

Health Belief Model-Based Interventions to Improve Participation of Poor Individuals in Colorectal Cancer Screenings: A Review of Literature for Nurses

ABSTRACT

Colorectal Cancers is the third type of cancer in the world among men, second among women and third among both sexes. Despite Colorectal Cancer early diagnosis practices, which are met free of charge by national cancer screening programs, the participation rates of individuals in screening programs are insufficient; these rates are even lower in poor individuals. Various models have been developed by behavioral scientists to identify and evaluate the factors that affect individuals' participation in cancer screenings. Health Belief Model is one of the most effective models in explaining behaviors towards cancer screening. In the literature, there are studies that try to define the factors that lead individuals to perform colorectal cancer screening on the basis of Health Belief Model. The aim of this review is to show the various applications used on the basis of Health Belief Model to increase the participation of low socioeconomic level individuals in colorectal cancer screening. Nurses should also play a more active role in model-based interventions to increase colorectal cancer screening rates in poor individuals.

Keywords: Poverty, colorectal cancer, early diagnosis, nursing

Mehmet Murat Topaloğlu¹ 
Nihal Gördes Aydoğdu² 

¹ Zonguldak Bülent Ecevit University School of Health Sciences, Zonguldak, Turkey

² Erzurum Technical University School of Health Sciences, Erzurum, Turkey

Introduction

Poverty is the situation in which a people or a certain part of them cannot meet their simplest needs such as food, clothing and shelter that are necessary to maintain their minimum level of living in general.¹ The World Bank considers earning of one dollar per capita as the "international poverty line". The poverty determined according to this threshold is called "income poverty". The inability to meet basic needs such as water and nutrition is defined as "basic need poverty".²⁻⁴ The concepts of absolute poverty according to the minimum nutritional standard and relative poverty determined according to income are generally used in the measurement of poverty in the international literature. Absolute poverty is based on the minimum amount of nutrients or calories that are needed to sustain life. According to the World Bank, people whose daily income is not enough to buy 2400 kcal of food are identified as "absolute poor". Relative poverty, on the other hand, is related to whether the person or household has the minimum standard of living which is recognized by the society in which they live.^{2,4,5}

Poverty is not only defined by low-income level. In the literature, poverty is defined as being deprived of employment, shelter, health services, education and the necessities of social life.²⁻⁴ There is a vicious circle between economic status and health. Poverty causes malnutrition, the frequency of diseases, the allocation most of the income of the individual to the treatment, and a decrease in income. The poverty of the individual whose income decreases, therefore, increases or the individual may become poor while he was not poor. Poverty not only affects health, but also negatively affects the health protection and development behaviors of individuals.⁴

Health promotion aims to enable people to restore their own health and reach their full health potential. Poverty is a negative effect on health protection and improvement behaviors of the individuals. Poor individuals are the group that should be especially dealt with in early diagnosis studies.³ Colorectal Cancers (CRC) are suitable for screening strategies because they are frequently encountered and cause serious health problems and due to presence of precursor lesions (adenoma), growing of tumors relatively slowly, and their allowing time for diagnosis and treatment and further, due the availability of appropriate diagnostic tests to detect the disease. Therefore, early diagnosis is the most effective way to reduce morbidity and mortality in colorectal cancers.⁶

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Corresponding Author: Mehmet Murat Topaloğlu
E-mail: memuratto@gmail.com

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The incidence of CRC cases worldwide is 1.8 million people on average in 2018, and it is stated that the highest incidences are in Asian, European and North American countries, and the lowest incidences are in Africa and Australia. The CRC related mortality was found to be 9% (861.263 people) in 2018 among cancer-related deaths worldwide.⁷ In Turkey, CRC ranks third among cancer types in both men and women, and its incidence is 9.5%.⁸

CRC early diagnosis behaviors of the individuals are insufficient despite the early diagnosis applications provided free of charge by national cancer screening program, these rates decreases much in the poor individuals.⁹⁻¹¹ Studies in the international literature show that low socioeconomic status (low income, unemployment, low education level, lack of health insurance) is associated with a lower rate of participation in screening.¹²⁻¹⁴ CRC mortality rates in the USA are higher among the racial/ethnic minorities with low income who do not have access to healthcare low-income, uninsured due to low screening rates.^{15,16} It has been reported that while the CRC screening rates are quite low in the Appalachian Region, where the poor are the majority in Pennsylvania, the incidence of CRC and cancer-related deaths are quite high.¹⁷ In a study conducted in Malaysia oriented to increase CRC screening in low-income individuals, the knowledge level of individuals about CRC and CRC screening was found to be low.¹⁸

Studies on the participation of poor individuals in CRC screening in Turkey are limited. However, in the findings of some descriptive studies, it was determined that the screening rates of low-income individuals were lower.^{14,19} In a descriptive study conducted for CRC screening in 136 individuals over 50 years of age registered in a family health center; it was determined that 61.6% of the individuals had less income than their expenses, 91.2% did not have screening, 94.1% did not know the age of screening and 79.4% did not know the symptoms of CRC.¹⁹

The purpose of this review is to show various practices used to increase the participation of individuals with low socioeconomic status in CRC screenings with studies. It is expected that the review will shed light on the nursing literature and nurse researchers who will work in this field for individuals with low socioeconomic status.

Colorectal Cancer Screening Programs in the World and Turkey

Screening programs alone are one of the most effective methods in reducing the rate of mortality and morbidity associated with CRC.²⁰ Organized national screening programs that can reach all age groups at risk are implemented in some countries. For instance, while a Fecal Occult Blood Test (FOBT) program is implemented with a regular registration system is applied in France, Spain, Italy and the Netherlands every two years, colonoscopy is performed every 10 years with regular records in Poland and in the UK, both FOBT every two years and flexible sigmoidoscopy programs are performed once. Turkey, USA, Austria, Germany, and Mexico apply these tests with opportunistic programs in which the appropriate environment is provided, but the entire population at risk is not reached.²¹

In the Turkish Cancer Control Plan which was published by the Ministry of Health, Public Health Agency of Turkey, the Colorectal Cancer National Screening Program is applied with a FOBT every two years and optical colonoscopy every 10 years for all individuals aged between 50-70 years. Reminders are made through the coordination of family physicians, Community Health Centers and Cancer Early Diagnosis, Screening and Education Centers through invitation methods to the population to be screened. In addition, these procedures are planned to be applied to high-risk individuals whose first-degree relatives have been diagnosed with adenomatous polyps or CRC, starting from the age of 40.²²

A Model Used to Increase Participation in CRC Screenings: Health Belief Model (HBM)

Models can be an important guide for researchers to evaluate screening behaviors of individuals and to understand how they decide to undergo screening. The HBM, Theory of Justified Action, Theory of Planned Behavior, Social Cognitive Theory, Transtheoretical Model and Health Promotion Model take place among the models/theories frequently used in the literature in evaluating compliance with CRC screening. Although it is stated in the literature that the structures of models/theories are generally effective in predicting CRC screening behaviors, it is indicated that models/theories other than HBM are more limited in predicting these relationships.²³

HBM is a model that examines cancer screenings and other preventive health behaviors. It is a model that explains the effect of health beliefs of individuals on whether or not to undergo screening for cancer. HBM measures willingness of persons to take action to prevent, control or screen disease and identify specific constructs that influence this behavior. For example, if individuals become more susceptible to the negative consequences of CRC, they may perform the screening behavior, understand the benefits of CRC screening, and show less resistance to screening. In addition, individuals may be more willing to undergo screening for CRC if they have cues that encourage screening and believe they can successfully complete the screening on their own.²⁴

According to the HBM, the probability of a person taking action to prevent the disease depends on that such person;^{25,26}

- is aware of the fact that he may also get CRC himself (Perceived sensitivity),
- the consequences of being diagnosed with CRC may be serious (Perceived severity),
- precautionary behavior will prevent the disease effectively and if the screening behavior is performed, the lesions can be removed with early diagnosis before CRC develops (Perceived benefit),
- understands that the benefit of reducing the hazards/risks is much more important than the problems in performing the scanning behavior (Perceived obstacle),
- belief of individual belief in himself while showing the scanning behavior (Perceived self-efficacy).

There are studies evaluating education programs prepared under the guidance of HBM for individuals with low socio-economic status and ethnic minorities. When the literature is examined, model-based interventional studies are limited and poor individuals are mostly evaluated under the heading of different ethnic groups and minorities in interventional studies using HBM. Some experimental studies in the literature are compiled below:

It was investigated by Jerant et al.²⁷ whether an Interactive Multimedia Computer Program designed for HBM-based socio-psychological factors could promote CRC screening in a sample of a certain ethnic group (Hispanic Americans) in the United States. In this randomized controlled study, the intervention group in which the self-efficacy, knowledge, disability, readiness, test preference and experiences related to CRC screening were facilitated through a computer program and the control group in which information was provided without a facilitator were compared. 1164 individuals (49.3% non-Hispanic, 27.2% Spanish/English speaking, 23.4% Spanish/Spanish speaking) involved to the study from 26 polyclinics in five centers were divided into groups based on race and language. As a result of the study, the level of knowledge about CRC screening, self-efficacy perception, and readiness for screening were found to be significantly higher in

individuals who received SIM-based Interactive Multimedia Computer Program compared to the control group.²⁷

In another study, based on the results of two studies conducted to increase the participation of African Americans and Latin Americans in colonoscopy with Patient Guidance method, the factors that enable individuals to have colonoscopy were evaluated within the scope of HBM. In another study, based on the results of two studies conducted to increase the participation of African Americans and Latin Americans in colonoscopy with Patient Guidance method, the factors that enable individuals to have colonoscopy were evaluated within the scope of HBM. Accordingly, as the annual household income of individuals increased (from below \$10,000 to \$50,000 per year at 8 levels), the rates of having colonoscopy also increased. In addition, it was observed that those who scored higher on the Benefits of Colonoscopy Scale had higher rates of having colonoscopy.^{9,28,29}

In another randomized controlled study; African Americans aged 50-80 who were determined to have inadequate health care were reached using the data recording system of 11 different primary care centers in the cities of Louisville and Indianapolis. Participants who agreed to participate in the study were randomly assigned to intervention (computer-facilitated training, n=273) and control (American Cancer Society Brochure, n=283) given routinely in health centers. The participants in the intervention group, whose risk status was determined beforehand, were presented with the training content under the guidance of the computer program, and the appropriate early diagnosis method (FOC test or colonoscopy) was explained. While the scales evaluating the changes between CRC knowledge and HBM scale scores were applied to the intervention group before and one week after the training, they were applied to the control group when the brochure was delivered and one week after the brochure was delivered. After the application of the last scales, the increase in the perceived risk scores ($P = .045$), perceived benefit scores for colonoscopy ($P < .001$) and CRC knowledge scores ($P < .001$) of the participants was found to be higher in the intervention group than in the control group. On the other hand, the perceived obstacle scores of the intervention group in the FOBT decreased more than the control group ($P = .034$).³⁰

In a quasi-experimental design study conducted by Ma et al.³¹ with Korean Americans living in Los Angeles, where Health Belief Model (HBM) was used together with Social Cognitive Theory (SCT); Korean participants registered in six Korean churches were divided into intervention (three churches) and control (three churches) groups. Focus group interviews were made with 16 participants from two different churches outside the study to prepare culturally appropriate educational content within the scope of HBM and SCT for the intervention group in advance of the study. In the light of the information obtained during the interviews, group trainings were organized within the scope of HBM and SCT in churches for the intervention group (n=84). In the training content, subjects such as CRC risk factors, incidence, screening options (benefits of FOBT and colonoscopy), overcoming perceived barriers to action were discussed. Group trainings were organized for the control group (n=83) on prevention from all cancers, prevention of chronic diseases, smoking, nutrition and exercise. In the study in which sub-dimensions of HBM were evaluated with pre-test and post-test, a significant increase was observed in the scores of perceived sensitivity ($P < .05$) and perceived benefit for screening ($P < .001$) in the intervention group. While the CRC screening rate of the intervention group was 77.4 %, this rate was found to be 10.8% in the control group after 12 months of follow-up.³¹

Another similar study in which HBM and SCT-based education was applied was carried out in two cities (intervention and control cities) in Texas where mostly Mexican Americans live. The cities of the inter-

vention and control groups were chosen as similar to each other in terms of the characteristics of the participants (Mexican, low income, etc.). In the training content prepared according to the focus group interview reports, Mexican participants (n=467) in the intervention city were assigned to one of three different intervention groups (lecture presentation, video lecture, or both lecture and video lecture). No application was made to the participants in the control group city (n=317). Scales including CRC knowledge, beliefs, attitudes and behaviors, and screening status were applied to both intervention and control groups. As a result of the six-month follow-up, the rate of CRC screening in the entire intervention group was 80.5%, while the screening rate in the control group was determined to be 17%.³²

In Turkey, there is no intervention study within the framework of the model for the participation of poor individuals in CRC screening. However, there are descriptive studies measuring CRC knowledge levels and health beliefs of individuals at risk regardless of income level.

Conclusion

When the studies conducted in the world are looked at, it is revealed that HBM-based interventions can be effective in increasing the participation of poor individuals in CRC screening. In the HBM-based studies conducted with the poor people, immigrant individuals are generally taken as participants. Poverty, lacking health insurance, low level of education and language problems are among the reasons why immigrants have insufficient access to health services.

There is a need for intervention studies to increase the participation of poor individuals in CRC screening within the framework of behavioral change-oriented models such as HBM by nurse researchers in Turkey. Community health nurses, who have a key role in cancer prevention and early diagnosis, should be employed more in the Cancer Early Diagnosis, Screening and Training Centers of the Ministry of Health. Community health nurses should lead screening programs that reach a large part of the society by optimizing the organizational structure.

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