEDE-PROCEED Model for Improving Genital Hygiene Behaviors
PHASE 1 Social Diagnosis	Gynecological complaints of women and the social problems they cause are defined. The demographic characteristics of the women are determined.
PHASE 2 Epidemiological Diagnosis	Genital infections are defined as a result of the gynecological examination of women.
PHASE 3 Behavioral and Environmental Diagnosis	Incorrect genital hygiene practices that cause genital infections in women are determined. The socioeconomic status of women is determined.
PHASE 4 Educational and Organizational Diagnosis Predisposing Factors	Factors affecting genital hygiene behavior are determined. Women’s knowledge levels, beliefs, and attitudes about genital hygiene are determined.
Enabling Factors	Health training is given at the closest health institutions (such as family health centers) that women can reach or planned as home visits.
Reinforcing Factors	After the health education, women are given education booklets containing information on genital infections and genital hygiene behaviors. Women who successfully complete their training are awarded a symbolic certificate.
PHASE 5 Administrative and Policy Diagnosis	Legal permissions are obtained from the relevant health directorates for the implementation of the training program. Discussions are held with the head and staff of the health institution where the training program will be carried out, information about the training plan is shared and cooperation is sought.
PHASE 6 Implementation	A training program is applied to improve genital hygiene behaviors. Sample program: <ol style="list-style-type: none"> 1 The importance of genital infections for women’s health 2 Female genital organs, parts, and functions Sessions <ol style="list-style-type: none"> 3 Genital infections, symptoms and transmission 4 Behavioral risk factors affecting genital infections 5 Ways of protection from genital infections (hand hygiene, perineum hygiene, body hygiene, menstrual hygiene, etc.)
PHASE 7 Process Evaluation	The training provided is evaluated by making measurements before and after the training with measurement tools whose validity and reliability have been confirmed.
PHASE 8 Impact Evaluation	After the training, the effect of the training program is evaluated in periods, such as 1 month and 3 months.
PHASE 9 Outcome Evaluation	After the training program, the changes in the health behavior of women and the situation of applying to the health institution again with complaints of genital infection are evaluated.

Client-Centered Nursing Care

Components of the PRECEDE-PROCEED Model

The PRECEDE stands for seven letters of predisposing, reinforcing, enabling, causes, educational, diagnosis, and evaluation. The term PROCEED, which was later added to the model is an acronym for policy, regulatory, organizational, construction, educational, environmental, and development (Tabak 2000). The model includes social, epidemiological, behavioral, educational, and administration phases that allow the planning and evaluation of health education programs.

Social diagnosis, the first phase of the model, involves the identification of social problems of the population. At this phase, individuals’ QoL and social problems are identified by determining the relationship between a targeted health problem and social problems. After the identification of problems, the education program needs to be planned accordingly. Methods used for social diagnosis might be nominal groups, communication forms, examinations, focus group meetings, and home visits. The second phase is epidemiological diagnosis. Epidemiological assessments help determine which health problems are important to which group in the

community. The epidemiological assessment process includes the assessment of factors affecting the health problem under study. Examples of epidemiological data are statistics, such as prevalence, incidence, disability, and mortality rate. In the third stage-behavioral and environmental diagnosis-health behaviors that affect health problems and have been defined in epidemiological diagnosis are determined. Phase four is the educational diagnosis, which utilizes various theoretical resources for the identification of factors affecting health behaviors determined at the behavioral diagnosis phase. Gaining health behavior is evaluated in three parts as follows; predisposing, enabling, and reinforcing factors. While predisposing factors as antecedents to behavior that provide the rationale or motivation for the behavior involve knowledge, attitude, values, and beliefs about health behavior, enabling factors are programs, services, policies, and resources needed to achieve behavioral and environmental outcomes, and in some cases, new skills needed to make changes in health behavior that allow motivation to be realized. Reinforcing factors are factors (e.g., social support and peer influence) that provide a continuous reward or motivation for the continuation or repetition of behavior. Administrative and policy diagnosis, phase five, focuses on administrative processes before the implementation of the education program. Policy diagnosis analyzes whether the goals and objectives of the program are in line with the goals of the organization. Administrative diagnosis analyzes policies and resources in an organizational situation that help or hinder program development. Identification of resources includes determination of time, funding, the people involved in education, and the units to collaborate. Implementation of the program occurs in phase six. Process evaluation and impact evaluation are carried out in phases seven and eight. Outcome evaluation, phase nine, evaluates the changes occurring in health behavior, QoL, or goals (Green & Kreuter 2005).

The program

After reviewing the relevant literature, the PRECEDE phase of the model was used to determine the educational needs of women regarding genital hygiene behaviors and identification of the problems, and after setting the goals, the PROCEED phase of the model was used for planning, implementation, and evaluation of the educational program. The planning, implementation, and evaluation of the educational program in accordance with the PRECEDE-PROCEED Model is shown are [Table 1](#).

3. Conclusion

The PRECEDE-PROCEED model is one of the most comprehensive and widely used frameworks to guide the development of population health interventions. This study presented the application of the PRECEDE-PROCEED model as a planning tool to design a program to improve genital health behaviors. By examining the relevant texts, this study tried to adapt the model steps to improve the health of the genital area and provide a suitable program in this regard. The program developed in this study can be used in the form of a clinical trial to comprehensively educate and evaluate the genital health of women. It is also recommended to use this program to educate women in the relevant clinics.

Ethical Considerations

Compliance with ethical guidelines

Ethical issues related to authorship were considered. The authors tried to write with a level of inclusion, respect, and appreciation of diversity.

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Authors' contributions

Both authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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