

Applying the Health Belief Model to cervical cancer screening

Aplicación del Modelo de Creencias en Salud para el tamizaje del cáncer cervical

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RESUMEN

El objetivo de este trabajo es revisar estudios publicados que examinaran factores que influyen en el tamizaje del cáncer cervical usando el Modelo de Creencias en Salud. Las bases de datos de MEDLINE y de PsycINFO y la búsqueda manual fueron utilizadas para identificar los artículos. La revisión crítica de la literatura usando el marco teórico del modelo de la creencia de la salud identificó varios factores que influenciaban el cáncer cervical. Dado que el uso del HBM es cohibido por los componentes emocionales, sociales y ambientales que son característicos en diversos subgrupos de mujeres en el riesgo de conseguir el cáncer cervical, se recomienda que otras variables sean tenidas en cuenta para este diagnóstico cuando la salud y las estrategias educativas van a ser puestas en ejecución.

PALABRAS CLAVE

Modelo de Creencias en Salud

Cáncer cervical

Citología

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ABSTRACT

The aim of this study is to review published studies that examined factors influencing cervical cancer screening behavior using the Health Belief Model. MEDLINE and PsycINFO databases and manual search were used to identify articles. Critical review of the literature using the theoretical framework of the Health Belief Model identified several factors influencing cancer screening uptake and compliance. Given that the application of the HBM is restrained by the emotional, social and environmental components that are characteristic in different subgroups of women at risk of getting cervical cancer, it is recommended that other variables from different behavioral approaches be taken in to account when health and educational strategies are going to be implemented.

KEY WORDS

*Health Belief Model
Cervical cancer
Pap smear
Screening
Theoretical models*

Cervical cancer is one of the most significant health problems that nowadays threatens sexually active women. It is decided to assess this specific health problem in light of the constructs of the Health Belief Model (HBM) in order to evaluate the effectiveness and applicability of this behavioral framework in recognizing the main factors that might encourage or limit women to adopt the most adequate preventive health behaviors regarding cervical cancer.

This paper is divided in three parts. In the first one, it will describe the epidemiological importance of

the cervical cancer and explain the current risk in which sexually active women are placed in relation to cervical cancer. In addition, It will provide a brief overview about the cognitive constructs on which the HBM is based. In the second part, it is going to mention the applicability of the HBM according to what recent studies have demonstrated (either by assessing the whole framework of the HBM or by evaluating some its components). Moreover, it will discuss the usefulness of the HBM in explaining and predicting screening behavior on different populations of women. Finally, it will address some of the aspects that should be added and taken into account, in the use of the HBM when health and educational strategies are going to be implemented.

Cervical cancer (CxCa) represents a significant public health risk to sexually active women during their span life. An estimated of 15,700 new cases of cancer of uterine cervix and 4,900 deaths from this disease were expected to occur in the United States in the next decade. (1) For a long time, the Papanicolaou smear (Pap smear) has been considered the most helpful test used for detecting cervical lesions at early stage. (2) Due to the high effectiveness of this preventive screening, women's incidence of invasive cervical cancer has substantially decreased. However, the greatest part of women who die from cervical cancer are in general those who have never had history of previous Pap smear uptake, or who have long intervals between Pap screenings. (3,4) Only, approximately 50 % of women from developed countries such as the U.S. have had Pap smears within the past two years, which implies that the actual statistics related to women's incidence of CxCa and the low participation in screening programs are alarming. (5) Therefore, it is imperative that health authorities have a better understanding not only of the direct risk factors for cervical cancer that predominate in different subpopulations of women, but also of the cognitive, emotional, and environmental aspects that might influence women's decision to participate actively in preventive screening programs.

The frameworks of many theories and models of behavior suggest that beliefs have a significant role in explaining and determining health behavior. In the last decades, among different behavioral theories, the Health Belief Model (HBM) has been considered to be one of the most representative ones due to its effectiveness in explaining change and maintenance of health behavior. (6) Likewise, this model has provided a valuable theoretical framework in relation to the difficulties in attendance and uptake of preventive services support. For this reason, it is necessary to understand not only the main fundamentals on which this model is based and the relationship among them, but also the ways in which this model examines issues of public health concerns.

The HBM specifies four motivational cognitions which provide the motivational impulse to perform a specific behavior. *Perceived Susceptibility* refers to individual's perceptions of vulnerability to contract a specific disease, illness or condition. *Perceived severity* is defined as the individual's perceptions about how serious or severe that condition could be. The HBM postulates that feeling vulnerable to a condition and assuming it as a serious health problem, are motivational factors that increase the likelihood that people will take action to prevent that condition. On the other hand, *perceived barriers* are considered those costs or impediments that might prevent an individual from undertaking an action or behavior. *Perceived benefits* are defined as individual's perceptions about the efficacy of taking a preventive action in reducing the negative impacts in her or his welfare. Hence, action would result in a benefit outcome to one's health conditions. The HBM posits that the likelihood of taking an action is determined by beliefs that the barriers to action are outweighed by the benefits of the action. *Cues of action* are those factors that serve to stimulate or prompt health-related behaviors. Those specific cues of actions (media publicity, environmental events) are considered to be necessary for the preventive action to be adopted. (7) Accordingly, the applicability of the HBM is reflected by its effectiveness for assessing educational needs (in

terms of the beliefs described by its cognitive components) that are very significant for the implementation of different educational and preventive strategies. (8)

In the last decade, research has demonstrated that the HBM is useful for determining the main aspects that might influence either positively or negatively women's uptake of cervical screening and predict the adoption and maintenance of this behavior. In addition, many studies have identified different subgroups of women who are considered to have special susceptibility of getting cervical cancer. At this point it is going to analyze the applicability of the HBM in explaining and predicting screening behavior among subpopulations of women defined by age and sexual orientation.

Recent epidemiological studies suggest that young women are placed at considerable risk for developing neoplastic cervical lesions and getting STDs, especially, Human Papilloma Virus (HPV) infections due to their unsafe sexual behaviors (non-protected sexual intercourses). Among the central causal agents related to cervical cancer, the HPV infections are considered to be the main contributor of the development of this disease. (9) With the aim to better understand the young women's actual awareness about the health implications of HPV infections, consequent development of CxCa, and the efficacy of regular Pap smears in detecting cervical lesions at early stages, Burak and Meyer (10) used the HBM as the pivotal cognitive framework to evaluate a population of 400 female students. There were concluded that low perceived susceptibility, wrong beliefs regarding Pap smear procedures, lack of knowledge about CxCa, and its strong association with STDs (especially HPV) were considered relevant aspects influencing women's intention to get regular Pap smears.

In addition, the subpopulation of adolescent women has been a special target of a lot of health research, not only because of their high risk of contracting STDs and, consequently, developing CxCa lesions, but also because of the different

aspects that lead this population to have low participation in cervical screenings. Knowledge about Pap smears and pelvic examination are poor among this population. Adolescent women's lack of knowledge about CxCa, risk factors, and cervical screening techniques are considered cognitive aspects that strongly influence the low perceived susceptibility of this population for getting CxCa. (11, 12) In a similar manner, Najem and others (13) intended to assess the role that inner-city adolescent women's knowledge, beliefs, and attitudes regarding cancer had in their active participation in regular pap smears. It was concluded that besides the low awareness about the general aspects related to CxCa and its preventive strategies, there are external barriers such as lack of physician's recommendations and economic limitations that strongly influenced adolescent girls' lack of intentions to get regular Pap smears. This was reflected in the fact that just half of the adolescent sexually active had never had a Pap smear test before.

According to the findings revealed in these studies, overall, the assessment of the HBM components proved effectiveness in supplying relevant information about the correlation between young women's cervical screening behavior and their knowledge and beliefs regarding CxCa. It seems that, the lack of knowledge about aspects such as: severity and consequences of both, CxCa and of STDs, cervical screening procedures, implications of risky sexual behaviors, and accessibility to preventive screenings programs are some of the main barriers that constrain this population from getting regular Pap smears. As a consequence, the lack of awareness about this matter leads the population to perceive themselves as less vulnerable to get CxCa and delay their active participation in preventive screening programs. Overall, the evaluation of these studies leads us to assume that even though the assessment of the HMB allows us to better understand the cognitive aspects influencing cervical screening participation in young women, it is not enough to get a holistic notion about all the possible factors that might influence this population's health behavior.

Young women's screening behavior is complex and is influenced by a lot of social, environmental, and emotional factors. There are different emotional and environmental factors that might limit adolescent women's decision to participate actively in cervical screening programs. For instance, the majority of women adolescent depend economically on their parents. Nor do they have a direct access to different preventive health programs. Given that this group of women might not feel comfortable asking their parents to take them to periodical gynecological exams (because of their confidentiality or implications that their sexual behaviors might have in their family living and norms), adolescents might decide to remain without taking preventive measures related CxCa. Among those preventive measures, asking for a counselor's advice about the aspects that should be taken into account when having safe sex, and engaging in active participation of cervical screening programs, there are relevant actions that might be helpful to reduce this population risk of getting cervical cancer. In addition, as it was described by Najem (13), the role of health workers' advice and recommendations represent a significant external variable that might directly influence cervical screening behavior in this population. Besides the external factors mentioned here, there are a lot of typical emotional factors in adolescents such as embarrassment and anxiety that have also a relevant influence in this cervical screening behavior. Due to this fact, the limitations of the HBM in explaining and predicting screening behavior among the population of young women are clearly revealed in the fact that it includes neither emotional, nor social, nor environmental aspects that are involved in the adoption of preventive actions against cervical cancer.

On the other hand, regarding the population of older women, current studies have demonstrated that this group of women is also prone to invasive CxCa due to their low participation in periodical cervical screening. (14) Given that the cognitions that influence this population to have regular cervical screenings might be different from those that influence young women in this regard, few studies have attempted to use the assessment of the

cognitive components of the HBM to identify those aspects. For instance, Henning and Knowles (15) used the framework of the HBM as a predictor of older women's intentions to get regular Pap smears. They concluded that cognitive variables such as perceived susceptibility (low risk perception for not being sexually active), and perceived barriers (embarrassment with doctor, fear of results, indignity of the examination, and sex of the doctor) supplied an effective justification that might explain why older women have low participation rates in cervical screening. By comparison, research conducted among older low-income Mexican-American women (16) demonstrated that the low awareness and knowledge about cervical cancer and their subsequent low perceived susceptibility significantly influenced their likelihood to have regular cancer screening in the past. However, cultural and sociodemographic aspects such as age, low english-speaking ability, low income, low educational level, and cultural beliefs were also considered significant aspects leading this population to have low participation in this screening behavior. In a similar manner, Seow (17), in research conducted on a multiethnic population of women in Singapore, concluded that cognitive factors such as low perceived susceptibility, cognitive barriers, wrong beliefs about the cost-effectiveness and discomfort, and fear to results were significant aspects that influencing old women's adoption of regular cervical screening. However, environmental factors such as ethnicity, socioeconomic status and educational level were also considered to have a significant impact on the low participation of this group in cervical screening and lack of intentions to be tested by regular Pap smears in the future. Although, the evaluation of the HBM was again very useful for getting a better understanding about the specific cognitions that influenced screening behavior among older women, its predictive value is constrained due to its negligence of important environmental and sociocultural aspects that are strongly related not only to women's behavior but also to women's beliefs about cervical cancer and preventive strategies. Some aspects such as low-exposure to cues of action, history of life, emotions,

and social and physical environmental constrainers (educational level, socioeconomic status, social support, availability of resources) make difficult the assessment of older women's cervical screening behavior exclusively in light of the HBM. For this reason, the necessity for assessing other psychological variables in order to achieve a more accurate and holistic explanation and prediction of old women's screening behavior is evident.

There are different cultural aspects influencing women's decision to participate in cervical cancer screenings. Helman (18) uses the term *cultural explanatory models* (CEMs) to explain the ever-changing emotional meaning and subjective interpretations of the etiology of an illness, nature of symptoms, modalities of treatment and prevention measures in different cultures. The cultural explanatory models for health and illness of Latinas living in the United States are influenced by traditional beliefs of their countries of origin. (19) The construct of acculturation originates from the social sciences and describes the process of exchange experienced as people adapt to a new culture. (20) Berry (21) defined acculturation as the process of psychological and behavioral change individuals and groups undergo as a consequence of long-term contact with another culture. Acculturation as a predictor of health behaviors has had mixed findings in the research literature. Investigators have found that lower acculturated Latina women have less knowledge about Pap smears and exhibit lower utilization rates for cervical cancer screening than women with higher levels of acculturation. (22-24) In addition, Laws (25) found that high levels of acculturation correlate with the number of years lived in the United States; the longer an immigrant has lived in the U.S., the greater the degree of acculturation. These findings suggest that lower acculturated Latina women comprise a subgroup that is at great risk of presenting with advanced stages of cervical cancer. It is evident that culture and acculturation play an important role as predictor of cervical screening in women with different ethnical backgrounds. Since neither the HBM nor other theoretical models incorporate these

variables, it is indeed necessary to take into account their critical role while creating cultural competent strategies to these specific populations.

According to the current risk in which women with different sexual orientation are placed, recent research had confirmed that women who have sex with other women should also have regular Pap smears. This is because several factors such as previous history of sex with men and current sexual behaviors with other women validate their possibility of HPV infection. (26) Due to the fact that women with different sexual orientations might have also different cognitions that influence their active participation in cervical screening programs, recent studies have tried to identify which are the main aspects that influence screening behavior among these populations. For instance, in the study conducted by Prince (27) within a population of 340 lesbians, homosexual, and heterosexual women, they concluded that the most significant finding was reflected in the very low perceived susceptibility of lesbians and bisexual women to get CxCa given their wrong belief that having sex with women did not represent a significant risk to get STDs, or CxCa.

Likewise, another study that was conducted among a population of 512 lesbian and bisexual women by Rankow (28), demonstrated that besides the low perceived susceptibility to get cervical cancer that lesbians and bisexual women have, there are social and environmental aspects such as educational level, socioeconomical status, access to health insurance, and previous history of having been discriminated by health care providers were external variables that could have a high impact in the likelihood of lesbians and bisexual women to have regular Pap smears.

At this point, it is manifested that the applicability of the HBM in determining the specific cognitions that explain and characterize lesbian and bisexual women's cervical screening behavior was effective. However, there are many specific environmental and emotional aspects that limit the accuracy of this

model in explaining screening behavior in a holistic way. Even though physicians, nurses and counselors are considered to have an important role in increasing the possible impact of health and educational strategies in the well being of these women populations, recent research has demonstrated that there are significant homophobic attitudes among health workers. (29) This external variable, for example is not considered into the evaluation of the HBM framework.

According to the information cited above, we could conclude that the applicability of the HBM in explaining and predicting screening behavior was based on its effectiveness in providing health and educational researchers with a general understanding about beliefs and attitudes that might strongly influence the choice of participation or non-participation of different subpopulations of women in cervical screening programs. However, it is very important to bear in mind that behavior is not due exclusively to beliefs and attitudes. On the contrary, behavior is a consequence of the interaction among cognitive, emotional, social, and environmental factors that influence individuals' adoption of specific health behaviors along their span life.

Related to the evaluation of HBM constructs, cues of action such as educational videotapes have demonstrated an important role in cervical screening behavior as far as increasing knowledge related to CxCa, and transforming attitudes and perceptions of the effectiveness of Pap smears. (30) For this reason, it would be worthy for future research to continue focusing on the assessment of the effectiveness of tailored educational material in other groups of women with different sexual orientation, social and cultural characteristics. For example, to produce tailored educational material directed to young women that includes, not only encouraging messages that lead this population to participate in regular Pap smears, but also creative ones that guide them, according to their characteristics, to have safe sex could be helpful strategies that might contribute to decrease the morbidity and mortality for STDs and CxCa.

On the other hand, given that the application of the HBM is restrained by the emotional, social and environmental components that are characteristic in different subgroups of women at risk of getting cervical cancer, it is essential that other variables from different behavioral approaches be taken in to account when health and educational strategies are going to be implemented. Among the variables that should be included in the behavioral analysis of specific populations of women, the efficacy expectations (individual's perceptions about her or his competence to perform a specific behavior) included in the Transtheoretical Model, and the subjective norm variable (normative beliefs and motivation to comply) explained in the Theory of Reasoned Action, might have an important effectiveness in the psychological analysis of women's cervical screening behavior. As a consequence, the evaluation of these other variables might provide a better understanding of the role of physicians, nurses, counselors, friends, and family members in women's decision to participate actively in cervical screening programs from preventing themselves against CxCa. Finally, the social influences explained in the framework of the Social Cognitive Theory might also allow educational and health researchers to assess successfully all the environmental aspects (educational level, socioeconomic status, access to health services, etc) that are strongly relevant to women's cervical screening behavior.

Changing health behavior among any specific population at risk is a huge challenge. However, as long as different health policies and interventions focus on the most possible differences that might exist among women with different social and cultural characteristics, and address beliefs, emotions, attitudes and health-care access barriers, the goal of the different health and educational strategies is going to make a significant contribution to increase the participation in cervical screening and, consequently, decrease the mortality due to CxCa.

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