

THE YIELD OF USING INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) FOR HEALTH, TARGETING SMOKING, ALCOHOL AND NUTRITION: A SYSTEMATIC REVIEW

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Abstract: *To evaluate the effectiveness of Information and Communication Technologies for health (eHealth) behavioural interventions aiming to improve smoking rates, alcohol intake and nutrition behaviours, this systematic review was undertaken. Randomized trials were included. Six electronic databases were searched for randomized control trials, published in English from April 2000 to April 2017 and evaluating eHealth interventions; the studies we evaluated include young adults (18-35 years) participants, from 37 studies included. Systematic review demonstrated a significantly lower mean number of drinks consumed/week compared to control.*

Key words: *alcohol, smoking, ICT, systematic review*

1. Introduction

The World Health Assembly in resolution WHA58.28 (2005) acknowledged that eHealth is the cost-effective and secure use of ICT in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research. In the last decade, a growing interest by countries in this issue was observed and eHealth's increasingly ubiquitous role in health care [31].

Smoking, risky alcohol use and poor diet quality are modifiable risk factors of chronic conditions, such as cardiovascular disease, stroke, cancer and diabetes [6].

Occurrence of these modifiable risk factors during young adulthood can influence chronic disease morbidity in later life [4], [5].

A lot of young adult's lifestyle behaviours are adverse. 34% of men and 21% of women aged 22-25 years from the developed countries are current smokers [3].

Cardiovascular disease is a leading cause of premature death and disability worldwide. Ehealth interventions have particular potential among young adults due to their high level of use of technology. Therefore, eHealth combines the use of technologies, such as internet and smartphones to facilitate behaviour

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change and improve health [19], [25], [30].

There exists interdependence between alcohol consumption and smoking, demonstrated in many studies until now. A genetic determinism was incriminated [9]

Young adults who smoke are four times more likely than non-smokers to use alcohol, eight times more likely to use drugs, and 22 times more likely to use cocaine. Smoking is associated with a host of other risky behaviours, such as fighting and making unprotected sex [14].

Usually, people who drink alcohol, they often smoke and vice versa. There are several mechanisms that may contribute to concurrent alcohol and tobacco use, including some genes involved in regulating certain brain chemical systems; neurobiological mechanisms, such as cross-tolerance and cross-sensitization to both drugs [1], [2].

The importance of genetic influences on both alcoholism and smoking has gained widespread recognition over the last decade. Using behavioural genetic methods, such as twin and adoption studies, as well as genetic epidemiological approaches, researchers have established that both alcoholism and smoking have strong heritable components [7, 8].

The relative contributions of genetic and environmental risk factors may depend on a person's age and gender [15], [17]. Thus, one study found that the combined risk for alcohol use and smoking in adolescents was primarily attributable to shared environmental features (e.g., peer influences) whereas in young adults, this risk was significantly influenced by genetic factors [8].

Several neurobiological mechanisms may underlie the strong relationship between alcohol and tobacco use. Both the ability of one drug to reduce the effects of the other drug (i.e., cross-tolerance) and the ability of one drug to increase the effects of the other drug may play

important roles in mediating this relationship [12], [16].

Components of the brain signalling system involving the neurotransmitter dopamine may play a role in the genetic basis for both alcohol and tobacco addiction. One brain system that uses dopamine as a primary neurotransmitter is the mesolimbic dopamine system, which has been involved in the motivation to obtain various rewards, including alcohol and nicotine [10].

2. Methods

2.1. Eligibility Criteria

The participants were defined as being aged 18 to 35 years.

Interventions: eHealth behavioural interventions with the primary aim to improving: smoking, alcohol intake and nutrition. (eHealth interventions included those that used websites, computers, including: laptop, e-mail, mobile/ smart phones, digital games and/or monitoring devices as a component of the behavioural intervention.

Comparators: Any comparators or controls.

Outcome measures: Any measures to assess effectiveness of interventions of any of the smoking, nutrition and alcohol risk behaviours.

2.2. Literature Search

We searched databases like EMBASE, PsycINFO, Cochrane, Science Citation Index up to march 2017. Intervention study or randomized controlled trials were included.

2.3. Results' Synthesis

Results are presented in a narrative summary.

3. Results

There were included twenty-six studies focused on alcohol intake, seven on smoking and one for nutrition. In the USA, 7 studies were made for smoking, 25 for alcohol; in Australia- 1 study for nutrition and in The Netherlands-1 study for alcohol.

Ehealth interventions versus control, for smoking cessation: Three studies reported greater smoking abstinence in e Health interventions compared to controls for at least one outcome, and time point. Participants in a 30-week web and email-based interventions reported greater 7 and 30-day smoking abstinence rates at 30 weeks compared to a control group; there were no between-group differences at 30 weeks for smoking abstinence of 6 months or greater. Higher quit rates were demonstrated in a 6-week text message and web based intervention, compared to a control group after 6 weeks, but there was no difference between groups in verified quit status after 15 weeks found greater 7-day point prevalence abstinence among participants in a one-off web-based smoking cessation session, compared to a control group after 4 weeks. After 26 weeks, the web-based group had higher rates of 30-day abstinence than the control group.

Effectiveness of eHealth nutrition

interventions: Kothe et al (2014) compared a 4-week email intervention to a control group, and found no significant difference to a control group, and found no significant difference in fruit and legumes consumption after 1 month. Effectiveness of eHealth alcohol interventions: Seventeen studies to a control group, twelve studies involved a one-off session of a web or computer-based intervention [28], that provided participants with feedback on their current alcohol intake, compared to a control group. Nine of the 12 studies found higher reductions in alcohol consumption in the intervention group compared to control. Of the remaining five studies, three compared eHealth interventions to control groups. Neighbors et al. (2009) used text messages to encourage individuals to drink in moderation on their 21st birthday. The intervention group reported lower estimated blood alcohol concentration the week of their birthday compared to controls. Suffeleto et al., found greater reductions in binge drinking days in a group receiving text messages with feedback, compared to a control group, after 12 weeks. Mason et al (2014) did not find any difference between a 4-day text -message intervention and control group for a number of alcohol consumption related measures.

Study characteristics per behaviour and in total

Table 1

		Total	Smoking	Nutrition	Alcohol
Year of publication	2005-2009	16	2	0	14
	2010-2015	18	5	1	12
Number of participants	10299	10299	1827	162	8240
sex	Female%		53.1	83	53.3
	Male%		46.9	17	46.7
Intervention duration in weeks			22	4	3.8

Two studies compared eHealth intervention to an attention control group and found no difference in heavy drinking episodes after 22 weeks, between participants in a one off web-based session intervention that provided feedback on alcohol intake or feedback on sleep, exercise and diet. Neighbors et al. (2010) compared four web-based interventions that provided either gender specific or neutral feedback on alcohol consumption as a one-off exposure or bi-annually. The attention control group received access to a web program unrelated to alcohol, without feedback [19], [20], [21], [24]. There was no difference in drinks/week or frequency of heavy between groups at 26 weeks but, at 52,78 and 104 weeks, feedback reported a lower number of drinks.

4. Discussions

This systematic review infuses that eHealth interventions are typically more effective than control groups in asserting behaviour change in the short-term. The strongest evidence exists for very brief web or computer-based interventions targeting alcohol consumption, where young adults are provided with personalized feedback on their current level of alcohol intake compared to recommended levels. Our systematic review found a significantly lower mean number of drinks consumed per week in the intervention group compared with controls. These results are consistent with two recent reviews of brief interventions for reducing alcohol consumption among college students [18], [30] and would be sufficient to generate clinically meaningful health benefits including a reduction in the risk of a lifetime attributable death from a chronic alcohol-related disease [26]. Therefore, due to their positive impact of alcohol intake, and the potential benefits, brief eHealth interventions with

personalized feedback about alcohol intake should be considered as a public health approach to reducing alcohol consumption among young adults.

All studies that compared eHealth to other non eHealth delivery modes revealed no significant difference in behaviour change between the two modes. Given the potential benefits of eHealth interventions are the broad population reach and, cost efficacy compared to traditional delivery modes, if behaviour change is equivalent, eHealth interventions may be a more scalable option. A research priority therefore is the comparison of eHealth interventions to other treatment modalities (face to face or by telephone) to determinate which is most effective in achieving improvements in smoking, alcohol and nutrition outcomes among young adults, as well as which is more cost effective, and has the greatest reach and adherence.

5. Conclusions

This review provides some evidence for the short-term efficacy of eHealth smoking, nutrition and alcohol interventions for young adults, particularly for the use eHealth alcohol interventions. Further research however is required to investigate longer-term performance of the interventions, as well as what intervention modality is more effective.

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