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An educational strategy for improving knowledge about breast and cervical cancer prevention among Mexican middle school students

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ABSTRACT

Introduction. Prevention programs have not achieved the expected results in preventing mortality from breast and cervical cancer in Mexico. Therefore, we propose a complementary strategy.

Methodology. An educational strategy for high school students in Mexico (2011–2013) was designed (longitudinal design, two measurements and a single intervention). The postintervention assessment included: 1) knowledge acquired by students about cancer prevention and 2) The performance of the student as a health promoter in their household. The strategy was based on analysis of cases and developed in three sessions. An assessment tool was designed and validated (Test–Retest). The levels of knowledge according to the qualifications expected by chance were determined. Wilcoxon test compared results before and after intervention.

Results. An assessment instrument with 0.80 reliability was obtained. 831 high school students were analyzed. Wilcoxon rank-sum test showed a significant learning after the intervention ($Z = -2.64$, $p = 0.008$) with improvement of levels of knowledge in a 154.5%. 49% of students had a good performance as health promoters.

Conclusions. The learning in preventive measures is important to sensitize individuals to prevention campaigns against cancer. This strategy proved to improve the level of knowledge of students in an easy and affordable way.

Introduction

Cancer is the result of the interaction of genetic and environmental factors and is a serious health problem in Mexico (Rushton et al., 2012). In spite of different campaigns on prevention, cervical cancer (CC) is the most frequent, and breast cancer (BC) is the first cause of mortality in women over 25 years old (Torres-Lobatón et al., 2013). In 2012, there were 78,352 deaths due to cancer, and 5663 women died from BC and 3840 from CC (INEGI, 2011a). Mortality from BC increased, from 1199 deaths in 1980 to 4893 deaths in 2009 in women 25 years of age or older, and 86,469 women died from this disease in the last 30 years (De la Vara-Salazar et al., 2011). In ten years (1990–2000), a total of 48,761 deaths were reported from CC; in 1990 there were 4280 deaths, and they increased to 4620 in 2000. Twelve females die daily and women living in rural areas have higher risk of mortality (OR = 3.07) than women in urban areas (Palacio-Mejía et al., 2003).

Regardless of the weight of genetic factors and environment, the more useful resource to control this problem at the population level is prevention (Bray et al., 2012). Within the preventive procedures are the programs of health education and early cancer detection (ECD). ECD program in BC includes breast self-examination, medical examination and mammography screening (Watson-Johnson et al., 2011). CC–ECD program includes Pap smear. While there are campaigns that

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use mass media to invite women to use methods of ECD, most of these women do not attend them for various reasons: fear of cancer, fatalistic views on cancer, lack of knowledge about cancer, linguistic barriers and culturally based embarrassment (Austin et al., 2002). In Mexico, according to the Health Report 2001–2005, the probability of developing BC is 10% (SSA report (Las cuentas en Salud), 2001–2005). Despite this, only 21.6% of women between 40 and 69 years have had a mammogram (SSA report (Las cuentas en Salud), 2001–2005), and only between 5 and 10% of cases are detected in the initial stages of the disease compared with 50% in the US (López-Carrillo et al., 2001). This situation is not exclusive of Latin-America, because countries like India have similar problems (Khokhar, 2012) Hence it is very important to educate people, both men and women, from early stages. It is essential that they know the basic principles of prevention and is also desirable that they participate as health promoters in the family. Therefore, it was a priority concern to design and implement an educational intervention with the following objectives: 1) develop knowledge and skills in students to analyze, address and solve practical problems of health promotion in relation to cancer, and 2) educate students to act as health promoters at home.

Methods

The design was longitudinal with two measurements, one before and one after intervention.

Participants

The study included middle school adolescent students (7–9th grades) from the metropolitan area of Monterrey, in northern Mexico (2011–2013). They participated voluntarily and without remuneration. The institutions were selected at random from the official list of middle schools. Briefly, a 3×3 quadrant division ($n = 9$) was performed on the Monterrey map with the following design: ABC/DEF/GHI. Then, all schools in each quadrant were enumerated serially. A random selection of schools was performed using Minitab program. Students from these schools participated in the educational strategy. After this selection, the remaining schools were sorted to select two other schools. In the first school, three groups (7–9th grades) and 10 students of each group were selected. These students reviewed and suggested modifications to the assessment instrument to make it more understandable. After a second review and the approval of the students, the instrument was applied to 45 students of the second selected school to validate the instrument. The Ministry of Public Education and all the principals of participating schools approved the project. The principals were contacted first, by telephone and the visits were scheduled. Before the intervention, mothers or legal guardians of the students signed informed consent forms to allow their children to participate.

Educational strategy

We used an educational strategy that promotes student participation to construct their own knowledge and to solve practical problems in relation to health promotion and cancer prevention. The strategy can be applied by teachers, nurses, or health workers and consists of three sessions. In the first one, the study is contextualized, emphasizing its importance and pre-intervention measurement is performed using the assessment tool designed and validated by the authors. In addition, students received an illustrated brochure to be read at home that included the basics of risk factors, prevention and general measures to be taken in case of abnormalities. Also, a reading guide was supplied (Annex). After reading the text, the student should answer all guide items arguing the reason for each answer.

Both, the reading guide and the instrument had a similar format. The response options were “true” or “yes” if the student agreed with the statement, “no” or “false” if he disagreed and “don't know” if he could not decide. Besides the brochure, a survey addressed to the student's mother was given. It consisted of 42 questions investigating the general demographics of women, gynecological and obstetric history and knowledge about breast and cervical cancer. The mothers' responses to the questionnaire were used for other research. For purposes of this work, it was considered that the student performed his (her) work as health promoter if he (she) returned the mother's questionnaire fully answered by his (her) mother or legal guardian. Students were instructed to answer their study guide by themselves, and bring it the next meeting, as well as bringing the mother's questionnaire for the third session. The second session was a plenary meeting where the students analyzed and discussed the reading guide under researcher direction. In the third and final session, the post-intervention measurement took place and the mothers' questionnaires were collected.

Instrument design

A knowledge assessment tool about the prevention of breast and cervix cancer was designed based on short clinical cases that explored the knowledge about risk factors, etiology and preventive measures of these two pathologies (Annex). Three physicians with expertise in cancer prevention and education made the initial design. There were two rounds until the agreement among the three experts was obtained. The instrument was then submitted to the evaluation of a group of three teachers from the Ministry of Education, in charge of health promotion activities. The adjustments proposed by the panel of expert teachers were made. Subsequently, the instrument was applied to a pilot group of 30 students to refine the material from the standpoint of understanding terminology. After obtaining an instrument accessible and easily understood by the student, it was subjected to validation. The final instrument consisted of 44 questions distributed in 4 cases (2 BC and 2 CC) and 3 types of responses, true (+1), false (−1) and don't know (0). The questions explored knowledge about risk factors (1–5, 14–17, 28–31, 37–40), decisions making about prevention of the disease (6–13, 18–20, 32–34, 41–44), identification of physical abnormalities suggestive of cancer (21–24) and making decisions about the need for a medical evaluation (25–27, 35–36).

Instrument validation

The instrument was applied to a different group of 45 students selected randomly from a general list of 500 students using the package MINITAB version 20. Eleven men (12.91 ± 0.83 years) and 34 women (13.31 ± 0.91 years) participated. The Test–Retest (Williams et al., 1992; Perez Padilla and Viniegra, 1989) was applied to the 1980 (questions × pupils = 44 × 45) responses obtained “before” and the 1980 obtained “after” (a week later and no intervention).

According to the authors, “in order to calculate the distribution of correct answer and the difference between correct and incorrect answers (core), we use a method based on a Gaussian distribution. The distribution of scores expected by chance is approximated by a Gaussian distribution with a mean of zero and a standard deviation equal to $\sqrt{n(pA + pE)}$. The distribution of the total number of correct answers has a mean of npA and SD = $\sqrt{npApE}$, where n is the total number of questions, and pA and pE are probabilities of having a right or wrong answer, respectively. The formulae are applicable to questions false/true/do not know and to the more common type of one correct in five options. Once the chance distribution is known, it can be compared with the distribution of scores or correct answers obtained, which can then be used to separate people in two groups: those answering the test as expected or worse than expected by chance, and those than answer the text better than expected by chance. The first group should not be passed. The passing of individuals in the second group can be decided by additional criteria” (Perez Padilla and Viniegra, 1989).