



Research Article

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An Intervention Model for a Risky Health Behavior in Minorities Facing Cultural and Global Health Challenges: The Case of Twalèt Déba (Feminine Hygiene)



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Abstract

This article focuses on the linkage between a worldwide culturally practiced feminine hygiene, considered by many as a health risk behavior, by four ethnic groups: Haitian, Mexican, Latina and Turkish women termed twalèt déba (vaginal cleanliness), and the human papilloma virus (HPV) leading to cervical cancer. A necessary debate warrants further analysis because the factors leading to HPV were not fully explored by previous research endeavors; and the connection between the practice and cervical cancer is not clearly exposed. The cultural and health behavior determinants are not easily framed for a deep understanding of the epidemiological and on ecological tentacles of this feminine practice. There are also elements of socio-economic disparities seen as barriers to HPV testing. A human papilloma virus disparity intervention model is proposed (HPVDIM) as the first assessment tool created prior to the current existing interventions of HPV testing and HPV vaccine. The contribution can be positively appreciated considering the void existing in the literature.

Keywords: Feminine hygiene; twalèt déba; Risky behavior; HPV; Cervical cancer; HPVDIM

Introduction

This paper presents an intervention model for a risky behavior linked to the human papilloma virus (HPV), and cervical cancer, in four minorities (Haitian women, Mexican immigrant women, other Latinas (Hispanic) and Turkish women) facing cultural/traditional, religious, and global health challenges, termed as Twalèt Déba (feminine hygiene) in Haitian culture, vagina cleanliness with water and soap, or genital hygiene, and douching in others [1-8]. Vaginal douching is widely performed worldwide, and is defined as a practice that entails washing the vagina with water, or other solutions to ensure a sense of cleanliness, tightness, elimination of discharge, dictated by cultural or religious mores, and to prevent pregnancy [8,9].

The risk factors associated with HPV vary: vulvovaginal candidiasis, pelvic inflammatory disease (PID), preterm delivery, cervical carcinoma, urinary tract infection, sexually transmitted disease (STI), and ectopic pregnancy [8,9]. The HPV disparity and intervention model (HPVDIM) [10] is intended to be a preventive scale, which can be used prior to HPV testing, adherence to

research protocols, and participation in community health projects. The scale will allow researchers to determine levels of awareness and knowledge in individuals susceptible to HPV, and community organizations, or other institutions' readiness in providing services and testing, within the parameters of evidence based interventions. It can be understood under the purview of several health and social psychology frameworks that are specifically congruent with the bio-psychosocial model, social ecological model of prevention, the health belief model (HBM), and the general self-efficacy (GSE) theory.

The literature surveyed showed a lack of HPV scale, when compared with some HPV vaccination scales, and scant questionnaires [11-13]. The research project presents an overview of the human papillomavirus (HPV) and cervical cancer in targeted populations, and worldwide.

The following preliminary research questions formulated are enunciated below:

- a. How can HPV prevention and knowledge enhance the understanding or cervical cancer?
- b. What kind of outcome will an enhanced comprehension of HPV, and cervical cancer have on the cultural/religious practices of feminine hygiene (Twalèt déba), and other cultural contexts?
- c. How can the amalgamation of HPV prevention and knowledge, cervical cancer knowledge, and cultural perspectives within these populations impact incidence and prevalence rates of cervical cancer, and STI (sexually transmitted infections)?
- d. To what extent can evidence-based interventions and community resources sustain HPV testing rates in the minority populations?
- e. What could be the effects of the HPVDIM scale on the minority populations?

Overview of HPV, cervical cancer worldwide, and targeted populations

According to the Department of Health and Human Services (DHSS), Center for Disease Control and Prevention, and the National Cancer Institute 2017, although cervical cancer has decreased for the past 40, or 50 years [14], in 2014, 12,578 women in the United States were diagnosed with cervical cancer; and 4,115 women in the United States died from cervical cancer. Such alarming trend indicates that awareness, knowledge, preventive measures, and the risks associated with cervical cancer, are more than ever important in the fight to minimize the root causes, sustain disease control, or health protection measures, and policy formulations.

The Center for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, reported that women ages 21-65 who received a Pap smear in the past 3 years, by State, 2000-2010 totaled 84.4%. The District of Columbia had the highest percentage in the nation with 91%. In California, the rate was 85% in 2010. However, in Turkey, pap smear is taboo; and for young girls, it implies premarital sex, which is sanctioned [15]. In steady course with the causes of cervical cancer, infection from the human papillomavirus (HPV) was the leading indicator of all cervical cancers in Florida in 2010. The percentage was 82.6% in 2014; and HPV was among the most sexually transmitted disease in the United States. The American College of Obstetrics and Gynecologists (ACOG) recommends that women between the ages 20-31 be tested every 2 years. Women age 30 or greater who had 3 consecutive negative test results, may be screened one time every 3 years.

A look at Turkey showed a population of 30.11 million women aged 15 years and older at risk for developing cervical cancer. The crude incidence rates of HPV-related cervical cancer were 4.5%, with an annual incidence of 1686, and mortality of 683 in 2017. Cervical cancer ranks as the 11th leading cause

of women cancer in Turkey [16] reported that HPV was the second leading cause of cancer-related mortality among women worldwide. To foster awareness, disease control, in order to improve health, and health behavior changes, the National Prevention Strategy of the United States Department of Health and Health Services postulates four strategic directions to guide the nation's prevention efforts towards diseases [17].

The directions enunciated are:

- a. Health and safe community environments.
- b. Clinical and community preventive services.
- c. Empowerment of people.
- d. Elimination of health disparities.

Health disparities

According to Garcini et al. (2015), across ethnic lines there are serious issues of disparities in awareness, and knowledge of HPV infections among 1st and 2nd generation Asian-Americans, and 1st and 2nd generation Latinas in California. Latina women suffered great disparities compared to other ethnic groups in cervical cancer screening rates attributed to Pap smear [1]. The main disparities consisted of socioeconomic, cultural factors, and high-risk behaviors. In Florida, Haitian immigrant women in Little Haiti, in Miami Dade County face the same issues of awareness and knowledge of HPV, multiple barriers to Pap smear screening, high-risk behaviors relating to inequitable health access, language barriers (lack of English), socio-cultural factors, fear of deportation, perceived susceptibility, and perception of health and illness [6,7,14].

Cervical cancer is a public health issue affecting not only Asian-Americans, Latinas (Hispanic women), and Haitian women in Little Haiti, Miami, Florida, but a broad spectrum of women statewide, communities, and social institutions [14]. In Turkey, the disparities linking socioeconomic factors with socio-demographic characteristics (age, religion, place of residence, and poverty) have influences women's attitudes towards douching, but the perceptions of health seemed to be tied to practices and beliefs of feminine hygiene of cleanliness, religious and cultural factors. A complete assessment is needed [4,8,9].

The CDC [18] estimated that from the 11,700 new cases of HPV-associated cervical cancer diagnosed annually in the United States, Blacks and Hispanic women have a higher rate of HPV-associated cancer than Whites. The reasons are tied to limited access to pap testing and follow-up [19]. In Miami-Dade County, Florida, cervical cancer is about 8.9% compared to the USA rate of 7.6%, although the age-adjusted rate case per 100,000 is 10.2 average annual count of 147. The Florida Behavioral Risk Factor Surveillance System (BRFSS) survey reported in 2010 an incidence of 857 new cases of cervical cancer diagnosed, with a mortality rate of 312. Racial and foreign-born, and medically needy women experience increased risk of developing and dying

from cervical cancer due to their deprived economic status, lack of access, and underutilization of screening [20]. The Haitian women in Little Haiti in Miami Dade County fit this category.

The socio demographic data shows income below the poverty level. Nonetheless, the lack of specific research targeting the risk factors associated to cervical cancer (smoking, increased full-term pregnancies, long term use of contraceptives, and multiple sexual Partners) [21] for this population suggests the problems associated with HPV are deeply rooted. Risk factors associated with HPV for Turkish women consisted of disturbances in vaginal flora, ectopic pregnancy, PID, cervical cancer, preterm delivery, endometritis, and upper genital tract infections [4,8,9].

Populations

The literature presents a vast array of women. Four hundred and five Haitian women (Haitian descent and Haitian born) living in Little Haiti, an enclave in Miami-Dade County, Florida, a purposive sample of 20 Mexican immigrant women in California, a meta-synthesis of 9 studies of women consisting of 668 participants originated from Latin and South American countries, and the Caribbean islands; and 3 sample sizes of 1419 Turkish women who perform traditional genital hygiene consisting of douching, and application of other substances for genital health and sexual activities, consisted the backbone of this intervention research project [1,4-8,10,20,22,23]. The Turkish populations consisted of three research types: a) a cross-sectional study conducted at a women and child hospital in Istanbul with a sample size of 178 women, age range of cases 20-60. b) a study in Antalya with a sample size of 776 women, aged between 15-44 years, and c) another cross-sectional study of 465 Muslim women in Matalya, aged 15-49 years.

Barriers to Pap Smear Screening

The Haitian, Latinas (Hispanic women), and Mexican immigrant women were all related to a low socioeconomic status (SES) with regards to their inability for screening such as Papanicolaou (Pap smear) test [24,25] and lack of access to preventive health services, curative treatment or palliative care [1,17,24]. McMullin [5] posited that the Latina (Hispanic women) immigrants' lack of health insurance is an economic factor that inhibits HPV screening, and culture as well, which include beliefs about cervical cancer such as "immoral", fatalism and knowledge. For the Haitian women the degree of dependence on their partners, and willingness to improve their sexual pleasure, citizenship and immigration status, language and socio-cultural factors, are considered as forms of barriers [7].

The Turkish populations showed a lack of knowledge, and communication confined within certain schemes associated with religion, fear of premarital sex perceptions, which is taboo and sanctioned in the society [9]. Perceived as a normal behavior, vaginal douching, or *twalèt déba* continues to guide their beliefs and concerns. The related attitudes of the eastern Turkey Muslim women, associated with the sample size of 465 show a

correlation between their educational levels as literate, totaling 366, and high school level of 99, were also considered as barriers [25].

The role of genotyping and ill-assessed risk factors

The ongoing research on the role of cancer biomarkers leading to cervical dysplasia among the Haitian [26], Latinas (Hispanic women), Mexican immigrant women, and Turkish women to arrive at an HPV type or types for vaccination promotion is well researched in the literature [4,23,27]. Nonetheless, the guideline for assessing HPV types 16, 18 genotyping for minority women in the U.S, and Turkish women with cervical cancer seem to evolve [23,28], require closer scientific inputs, and large scales analysis and revisions.

The results linking vaginal douching (VD) and *twalèt déba* to Types 16 and 18 appear to be objectively or scientifically warranted, and juxtaposed with other factors not considered. The reason could be due to HPV types or variants, or the lack of variant types for all the risk factors associated with cervical cancer. Another consideration is the silence by most of the researchers to link a specific type of feminine hygiene causing vaginal or cervical mucosa erosions that lead to HPV and cervical cancer. More needs to be done to completely assess cervical and vaginal mucosal lesions associated with vaginal douching only, and *Twalèt déba*, although HPV 16 and 18 accounts for 70% of cervical cancers globally [27]. In terms of epidemiology, it would be asinine not to report that epidemiology statistics show that HPV 16 and 18 are the most compelling carcinogens for all high-risk types.

The missing link about *twalèt déba* and douching

Inexistent in the researchers surveyed is the controversial scientific literature linking cervical and vaginal lesions resulting from douching, and or *Twalèt déba* to the types of vaginal chemical agents used such as boric acid (borasol, boron) dissolved powder in water with the effects of cleansing and tightening the vagina, and other feminine agents: lemon juice, castor oil, pigeon pea (pwa congo), aloe vera, potassium permanganate [7]. In the Haitian culture, douching (VD) is also practiced after a woman gives birth. Douching refers to sitz baths (vapors) consisting of aromatic leaves: papaya, sour orange, sour soup (corossol), and mint (*tibaume*), anise, bugleweed and eucalyptus that the woman uses in her first post-partum days to relax and tighten the cervix and vagina. The same leaves are also used for teas [29].

Mandal & Balodi [30] reported acetic vinegar, functioning as an acidifying agent, and sodium bicarbonate as an alkalizing agent among the many types of vaginal products used by women. DHHS report on the background and environmental exposure to boron (boric acid) in the United States showed that exposure to boric acid is through ingestion of food, and in drinking water generally range from <1 to 3 mg boron (boric acid). However, exposure to higher doses can be fatal (p.1). Furthermore, no epidemiology studies have identified an association between

boron exposure and development of cancer (p.13).The ill effects of most of these agents: lemon juice, croton flavens, pigeon pea, potassium permanganate, potassium aluminum sulfate, and boric acid with water used by Haitian women, water and/or other solutions for Latinas (Hispanic women), Mexican immigrant women, and Turkish women, have not been fully studied in relation to their potential effects, and codified in the literature.

For example, epidemiological studies have linked boric acid to upper respiratory and ocular irritations, and no associations were found between exposure to boric acid and indices of infertility in Turkish women [31], and boron mining and processing workers in California [32,33] studied 1,059 rural Turkish women and applied higher boron (boric acid) intake about 8 times exponentially higher urinary boric acid concentration, with lower incidences of cervical cancer. The National Institute for Occupational Safety and Health (NIOSH) reports that exposure to potassium permanganate on the skin leads to redness, skin burn, and pain. The preventive measures recommended are to wear gloves, and protective clothing. Long-term exposure may affect the lungs, resulting in bronchitis and pneumonia (NIOSH). The hypotheses generated from these studies were paramount, but the causal relationships between the feminine hygiene agents, their chemical and pharmaceutical agents and HPV and cervical cancer, warrant further studies. The HPV type attributions should also be examined under the oncogenic lens due to their predispositions to cervical cancer (dysplastic squamous cells with raisinoid nuclei and hyperchromasia) [21]. A patient's complete history is essential.

Theoretical models

Theoretical frameworks are important to understand the women's health and wellbeing, where socio cultural and religious determinants are highly important. In this intervention project, Bandura's social cognitive theory (SCT) is associated with the bio-psychosocial model for a better appreciation of the determinants of health, and how social factors influence human development and actions [34]. SCT describes factors that influence behavior through a multilevel scheme [35]. The bio-psychosocial model recognizes the equal importance of the psychological, and social factors, and posits that interactions can be multi factorial [36,37]. The proposed intervention embraces the same approach claiming that CBR (community-based resources, EBI (evidence-based interventions), and the participants' risk factors leading to cervical dysplasia can be mustered for analysis and confirmation.

The above theoretical framework bio-psychosocial model is congruent with the social ecological model of prevention, the health belief model (HBM), and the theory of planned behavior (TPB). These theories can nicely correlate with the implementation or an awareness campaign about cervical cancer screening testing. In the health belief model, an individual considers his or her participation in a prevention programs if there is a perceived susceptibility, perceived severity, perceived

benefits, barriers, promptness to action, based on confidence in their actions[(self-efficacy) [26]. The social ecological model of prevention asserts that a disease prevention continuum needs to have 4 pillars: a set of individual's beliefs and influence, an interpersonal framework of influence, a community apparatus to sustain the degree of influence, and finally societal influences. The theory of planned behavior (TPB) advances that there is an underlying behavior intention that drives an individual's perception and towards a behavior evaluation.

The HPV Disparity and Intervention Model (HPVDIM)

As enunciated earlier, the HPV Disparity and Intervention Model (HPVDIM) seeks to be a scale serving as a bridge between the participants exhibiting high risk behaviors related to the feminine hygiene practice known as douching, and Twalèt déba, community organizations, or other institutions involved in the implementation of policies, evidence-based interventions aimed at increasing HPV testing, or screening to decrease cervical cancer rates. Currently, there is not a research that utilizes a combined scale to assess beliefs, knowledge, community-based resources, and evidence-based interventions. The closest scales are: the Carolina HPV Immunization Attitudes and Beliefs Scale [36] which measures parents' attitudes and beliefs towards vaccination, a survey research assessing current levels of awareness and knowledge, and HPV-related beliefs of a racially diverse population of students from Florida State University (FSU), and Florida Agricultural and Mechanical University (FAMU) [12] a mailed self-administered questionnaire to 500 university students to evaluate knowledge, attitudes and behaviors about HPV [13] Haitian immigrant women's knowledge, attitudes and beliefs regarding HPV vaccination towards their daughters [22], the California Health Interview Survey assessing health disparities in awareness and knowledge of HPV among ethnically diverse women and a study identifying differences in knowledge and attitudes about HPV among Black and White women in Person County, North Carolina.

The model is construed upon six pillars:

- a. HPV scale
- b. Participants
- c. HPV beliefs scale
- d. HPV knowledge scale
- e. CBR (community-based resources)
- f. Evidence-based interventions (EBI)

The HPV disparity and intervention model (HPVDIM) consists of 25 questions. Each scale consists of 5 items questions to assess perceived barriers to screening, perceived effectiveness, beliefs, knowledge, role of the community-based resources, and EBI. The scales will allow researchers to determine levels of awareness and knowledge in individuals susceptible to HPV, and community organizations, or other institutions' commitment to

action The 25 questions/items are assigned a range of 2-4-points each. The total score is 100. Higher values indicate higher perceived effectiveness, beliefs, knowledge, CBR role, and EBI.

The proposed model is depicted in Figure 1 together with the content of the HPV scale. Table 1 shows the HPV scale.

Table 1: The HPVDIM Scale.

Participants	HPV Knowledge	HPV Beliefs	CBR	EBI
I never experienced HPV screening before Score:	HPV is related to having sex without a condom Score:	I practice vaginal douching/Twalèt déba as part of my cultural/religious beliefs Score:	I think there are good organizations or community centers that can help Score:	There are various studies linking HPV with cervical cancer Score:
I think HPV testing is a safe procedure Score:	Having HPV suggests that I am an immoral woman Score:	I have been practicing vaginal douching/Twalèt déba as part of my feminine hygiene, and to enhance my sexual experience Score:	How can I find a good organization that provides HPV screening? Score:	How effective is the HPV screening intervention program? Score:
I do not have health insurance. HPV screening can be costly Score:	I don't have enough information about HPV Score:	HPV can be a problem to someone's health and cultural practice Score:	How long do you think you should wait for an appointment? Score:	If I am tested for HPV, such information is very important to prevent others Score:
I have coverage through my spouse or a partner Score:	I think the HPV vaccine is too new for girls to get it Score:	In my culture, it is taboo to have HPV screening Score:	I don't have transportation, and it is hard for me to go to the organization Score:	The HPV vaccine has helped many girls in my community and others Score:
I am concerned about HPV because of my sexual life Score:	I am concerned about HPV because of my sexual life Score:	HPV screening exposes someone's premarital sex privacy Score:	I am concerned that the community center may not be able to help Score:	I was told about cervical cancer research resulting from HPV Score:
Total	Total	Total	Total	Total

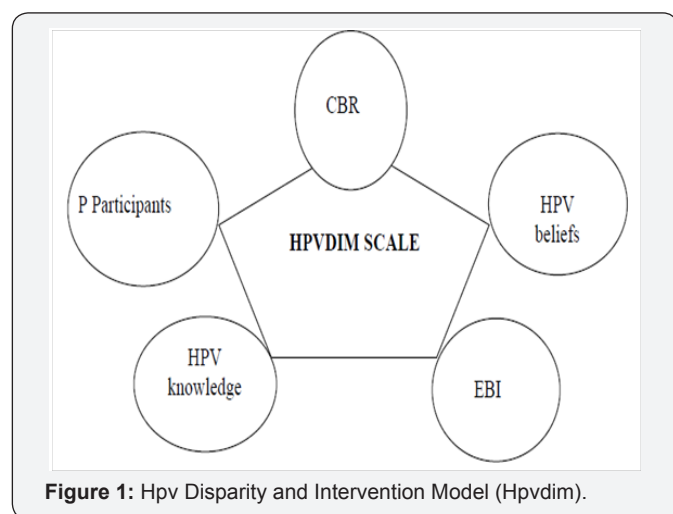


Figure 1: Hpv Disparity and Intervention Model (Hpvdim).

The HPVDIM Scale

The participant scale consists of the following 5 questions. Each is assigned a range between 2-4 points. (Please add your score between 2 and 4 next to each question).

- a. I never experienced HPV screening before.
- b. I think HPV testing is a safe procedure.
- c. I do not have health insurance. HPV screening can be costly.
- d. I have coverage through my spouse or a partner.
- e. I am concerned about HPV because of my sexual life.

The HPV knowledge scale consists of the following 5 questions. Each is assigned a range between 2-4 points. (Please add your score between 2 and 4 next to each question).

- a. HPV is related to having sex without a condom.
- b. Having HPV suggests that I am an immoral woman.
- c. I don't have enough information about HPV.
- d. I think the HPV vaccine is too new for girls to get it.
- e. How effective is HPV in averting cervical cancer?

The HPV beliefs scale consists of the following 5 questions. Each is assigned a range between 2-4 points. (Please add your score between 2 and 4 next to each question).

- a. I practice vaginal douching (VD)/Twalèt déba as part of my cultural/religious beliefs.
- b. I have been practicing vaginal douching (VD)/Twalèt déba as part of my feminine hygiene, and to enhance my sexual experience.
- c. HPV can be a problem to someone's health and cultural practices.
- d. In my culture, it is taboo to have HPV screening.
- e. HPV screening exposes someone's premarital sex privacy.

The community-based resources scale consists of the following 5 questions. Each is assigned a range between 2-4 points. (Please add your score between 2 and 4 next to each question).

- a. I think there are good organizations or community centers that can help.
- b. How can I find a good organization that provides HPV screening?
- c. How long do you think you should wait for an appointment?
- d. I don't have transportation, and it is hard for me to go to the organization.
- e. I am concerned that the community center may not be able to help.

The evidence-based intervention scale consists of the following 5 questions. Each is assigned a range between 2-4 points. (Please add your score between 2 and 4 next to each question).

- a. There are various studies linking HPV with cervical cancer.
- b. How effective is the HPV screening intervention program?
- c. If I am tested for HPV, such information is very important to prevent others.
- d. The HPV vaccine has helped many girls in my community and others.

- e. I was told about cervical cancer research resulting from HPV.

Strengths and limitations of the HPVDIM

As the only model that incorporates HPV knowledge, HPV beliefs, the role of community based resources and evidence-based interventions, the HPVDIM model seems to position itself as a viable tool for health or social psychology research, and further interdisciplinary outlooks. However, the model has not been tested; and as such, its apparent limitations are clearly spelled out. It is limited to critical theories. Although the model can be understood as a contributor to paradigm change [38-41], its adherence to the research protocols has not been yet proven [42-44].

Conclusion and Recommendations for Practice and Future Research

In this intervention research article, the literature shows an association between HPV screening and cervical cancer linked to a specific risky health behavior in 4 minority populations, namely vaginal douching and Twalet déba for Haitian women in Miami. Questions of disparities attributed to socioeconomic status play a great role in the lack of HPV screening or testing, as well as women dependency on their sexual partners due to lack of income [45]. Cultural and religious beliefs are some of the barriers the women in these studies face. The literature associated with HPV types, as prevailing factors leading to cervical cancer, is not cohesively complete. Many questions about the risks factors associated to HPV, and cervical cancer, based on the cultural hygiene practices seem to persist [46]. The recommendation is to use the HPVDIM scale as an interdisciplinary tool to advance the research inquiries towards new paradigms and solutions. It is hoped that the intellectual inquiry will continue as new research boundaries are formed [47]. The HPVDIM seems to be one of them.

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