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Telehealth-delivered group smoking cessation for rural and urban participants: Feasibility and cessation rates

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ABSTRACT

Background: Large-group behavioral smoking cessation interventions are effective for helping people quit smoking, but have not been evaluated using videoconferencing technology for rural and remote participants who have no access to in-person cessation programs. The objectives of this study were to provide and evaluate an evidence-based group smoking cessation program for rural/remote smokers wishing to quit through a Telehealth videoconferencing link at their local Health Centre.

Methods: From September 2005 through April 2008, eight separate eight-session, 4 month long smoking cessation group programs were offered both in person to urban participants in Calgary and at up to six rural sites simultaneously via Telehealth videoconferencing. Quit rates were assessed at program completion, 6 and 12 month follow-up. Participants also provided evaluations of the program and technology.

Results: 554 smokers participated in the program: 370 in Calgary and 184 at various remote sites. Sixteen Telehealth sites participated from across Alberta and one site from the Northwest Territories. After program completion, continuous abstinence rates using the most conservative intent-to-treat method were 27.5% in Calgary and 25.5% for the rural Telehealth sites. Quit numbers were much higher using only Available Data at 39.2% for Calgary and 37.2% for the rural sites. Similar rates were maintained over the 12-month follow-up. Program evaluations were positive.

Conclusions: It is possible to offer effective smoking cessation to small groups of patients in rural or remote locations through Telehealth videoconferencing technology, which produces quit rates similar to in-person groups.

1. Introduction

Smoking continues to be the number one preventable cause of death worldwide (Andrews, Heath, Harrell, & Forbes, 2000). Although the prevalence of smoking in Canada has decreased from 47% in the 1970s, 17% of the Canadian population still smoke (Health Canada, 2009). Likewise, in the United States 20.6% of the population 18 and older were smokers in 2009 (Centers for Disease Control & Prevention, n.d.). In addition, the worldwide prevalence of smoking is on the rise, especially among women and in developing countries (World Health Organization, 2002). Smoking is associated with many adverse health consequences including elevated risk for coronary heart disease, high blood pressure, high cholesterol (LDL), emphysema, pneumonia, ulcers, tooth and gum disease, osteoporosis, sleep problems, and Grave's disease, among others (World Health Organization, 2002). Smoking has also been implicated in lung, mouth, throat, larynx, pancreas, kidney, cervix, and bladder cancers (Health Canada, 2009; World Health Organization, 2002). According to the World Health Organization (World Health Organization, 2002) smoking-related diseases kill one in ten adults world-wide, causing five million deaths annually. If current trends continue, tobacco-related deaths will double and reach close to 10 million people by 2020 (World Health Organization, 2002).

Although many smokers report a desire to quit, the success rate of unassisted quitting is estimated at 7.33% (World Health Organization, 2002), highlighting the need for smoking cessation interventions. A systematic review evaluating the effectiveness of smoking cessation programs concluded that the combination of behavioral and pharmacological interventions is twice as effective as placebo pharmacologic interventions alone (Andrews et al., 2000). Moreover, there is stronger support for intensive intervention programs than for moderate

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interventions with fewer contact hours or no interventions (Andrews et al., 2000). Guidelines for effective smoking cessation interventions include the following components: assessment of willingness to quit, four or more sessions that are more than 10 min in length over a minimum of a two week period, utilization of clinicians with different backgrounds (psychologists, nurses, physicians, social workers, etc.), individual or group or telephone counseling with special focus on problem solving and skills training, incorporation of a social support component, relapse prevention intervention and nicotine replacement therapy (Anderson, Jorenby, Scott, & Fiore, 2002; Andrews et al., 2000; Fiore et al., 2000).

Randomized controlled trials of various smoking cessation interventions for healthy populations demonstrate quit rates ranging from 2 to 34% for individual counseling, 5–39% for group interventions, and 2–30% for telephone based interventions (Mottillo et al., 2009). A Cochrane review found group behavioral therapy to be the most effective cessation strategy (Stead & Lancaster, 2005).

The group behavioral smoking cessation program offered through the Tom Baker Cancer Centre (TBCC) in Calgary, Canada has been previously described and shown to be effective (Bultz, Scott, & Taenzer, 1988; Carlson, Goodey, Bennett, Taenzer, & Koopmans, 2002; Carlson, Taenzer, Koopmans, & Bultz, 2000; Carlson, Taenzer, Koopmans, & Casebeer, 2003). The program has been offered to the general public, TBCC patients, hospital staff, and volunteers since 1984. Over 6000 smokers have enrolled in the program. The program utilizes a large group format facilitated by two clinical psychologists over eight, 90-minute sessions, and is based on cognitive–behavioral techniques, incorporating most of the recommendations from published guidelines cited above. The three-month success rates of quitting in the program were reported as follows: 40% between 1986 and 1990 (Carlson et al., 2000), 41.5% between 1996 and 1999 (Carlson et al., 2002) and 39.5% between 1992 and 1999 (Carlson et al., 2003). Data collected from 2069 program participants between 1992 and 1999 showed that the strongest predictors of smoking status at 3 months were severity of nicotine dependence on the Fagerstrom test, being married or in common law relationship, and being a family member of a cancer patient (Carlson et al., 2003).

Recently several technological applications for smoking cessation have been developed. Those applications have been grouped as internet or web-based, telephone-based or video-based (Jennett et al., 2003). Walters, Wright, and Shegog (2006) reviewed 19 studies that utilized computer or internet-based interventions. The interventions included mailing out general information about smoking and smoking cessation, mailing untailored letters and tailored letters based on baseline information collected online. Seven of 15 studies with adults reported improved cessation among treated subjects as compared to untreated controls at the longest follow-up (Walters et al., 2006). A more recent review of 22 RCTs of web- or computer-based smoking cessation programs found a relative risk of 1.44 in intervention versus control groups (Myung, McDonnell, Kazinets, Seo, & Moskowitz, 2009). Hence, smokers were 44% more likely to quit using these programs than on their own. The authors concluded that there is sufficient clinical evidence to support the use of web- and computer-based smoking cessation programs for adult smokers.

Telephone-based and text-messaging interventions have also proven effective. A Cochrane review of 27 randomized controlled trials of telephone smoking cessation found that telephone counseling was more effective than minimal interventions with an overall odds ratio of 1.56 (Stead, Perera, & Lancaster, 2006). However, telephone counseling alone was generally not as effective as face-to-face individual counseling.

Despite a growing number of internet and telephone-based interventions, very few reports of videoconferencing smoking cessation interventions exist. The CableQuit program was based on a community cable TV program with telephone call-in (Valois, Adams, & Kammermann, 1996), and another small study utilized videoconference links for smoking cessation in a rural First Nations community (Johnston, Atwell, Johansen, Ho, & Thommasen, 2003). The CableQuit program consisted of 13 sessions covering material on smoking cessation which were broadcast over an 8-week period. After the presentation of didactic material, participants could call into the studio to ask specific questions. Fifty-eight smokers participated, with 15% quitting at 6-weeks, 22% at 6-months, and 17% at 1 year (Valois et al., 1996). The only study to use videoconferencing technology was a descriptive report of one session of smoking cessation provided to 6 participants in a First Nations community, but no cessation outcomes were reported (Johnston et al., 2003). No more recent applications of videoconferencing technology for smoking cessation could be found, with the exception of one description of training smoking cessation program facilitators through videoconferencing in Australia (Mitchell, Hawkshaw, Naylor, Soewido, & Sanders, 2008).

Given the geographically dispersed nature of the Alberta population and the availability of province-wide videoconferencing equipment, it was proposed that the evidence-based TBCC group smoking cessation program should be offered via videoconferencing to remote and rural smokers who would otherwise not have access to this type of service. The province of Alberta encompasses an area of 661 848 km^2 with a population of approximately 3 million people. The majority of the population (approximately 2 million people) live in or near two urban centers: Edmonton in central Alberta and Calgary in southern Alberta. The remainder of the population is sparsely distributed throughout the province. Optimum health service delivery, including smoking cessation, over this large region remains a challenge. In 2005, the TBCC smoking cessation program via Telehealth videoconferencing technology was introduced to address this issue of access to appropriate cessation services.

2. Methods

2.1. Participants

All subjects were participants of the smoking cessation program offered through the TBCC, Calgary, Canada either in person or via Telehealth videoconference in various remote sites across the province of Alberta, between September 2005 and April 2008. Participants were recruited to the program through referrals from family physicians and center staff as well as self-referral via promotional pamphlets, websites, newspaper articles, word of mouth and other media coverage of the program. The cost of the program was $100 for the general public and $25 for patients with a diagnosis of cancer, and for Alberta Cancer Board and Health Region employees.

2.2. Measures

2.2.1. Demographic and smoking history

General demographic variables (e.g., age, marital status, education), health information (e.g., height and weight, daily exercise, and pre-existing health conditions), and smoking history (e.g., number of smokers in the home, number of cigarettes per day, and age started smoking) were assessed. A Pack-Year of smoking is defined as the equivalent of twenty cigarettes (one pack) smoked every day for one year.

2.2.2. Fagerstrom Test for Nicotine Dependence (FTND)

Physical dependency on nicotine was measured using the FTND (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) which is calculated by summing responses to six factors: time to first cigarette, ability to refrain from smoking in forbidden areas, cigarettes smoked per day, smoking when ill, early morning smoking, and which cigarette would be most difficult to give up. Scores range from 0 to 10, with higher scores indicating more dependence on nicotine. The FTND has acceptable test–retest reliability and internal consistency, and its