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### **THE USE OF INFORMATION TECHNOLOGY FOR SMOKING CESSATION: OPINIONS OF ROMANIAN PATIENTS FROM GENERAL PRACTITIONERS**

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# The Use of Information Technology for Smoking Cessation: Opinions of Romanian Patients from General Practitioners

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## Abstract

The objectives of this study are assessing of internet use among Romanian patients from general practitioners as well as their intention to use or recommend the first computer tailored program for smoking cessation from Romania. The study involved 200 patients from general practitioners from Cluj-Napoca, Romania. A cross-sectional study was performed in 2014 through anonymous questionnaires. More than 80% of the patients declared using internet, while half were searching on internet in the last month information regarding healthy lifestyle. The prevalence of smoking was 29.5%. One out of two smokers declared intention to try the program for smoking cessation, this intention being higher among smokers with a stronger intention to quit smoking in the next 6 months, having email-address and searching healthy lifestyle information on internet in the last month. Two thirds of the participants agreed that they would inform other persons about the smoking cessation program; this intention was higher among women and among those interested in healthy lifestyle information on internet. Information technology

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could be use for healthy lifestyle promotion among patients from big cities of Romania, where internet access and interest for computer tailored programs for health promotion look promising.

*Keywords:* internet use, computer tailored program for smoking cessation, Romanian patients, social media.

## Introduction

The interest of the public, scientific and medical community as well as health policy stakeholders in the use of the internet for the goals of prevention, promotion and protection in health-enhancing strategies has grown considerably (De Rosis & Barsanti, 2016; De Ruijter *et al.*, 2017; Ware *et al.*, 2017). Internet provides a new source of health knowledge for people, including healthy lifestyle related information and education such as smoking prevention and cessation, promotion of a healthy nutrition and an active lifestyle (De Ruijter *et al.*, 2017; Ware *et al.*, 2017; Lustria *et al.*, 2009; Lustria *et al.*, 2013). Access and use of online healthy lifestyle related information has the potential to provide an alternative/additional channel for information as well as empowerment and higher chances for persons of different ages, socio-economical and educational background to improve their lifestyle and health (De Ruijter *et al.*, 2017; Ware *et al.*, 2017).

## Literature review

Recent estimates have shown that more than 4.1 billion people use the internet worldwide, with older adults representing the group with the highest rates of increase in the past decade in several regions (Internet World Stats, 2017; Tennant *et al.*, 2015). Greater access to the internet has increased the availability of health information, but several studies underline that many internet users continue to face challenges accessing relevant and literacy-sensitive health and medical content that is of high quality (De Feo *et al.*, 2012; Solomon, Wagner & Goes, 2012; Bidmon & Terlutter, 2015; Steele *et al.*, 2014). Nevertheless, in several countries, such as Romania, relatively little is known about interests, preferences, availability and capacity to identify and access credible and relevant sources of information, education and counselling for healthy lifestyle promotion among different population groups (Lotrean *et al.*, 2009; Nădășan *et al.*, 2018).

Smoking represents an important problem of public health and the World Health Organization calls for comprehensive actions of tobacco control, including appropriate help for smokers to quit (World Health Organization 2012; World Health Organization 2013). Different studies from Romania underline the necessity

of developing and implementing programs for quitting smoking for different population groups, including patients with several chronic diseases (Pascal *et al.*, 2017; Trofor *et al.*, 2016; Lotrean *et al.*, 2013). The development of innovative programs for smoking prevention and cessation through the use of information and communication technology might play an important role in initiating and maintaining positive behaviour changes with important consequences on health and well being of people (Rogers *et al.*, 2017; Shahab & McEwen, 2009). They have the advantage of being easily accessed by participants with access and skills in using computers and internet. At the same time, this approach reduce the burden on the health systems, preventing the overload with health education activities the medical doctors, who many times declare they do not have enough time for counselling with regard to healthy lifestyle promotion, including quitting smoking (Rogers *et al.*, 2017; Shahab & McEwen, 2009; Civljak *et al.*, 2017).

A Cochrane review underlines that that some internet-based interventions can assist smoking cessation at six months or longer, particularly those which are interactive and tailored to individuals (Civljak *et al.*, 2017). In comparison with generic information, tailoring messages for each individual has the potential to better motivate, increase self-efficacy and improve several health related behaviours (Smit, de Vries, Hoving, 2012; Smit *et al.*, 2013; Te Poel *et al.*, 2009; Hawkins *et al.*, 2008). Development of personalised computer based smoking cessation programs implies several steps: (1) development of tools which allow identification of individual characteristics influencing smoking behaviour for each person ; 2) creation of a collection of health education messages that may be needed in different situations; (3) development of a set of decision rules that based on the assessed individual characteristics selects from the health education messages those which are more appropriate for the participating person; and (4) the messages are delivered to the participating person in a way which is understandable, clear and attractive (e.g. instant messages, emails)( Rimer & Kreuter, 2006).

A computer tailored smoking cessation program for adults was developed in Romania (Lotrean *et al.*, 2014). The tailored intervention was based on previously developed and tested computer-tailored smoking cessation interventions from Western Europe and was guided by the I-Change model theoretical framework (Smit, de Vries, Hoving, 2012; Smit *et al.*, 2013; Te Poel *et al.*, 2009; De Vries *et al.*, 2003). It represents the first computer tailored for smoking cessation from Romania. This approach is new for Romania and the feasibility of its implementation, including interests, motivation or barriers of Romanian adults in using the program should be evaluated.

The objectives of this study are assessing of internet use among Romanian patients from general practitioners as well as their intention to use or recommend the first computer tailored program for smoking cessation developed in Romania.

## Methodology

### *Study design and sample*

A cross-sectional study was carried out in April 2014 in 10 general practitioners (GP) offices from different neighbourhoods of Cluj-Napoca, a city with more than 300 000 inhabitants, situated in the North-West part of Romania. In each general practitioner's office 20 patients aged 18 to 60 were randomly selected from the patients coming for different issues to the GP. In each office out of the 20 patients 10 were men and 10 were women and for each sex half of the patients were between 18 and 35 years, while half were between 36 and 60 years of age.

The patients were asked by a member of the research team to fill in an anonymous questionnaire and were informed that the participation is voluntary. The refusal rate was 16%, patients who refused to participate being replaced with patients of the same gender and age category from the same GP office. The final sample of the study consisted of 200 patients from general practitioners from Cluj-Napoca (100 women, 100 men; 100 aged 18-35 and 100 aged 36-60); the educational level of the participants was as following: 40.5% junior high school or high school studies, 59.5% at least university studies. The study is part of a research project which received the ethical approval of the Ethic board of University of Medicine and Pharmacy from Cluj-Napoca, Romania.

### *Instruments for data collection*

The patients were invited to participate in a study investigating the use of internet for health education. The participated patients received explanations and a leaflet with information about a computer based smoking cessation program. They were informed that the program is developed by specialists from University of Medicine and Pharmacy from Cluj-Napoca, Romania and Maastricht University and has the objective to offer personalised counselling for smoking cessation for smokers who intend to quit smoking in the next 6 months. They received also information about the procedure regarding registration and participation: (1) Participants can register on-line on the web page of the smoking cessation program; (2) After registration, they receive a login code and are asked to fill in an online questionnaire assessing smoking related knowledge, attitudes, self-efficacy, behaviour as well as intention and plans for smoking cessation; (3) Based on the detailed information from the questionnaire, they will receive on e-mail a feedback letter with personalised messages which has the purpose to offer them information, tips, guidance which might help them in the process of smoking cessation as well as information about smoking cessation centres where they can receive further help, if needed.

After the presentation of the computer based smoking cessation program, the participated patients were asked to fill in an anonymous questionnaire. It assessed

several socio-demographic issues such as age, gender, educational level as well as their use of computers and internet searching behaviour (having a computer at home, using a computer, using internet and time spent per day on internet, having e-mail, having social media account, searching internet in the last month for lifestyle related information such as nutrition, physical activity, smoking prevention and cessation. It investigated also the smoking behaviour by asking the participants if they smoked during the lifetime, in last month and last week, while the smokers were also asked about intention to quit smoking in the future. Smokers were considered those declaring smoking in the last week.

Other issues investigated by the questionnaire were intention of smokers to use the computer based smoking cessation program and reasons for doing this (the real need to get counselling for smoking cessation, it looks interesting, it seems trustful, the fact that the information are delivered via e-mail) or not doing this (they don't want to quit smoking, they prefer face to face counselling, they do not trust it can help or do not use internet). At the same time, all the participants were asked about their intention to recommend the program to other persons who are smokers.

### *Statistical analyses*

Prevalence of the investigated issues were assessed and chi<sup>2</sup> tests were used to compare men and women as well as people aged up to 35 years of age and those older than 35 years. Pearson bivariate correlations were used to assess association between intention to use the computer based smoking cessation program among smokers (0=no, 1=yes) and several variables- age, gender (0=man, 1=woman), educational level (1=low: secondary school/ basic vocational school, 2=medium: high school degree, 3=high: university degree), using internet (0=no, 1=yes) and time spent per day on internet (0=maximum 2 hours, 1=more than two hours), having e-mail (0=no, 1=yes), having social media account (0=no, 1=yes), searching internet in the last month for lifestyle related information (0=no, 1=yes), intention to quit smoking in the next 6 months (0=no, 1=yes).

At the same time, Pearson bivariate correlations were used with the aim to identify among the whole study sample the association between intention to recommend the smoking cessation program for other smokers (0=no, 1=yes) and several variables-age, gender (0=man, 1=woman), educational level (1=low: secondary school/ basic vocational school, 2=medium: high school degree, 3=high: university degree), using internet (0=no, 1=yes) and time spent per day on internet (0=maximum 2 hours, 1=more than two hours), having e-mail (0=no, 1=yes), having social media account (0=no, 1=yes), searching internet in the last month for lifestyle related information (0=no, 1=yes). According to Cohen, strong correlation was considered at  $r > 0.50$ , while medium and small correlation was considered at  $r > 0.30$  and  $r > 0.10$ , respectively. Data analysis was performed with SPSS-20 statistics programme. Significant results are reported at  $p < 0.05$ .

## Results

### *Computer use and internet searching behaviour*

Table 1 show that the majority of the participants have computers at home and use computers, while 82.5% of them declared using internet, but less than 30% spent more than 2 hours/day on internet. Around 80% of the sample subjects have e-mail and two thirds of the sample has a social media account. One out of two subjects declared searching on internet in the last month for healthy lifestyle related information. No statistically significant gender differences were found, except the fact that women were more likely than men to search for lifestyle related information in the last month. On the other hand, people younger than 35 years of age were more likely to use computers and internet, to spend more time on internet, to have e-mail and social media account, while no age differences were found with regard to searching internet for lifestyle related information (see Table 1).

Table 1. Computer use and internet searching behaviour: age and gender differences

	Total %	Men %	Women %	P value*	Age 18-35 years %	Age 36-60 years %	P value**
Have a computer at home	93.5	96	91	>0.05	95	92	>0.05
Using computers	83	86	80	>0.05	95*	71	<0.001
Using internet	82.5	85	80	>0.05	95*	70	<0.001
Spending >2 hours/day on internet	29	32	26	>0.05	38*	20	<0.01
Having e-mail	80.5	84	77	>0.05	95*	66	<0.001
Having social media account	65	62	68	>0.05	87*	43	<0.001
Searching for healthy lifestyle related information	57	49	65	<0.05	62	52	>0.05

\*- comparing men and women at  $\chi^2$  test

\*\* - comparing subjects up to 35 years of age and those older than 35 years at  $\chi^2$  test

*Smoking behaviour and intention to use or recommend the computer tailored smoking cessation program*

The results show that 29.5% of the participants were smokers, being noticed statistically significant differences between smoking prevalence among women (23%) and men (36%), while no statistically significant differences were found with regard to smoking prevalence among patients younger than 35 years (30%) and those who were older than this age (29%). Among smokers 45.7% declared their intention to quit smoking in the next six months, without to be noticed statistically significant differences between male (41.6%) and female ( 52.2%) smokers or between the two age groups (40% and 51.7%, respectively).

Half of the smokers (49.1%) said that they would be interested to try the computer tailored program for smoking cessation. The main reasons for the intention to try the smoking cessation program were the following: the real need to get counselling for smoking cessation (34.5%), it looks interesting (55.2%), it seems trustful (44.8%), the fact that the information are delivered via e-mail (37.9%). Smokers who did not want to use the program declared that they decided this because they don't want to quit smoking (53.3%), they prefer face to face counselling (33.3%), they do not trust it can help (16.6 %) or do not use internet (13.3%). The results of the bivariate correlation show that intention to use the program was higher among smokers with a stronger intention to quit smoking in the next 6 months, among those who have email-address and were searching healthy-lifestyle information on internet in the last month (see *Table 2*). Two thirds of the participants agreed that they would inform other persons about the smoking cessation program; this intention was higher among women and among those interested in looking healthy-lifestyle information on internet (see *Table 2*).

*Table 2. Factors associated with intention to use or recommend the smoking cessation program-results of the bivariate correlation analyses*

Items	Intention to use the programme*	Intention to recommend the programme*
Age <sup>a</sup>	-0.018	-0.016
Gender <sup>b</sup>	0.162	0.320
Educational level <sup>c</sup>	0.186	0.125
Using internet <sup>d</sup>	0.139	0.040
Time spent on internet <sup>e</sup>	0.163	0.030
Having e-mail <sup>d</sup>	0.373	0.013
Having social media account <sup>d</sup>	0.068	0.040
Searching for lifestyle related information <sup>d</sup>	0.482	0.201



Intention to quit smoking in the next 6 months <sup>d</sup>	<b>0.714</b>	
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\*-Pearson correlation coefficients (*r*) are bolded for statistically significant results ( $p < 0.05$ ); age expressed in years; 0=man, 1=woman; 1=low: secondary school/ basic vocational school, 2=medium: high school degree, 3=high: university degree); 0=no, 1=yes; 0=maximum 2 hours, 1=more than two hours

## Discussion

Traditionally, healthcare professionals are the patients' main and most reliable source of health-related information, including information for healthy lifestyle promotion (De Ruijter *et al.*, 2017). The use of internet opened new opportunities for healthy lifestyle promotion, but different studies underline that age, sex, residence, socio-economical and educational background and current technology use influence the individuals' uptake of these opportunities (De Ruijter *et al.*, 2017; Ware *et al.*, 2017; Lustria *et al.*, 2009; Lustria *et al.*, 2013; Kreps, 2010; European Commission, 2014). Over the past several decades, inequities in internet availability and accessibility have diminished due to technological advances and lower-cost access to broadband internet (European Commission, 2014).

eHealth, refers to “the use of emerging information and communications technology to improve or enable health and health care”( European Commission, 2012). By addressing the holistic needs of patients eHealth technology can advance health care from a disease-centred to a patient-centred model through their ability to support improved access, continuity, communication, shared decision-making, and patient self-management (Zulman *et al.*, 2015). The eHealth Action Plan 2012-2020 of the European Commission identified the lack of awareness of eHealth opportunities and challenges for users as one of the barriers to wider uptake of eHealth solutions and proposed to support activities aiming at increasing citizens' digital health literacy (European Commission, 2012).

Our study investigated computers use and internet searching behaviour for healthy lifestyle information of Romanian patients from Cluj-Napoca, a big city from North-West Romania. The results underline that more than 80% of the participants use computers and internet and have e-mail, while more than two thirds of them have a social media account. No gender differences were found with regard to this issue. People below the age of 35 were statistically significant more likely to use computers, internet and have e-mail account (95%) and social media account (87%), but more than two thirds of people with the age more than 35 years are also using computers, internet and e-mail communication, while around 40% have a social media account.

A study performed in countries from European Union (EU) shows that overall, at EU level, eight out of ten respondents (80%) have used the Internet for private purposes within the last 12 months (European Commission, 2014). Around six out of ten (59%) have done so every day or almost every day on average, while 15% used it 1-3 times a week and 6% used it 2-3 times a month or less. Only one person in five (20%) has never used the internet (European Commission, 2014). The countries with the highest percentage of respondents who declared the use of internet over the last 12 months were the Netherlands (94%), Denmark (92%) and Sweden (92%). On the other hand, the lowest percentages of internet use in the last 12 months were found in Romania (65%), Slovenia (70%) and Bulgaria (71%) (European Commission, 2014).

Data offered by Romanian Institute of Statistics show that a 61% of the households in Romania have access to the internet at home, almost 67% of them being located in urban areas. In the Bucharest-Ilfov region (the location of the capital of Romania), more than three out of four households have access to the internet, followed by the Romanian regions from West, North-West, Center, South-West Oltenia, and South-Muntenia. The North-East (53.2%) and South-East (54.1%) regions register the lowest share of households with access to the internet (Popescu, 2017).

A study performed at European level shows that around six out of ten people have used the Internet to search for health-related information, while a percentage of 59% declared the use of Internet to search for health-related information within the last 12 months; of these, 10% have done so once a week or more, 9% several times a month, 13% approximately once a month, and around a quarter (27%) have used the Internet less than once a month to search for health-related information. The countries with the highest percentages of people who have used the internet to search for health-related information within the last year (at least seven out of ten) were the Netherlands (73%), Sweden (70%) and Denmark (70%). On the other hand, Romania (47%) and Malta (49%) are the only countries in which less than half of the respondents declared they have used the Internet for this purpose (European Commission, 2014).

The results of our study also show that more than half of the participants were searching on internet in the last month for lifestyle related information, with women being statistically significant more interested about this (around two thirds of the participants), while no differences were found between the two age groups. Similar with studies from other countries, this proves the need for the development of easy to use, engaging, and accessible programs delivered through the use of internet that communicate the right information needed to guide healthy lifestyle promotion for Romanian population (De Rosis & Barsanti, 2016; De Ruijter *et al.*, 2017; Ware *et al.*, 2017).

Around 29% of the participants were smokers and around half of them declared intention to quit smoking in the next six month, showing the importance of

targeting smokers with smoking cessation programs they can access easily in order to increase their motivation, skills and commitment to quit smoking. The data from Eurobarometru show that the prevalence of smoking among Romanian adult population is 28%, but only 2% of the ex-smokers or smokers who tried to quit smoking have accessed medical support or stop smoking resources such as quit-lines (European Commission, 2017). In Romania there is a national program for smoking cessation offering a quit line and centres for medical counselling and treatment for smoking cessation, but the limited funding of the program limits the access of smokers to appropriate advice and help (Trofor *et al.*, 2016).

Based on the experience from Western European countries, a computer tailored smoking cessation program for Romanian adult smokers was recently developed in Romania (Smit, de Vries, Hoving, 2012; Smit *et al.*, 2013; Te Poel *et al.*, 2009; De Vries *et al.*, 2003). This approach has the potential to influence smoking cessation among Romanian smokers, but because of its novelty in Romania, its feasibility and acceptance was investigated by the present study.

## Conclusion

The results show that half of the smokers declared their intention to try the smoking cessation program, the reasons for doing so relying on both their desire to receive help for smoking cessation as well as the impression created to them by the presentation of the program, the program being considered interesting, trustful and easy to be accessed because of its internet based approach. No age or gender differences were found with regard to intention to use the program, showing it might be attractive for both women and men of different ages. People who intend to quit smoking in the near future are more likely to take advantage of smoking cessation resources and programs and, as expected, the persons who declared their intention to quit in the next 6 months declared a higher intention to try the computer tailored program for smoking cessation (Smit *et al.*, 2013). The reasons declared by smokers for not using the program was mainly the fact that they did not want to quit smoking and to a less extent the fact that do not like its approach or do not use internet.

Moreover, two thirds of the whole sample declared that they would recommend the program to other smokers. No age differences were found with regard to this issue, but women were more likely to declare that they would promote the program among other smokers.

Having an email address increases the chance that smokers declare intention to use the program, while searching on internet for lifestyle related information in the last month was statistically significant associated with both intention to use and intention to recommend the program.

This study is subject of limitations. It included a limited sample of patients from general practitioners from one big city of Romania, so the generalization of results beyond its sample is not possible. The information was obtained through a short anonymous questionnaire and relies on the data declared by the participants.

Nevertheless, the study is one of the few studies focusing on internet use and its potential use for personalised programs for health promotion among Romanian patients, since the feasibility and acceptance of this approach is important for health policy development.

### *Recommendations*

Based on the results, the following recommendations are proposed:

- 1) The computer based smoking cessation program developed in Romania is a feasible approach which has the potential to increase access of Romanian smokers to appropriate advice for smoking cessation. Future studies should investigate ways of promoting the program among smokers, including ways to motivate the health care providers to recommend the smoking cessation program to their patients.
- 2) Information and communication technology could be used for enhancing healthy lifestyle promotion among Romanian patients, at least in big cities of Romania, where internet access and interest of population for computer tailored programs for health promotion look promising.
- 3) Development, implementation and evaluation of programs for healthy lifestyle promotion using information and communication technology should receive attention and appropriate funding from health care professionals and policy makers.

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