RESEARCH ARTICLE

Process Evaluation of the First Computer Tailored Program for Smoking Cessation among Romanian Smokers

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Abstract

The objective of this paper is to present the implementation and process evaluation of the first computer tailored program for smoking cessation among Romanian smokers. The program targeted adult smokers who declared the intention to quit smoking in the next six months. The intervention consisted of a letter tailored to several respondent characteristics: gender, cognitive variables (attitude, social influence, and self-efficacy), intention to quit smoking, goal and relapse prevention strategies (action and coping plans), and smoking behaviour. The first 80 participants entered into the program filled in a process evaluation questionnaire one month after the intervention. The results of our study confirmed that the participants had read and remembered the letter. Moreover, new for Romania, this approach was positively appreciated by the participant and the score received for the tailored letter was high. The opinions of the participants confirmed that the tailored letter provided information that was useful, trustworthy and relevant for the individual. At the same time, the participants appreciated the polite, easy to understand content of the letter. These data underlined the premises for continuing the program and for using the information and communication technologies for healthy lifestyle promotion among Romanian population.

Keywords: Smoking cessation - computer tailored health education - Romania

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Introduction

Smoking is an important public health problem worldwide (World Health Organization, 2012; Lotrean et al., 2013; Gupta and Kumar, 2014; US Department of Health, 2014). The World Health Organization Framework Convention on Tobacco Control underlines the importance of developing actions for helping smoking cessation as a part of a comprehensive tobacco control national plan (World Health Organization, 2013).

In order to stimulate and aid smokers to quit, many different smoking cessation interventions have been developed and tested in different countries, such as face to face counselling of the person by a qualified health education professional, self-help materials, mass-media campaigns (Lancaster et al., 2000; Lancaster and Stead, 2005; van Keulen et al., 2011; Jayakrishnan et al., 2013; Kim et al., 2013; Paek et al., 2014; US Department of Health, 2014).

Current research in health communication and education for smoking prevention and cessation and healthy lifestyle promotion has identified the benefits of matching health messages to relevant characteristics of individuals, potentially boosting the effects of these messages on the targeted health behaviours. Tailored health interventions employ a combination of information and behaviour change strategies that are unique to that person, related to the outcome of interest and derived from an individual assessment (Lancaster and Stead, 2005; Rimer and Kreuter, 2006; Hawkins et al., 2008; van Keulen et al., 2011). Advances in information and communication technologies have facilitated tailoring through the use of sophisticated computer algorithms, allowing the creation of highly individualized messages that can address each individual's unique needs, motivations and beliefs related to the health behaviours being targeted (Civljak et al., 2010; Krebs et al., 2010). The rising cost of healthcare presents also compelling argument for developing innovative health education and communication strategies aimed at improving health outcomes among different segments of the population using a wide array of information technologies (Smit et al., 2013).

In the last years, many efforts were done to develop more and more tailored messages and health education programs through the use of information technology, since several studies showed that tailoring messages for each individual can be more effective than presenting generic information in terms of motivating individuals, building their self-efficacy and improving health behaviours

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(Lustria et al., 2009; Brouwer et al., 2011; McDonell et al., 2011; Schulz et al., 2012; Lustria et al., 2013). Rimer and Kreuter define tailoring as a process for creating individualized communications by gathering and assessing personal data related to a given health outcome in order to determine the most appropriate information or strategies to meet that person's unique needs. Tailored materials require at least: (1) a ''diagnosis'' at the individual level of characteristics that are relevant for a person's health behaviour or illness; (2) a ''message library'' that contains all health education messages that may be needed; (3) an ''algorithm'', a set of decision rules that evaluates the diagnosis and selects and generates messages tailored to the specific needs of the individual user; and (4) a ''channel'' to deliver these messages to the user in an understandable, clear and attractive manner (Rimer and Kreuter, 2006). Three main possibilities of assessing the target group characteristics and delivering of the messages were used: email, web page based instant questions and answers, and personalized letters sent by normal mail (the tailoring was made by using special computer software, but the feedback was sent by mail). The last possibility could be more useful for special conditions where the use of computers and internet is not very popular as well as for target groups with lower literacy and skills in using the information technology (Lotrean et al., 2009).

Despite of the strengths of computer tailored programs for health promotion, no such a program addressing smoking cessation or other health related behaviours was yet implemented in Romania. This limit the access of Romanians to cost-effective tailored counselling for smoking cessation and health promotion.

The objective of this paper is to present the implementation and process evaluation of the first computer tailored program for smoking cessation among Romanian smokers.

Materials and Methods

Recruitment of participants

This study was approved by the Ethics Committee of the University of Medicine and Pharmacy from Cluj-Napoca, Romania. The inclusion criteria for the paticipants in the study were: (1) adults 18-60 years old living in Romania. (2) being smoker (smoked at least once in the last week). (3) having declared intention to quit smoking in a period of a maximum 6 months. (4) offering informed consent to participate in the study. (5) filling in a questionnaire with several questions regarding socio-demographic characteristics and smoking related opinions and behaviour.

The recruitment was performed mainly in two counties-Cluj and Alba- from North-West Romania. Participants were recruited between September 2013 to May 2014 through advertisements on the web page of the program, local newspapers, distribution of flyers and posters in general practices, hospitals and pharmacies as well universities and student campuses. General practitioners from Cluj and Alba counties were also invited to help the recruitment process by presenting to their patients who come for medical visits the smoking cessation program.

The participants could register on-line. After registration, they received a login code and were asked to fill out the online baseline questionnaire (T1). Alternatively, the smokers could fill in a pen and paper questionnaire received from their general practitioners or from the research team, filled in and returned it and the research team entered the data in the on-line system. Respondents who indicated that they had not smoked during the past 7 days or were not willing to quit within 6 months were excluded from further participation. Based on the information from the questionnaire, they received a feedback letter with personalised messages in a period of maximum two weeks. One month after receiving the personalised letter, the first 80 participants in the program were also asked to fill in a short questionnaire (T2), which evaluated their opinion about the letter. The persons who filled the first questionnaire on-line were invited through one e-mail to fill on-line the second questionnaire. In case of no answer from the study subjects, another e-mail was sent one week after. In case that the persons did not fill in the second questionnaire, they were contacted by phone and asked to answer the questions from the questionnaire. The persons, who filled the pen and paper first questionnaire, were contacted by phone to answer to the second questionnaire.

Characteristics of the computer tailored smoking cassation program

The tailored intervention was based on previously developed computer-tailored smoking cessation interventions (Diskstra et al., 1998; Te Poel et al., 2009; Smit et al., 2012) while the I-Change model served as the theoretical framework (De Vries et al., 2003). A library with messages which might be needed was created. After filling in the questionnaire, feedback messages were selected from the library of messages developed previously based on the characteristics of each participant. Feedback messages were tailored to several respondent characteristics (Diskstra et al., 1998; Te Poel et al., 2009; Smit et al., 2012): gender, cognitive variables (attitude, social influence, and self-efficacy), intention to quit smoking, goal and relapse prevention strategies (action and coping plans), and smoking behaviour. Feedback messages were combined into one personalized 9 to 11 pages letter. The letter was sent by email to the participants. For smokers who filled in the pen and paper questionnaire and no email address was available/used the letter was sent by post. The letter consisted of several components: (1) introduction which included participant's name and reinforcement of the specific intention to quit. (2) feedback on the respondent's attitude (perceived advantages [pros] and disadvantages [cons]) toward smoking and quitting smoking. The messages were stressing the advantages of quitting, such as personal health consequences, social consequences (e.g. appreciation of quitting by a non-smoking partner) and the consequences of smoking for people in the social environment. The letter was also giving information with regard to the possible negative outcomes of quitting, such as weight gain, loss of functions of smoking (such

as relaxation) and expected withdrawal symptoms, underlying the temporary character of most of the expected negative outcomes and their mechanism. (3) feedback on perceived social influence (not) to smoke, (4) feedback on the respondent's reported self-efficacy to refrain from smoking in specific situations, including suggestions on how to cope with these situations. The letter focused on enhancing confidence in quitting by offering skills to cope with social, emotional and addictive situations which had been helpful to ex-smokers. For example, skills were addressed to cope with social pressure and the loss of the smokers' image, with stress, anger and depressed mood, and with withdrawal symptoms and craving. In the case of an individual having low self-efficacy to refrain from smoking in a certain situation, specific skills to be used in that situation were offered. In the case of an individual having high self-efficacy to refrain from smoking on all items with regard to a particular domain, e.g. social situations, this received a positive feed back and it was reinforced. (5) feedback on the extent to which respondents were planning to undertake specific actions (action plans) while preparing their quit attempt. (6) feedback on how to cope with certain difficult situations (coping plans), including the formulation of personal plans in the shape of if-then statements. (7) information about nicotine replacement therapy for smoking cessation which do not need medical prescription as well as information regarding the web page where they can get information about physicians who can help them with medical advice and medication for smoking cessation. (8) ending.

Instruments for data collection

The first questionnaire (T1) included several questions regarding socio-demographic characteristics and smoking related attitudes, social influences, self-efficacy, behaviour and intention to quit smoking. The variables include in this study are : age, gender (1=male, 2=female), rural/urban residence, educational level (1=low: secondary school/ basic vocational school, 2=medium: high school degree, 3=high: college degree/university degree), ethnicity (1=Romanian, 2=non-Romania), and the occurrence of cardiovascular, respiratory diseases and diabetes (1=no, 2=yes). Smoking behaviour (number of cigarettes smoked per day) and intention to quit smoking (1=within 1 month, 2=within 3 months, 3=within 6 months) were also presented.

In order to perform the process evaluation of the programme, the second questionnaire (T2) assessed if the participant read the tailored letter and if they remember its content. Several 5 point scale questions (-2 I totally disagree, -1 I disagree, 0-I do not know, 1-I partially agree, 2-I totally agree) assessed the understand ability, personal relevance, credibility, and perceived applicability of the received information. Finally, respondents were asked to assign a grade between 1 and 5 for the information they received. The content of the questionnaire was based on previous studies (Te Poel et al., 2009).

Analyses

Data analysis included basic descriptive statistics of the respondents with regard to socio-demographics, smoking related behaviour and intention to quit smoking. Mean age of the participants was also calculated. Logistic regression was performed to compare participants which filled in the second questionnaire with participants who drop out the study.

There were calculated means and standard deviations for all the items related to participant' opinion about the program

Data analysis was performed with SPSS-20 statistics programme. Significant results are reported at $p<0.05$

Results

Characteristics of the participants

The sample consisted of the first 80 participants age 20-60 who beneficiated of the tailored letter which aimed to help them to quit smoking. The mean age of the sample was 34.3 (SD=9.8) years. Table 1 presents that around two thirds of participants were males, while around 80% of the participants were from urban areas. The majority of the participants had medium or high level of education.

Table 1. Characteristics of the Participants (N=80)

Items		Percentage
Gender	Female	38.8%
	Male	61.2%
Living environment	Urban	78.8%
	Rural	21.2%
Ethnicity	Romanian	93.8%
	Other	6.2%
Educational level	Low	3.8%
	Medium	41.2%
	High	55%
	Respiratory diseases	10%
	Cardio-vascular diseases	13.8%
	Diabetes	5%
	Diseases of osteoarticular system	8.8%
Number of cigarettes-smoked/day		
	<10	42.5%
	10-20	50%
	21-30	5%
	31-40	2.5%
	>40	0%
Intention to quit	Next month	33.8%
	Next three months	38.7%
	Next six months	27.5%

Table 2. Participants' Opinions about the Program (N=65[1])

Items	Mean	Standard deviation
I remember the content of the letter [2]	1.7	0.4
The letter was interesting [2]	1.5	0.6
The letter contained new information [2]	1.2	0.8
The letter contained useful information [2]	1.7	0.6
The letter was understandable [2]	1.7	0.5
The letter reflected my own opinion [2]	1.2	0.6
The letter was related to my own situation [2]	1.3	0.7
The content of the letter was credible [2]	1.6	0.6
The content of the letter was trustworthy [2]	1.7	0.6
The letter was annoying [2]	-1.6	0.8
The letter was boring [2]	-1.5	0.9
The tone of the letter was polite [2]	1.7	0.5
Overall evaluation of the letter [3]	4.6	0.6

[1]Out of the 80 participants included in the study only 65 answered to the process evaluation questionnaire (T2); [2]Posibilities of answer (-2)- I totally disagree to (2)-I totally agree; [3]Grades varied between 1 (low evaluation) to 5 (high evaluation)

With respect to smoking behaviour, the majority of participants were smoking up to one package of cigarettes/day. One third of the smokers declared that they want to quit smoking in the next month, around 39% declared the intention to quit smoking in the next three months and the rest of the sample in the next six months.

The participants found out about the program from posters/informations received in health care institutions (33.6%), pharmacies (13.7%), university or university campus (6.3%), from newspapers (21.3%), friends/acquaintance (12.5%), the web page of the program (6.3%) and members of the research team (6.3%).

Out of the 80 participants included in the process evaluation, 65 filled in the second questionnaire. The attrition rate was 18.7%. The participants who did not fill in the second questionnaire did not differ significantly in terms of socio-demographics characteristics or intention to quit smoking from those who filled in the evaluation questionnaire.

Participants' opinions about the program

All subjects who filled in the process evaluation questionnaire (T2) declared that they have read the tailored letter and remembered the content of the letter. Table 2 shows that participants rated the letter positively. The highest scores were offered for the items related to the fact that the letter contained useful as well as credible and trustworthy information and the letter was written in a polite, easy to understand manner. The items related to personal relevance and the novelty of information got also positive, but a bit lower scores. The participants generally disagreed with the fact that the letter was annoying and boring.

Discussion

In several countries from the world, especially from North America and Western Europe computer based tailored programs were used in several locations, such as schools, primary care institutions, hospitals, workplaces, home, community based centres and addressed several health behaviours such as nutrition and physical activity, smoking and alcohol abuse. Their results showed that computer tailoring is a product of a complex process and its characteristics and effects are influenced by a number of moderating variables, including: (a) location of delivery (b) health behaviour, (c) type of participant population, (d) type of material, (e) number of intervention contacts, (f) length of follow-up, and (g) demographic factors, behaviours, and theoretical concepts used for tailoring (Lustria et al., 2009; Shahab and McEven, 2009; Brouwer et al., 2011; McDonell et al., 2011; Schulz et al., 2012; Lustria et al., 2013). Several computer tailored programmes for smoking cessation developed in countries from North America and Western Europe show promising results, but more research is needed in order to better understand which concepts are essential to stimulate behavioural change for a particular behaviour and for particular segments of the population (Lustria et al., 2009).

This study presents the implementation and process evaluation of the first computer based tailored health education program for smoking cessation from Romania. The program succeeded to enrol participants of both genders and different ages from 20 to 60 years old, but the participants were mainly from urban areas and had medium or high educational level. Different studies underline that the use of computers and internet in Romanian is still behind other European countries and there are still big differences between rural and urban area, even though the use of information technology is spreading more and more in some rural areas too. (Lotrean et al., 2009; Eurostat, 2012). Moreover, several studies also underline that persons from rural areas and low educational level have lower addressability to general practitioners and weaker possibilities of getting information about the health promotion and health care programmes they can beneficiate (Center for Health Policies, 2007; Eurobarometru, 2012). Future interventions should focus more on getting and motivating persons from disadvantaged groups to participate. The program enrolled more men than women, but this is also probably a consequence of the fact that in Romania smoking is still more prevalent among men than women (Center for Health Policies, 2007; Eurobarometru, 2012).

The tailored letter used in the program for personalised counselling for smoking cessation aimed to a personal and direct content presentation based on elements such as likes/dislikes, needs, and current smoking related behaviour and behavioural intentions. The results of our study underlined that the participant have read and remembered the letter. Moreover, even new for Romania, this approach was positively appreciated by the participant and the score received by the tailored letter was high. The opinions of the participants confirmed that the tailored letter succeeded to adjust the information to the individual's situation and provided information that was useful, trustworthy, applicable and relevant for the individual. At the same time, the participants appreciated the polite, easy to understand content of the letter. These increase the chance of continuation and use of the program in the future.

The results underline the importance of continuing the smoking cessation program. Its continuation will facilitate and increase the access of Romanian smokers to smoking cessation tailored counselling and their chance of quitting smoking, increasing their health and quality of life. Health professionals, such as general practitioners and pharmacists, are in the position to provide interpersonal counselling. Previous research shows that advice from physicians and pharmacists is an effective intervention to help people stop smoking (Lancaster et al., 2000). However, the involvement of physicians and pharmacist from Romania in providing smoking cessation counselling is low, because of lack of time, skills and financial reimbursements (Yarnall et al., 2003; Center for Health Policies, 2007; Eurobarometru, 2012). Consequently, interventions in primary care that require only minimal input from health professionals are more likely to be implemented. Tailored interventions using computer technology which are recommended to patients by physicians, such as the computer tailored

program presented in this paper, fit this description. Future studies should focus on finding ways to motivate the health care providers to recommend the smoking cessation program to their patients.

This study is subject of several limitations. Similar with other studies (Diskstra et al., 1998; Te Poel et al., 2009; Smit et al., 2012), around 19% of the participants did not fill in the process evaluation questionnaire and the results are based only on self reported data. The intervention did not provide medical treatment, only counselling, but it offered information about way they could get more medical advice and help.

In conclusion, this study shows that the first computer tailored smoking cessation program was positively appreciated by the participants, which offer the premises for continuing the program and for using the information and communication technologies for healthy lifestyle promotion among Romanian population. Countries which are in the beginning phase of using computer tailoring for health education could take advantage of experience and interventions previously developed and tested in other countries with more expertise in this field.

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