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Outcomes of a One-Time Telephone Intervention for Smoking Cessation in Adults

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Abstract

Tobacco use is the single greatest cause of disease and premature death in America today. To address this major public health concern, states are required to provide smoking cessation services. The purpose of this article is to examine the effectiveness of a one-time telephone adult smoking cessation program designed by a certified addictions registered nurse–advanced practice and conducted over an 11-month period by the State of Nevada. Specifically, the program included a telephone-based counseling session and distribution of a 2-week supply of nicotine replacement therapy patches. The sample population consisted of 1471 Nevada residents, men and women, aged 18 years and over who called the Quitline for smoking cessation help. All participants in the program provided consent for a follow-up call to report on their quit rates and satisfaction with the intervention at 7 months postintervention. Although everyone who participated in the interventions was called, only 373 (25.4%) were actually reached via telephone contact. Of this group, quit rates showed that 34.6% reported continuous abstinence at 7 months, whereas 35.1% were abstinent at the 7-day point prevalence and 31.9% were abstinent at the 30-day point prevalence. Patient satisfaction with the program revealed that 77.6% ($n = 373$) of the participants reported being very or mostly satisfied. This program evaluation study shows that short-duration telephone counseling plus nicotine replacement therapy was associated with helping at least one third of the participants to quit using tobacco for all of the prevalence points—7 and 30 days and at 7 months postintervention.

Keywords: smoking cessation program, telephone-based counseling, Tobacco Quitline

Tobacco is the single greatest cause of disease and premature death in America today, and it is responsible for an average of 440,000–480,000 deaths annually (Koh & Sebelius, 2012; U.S. Department of Health and Human Resources, 2009). The World Health Organization predicts that, by the year 2030, tobacco dependence will be the direct or indirect cause of eight million deaths globally (World Health Organization, 2012). Tobacco use, specifically smoking, damages almost every organ of the human body and, as a result, leads to many chronic diseases that diminish the overall health of a smoker (Center for Disease Control and Prevention [CDC], 2012b). Fortunately, the prevalence of adult smoking has gone down from 43% in 1964 to 19% in 2010 (Koh & Sebelius, 2012). However, cessation rates for adult smokers remain low (CDC, 2014) as, once a person becomes addicted to nicotine, this behavior is difficult to stop with or without current treatment modalities. For this reason, tobacco use and dependence are still major public health concerns.

According to the Surgeon General's Report, almost all tobacco users initiated smoking at an early age, and thus, 88% of the current daily adult smokers reported smoking by the time they have reached the age of 18 years (CDC, 2012c). The earlier the smoking initiation age, the harder it is for one to quit (CDC, 2012c). An integrative review of the risk and protective factors for onset of smoking in youth and adolescents reveals that nonsmokers understand the significant health risks from smoking and do not perceive any advantages associated with this behavior. Those teens who do begin smoking perceive that it increases popularity—especially if friends smoke—and reduces stress. They also frequently perceive that it is easy to stop smoking and that nicotine is not very addictive (Arens, White, & Massengill, 2014). Obviously, these important attitudinal findings suggest the need for increased public

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health education of youth if we are to meet the *Healthy People 2020* goal of reducing smoking behavior to 12%. Thus, reducing tobacco use remains a high public health priority, and all states are required to provide some form of tobacco cessation services (Puckett et al., 2015).

The CDC recommends that each state provide a Quitline or telephone-based tobacco cessation program (CDC, 2014). Quitlines are well established and provide a public health-oriented approach to smoking cessation work (Niaura , Shadel, Britt, & Abrams, 2002).

However, like many other public health programs, Quitline services in many states have been reduced by budget cuts. This situation in Nevada was the impetus for designing a brief telephone counseling session and distribution of a 2-week supply of nicotine replacement therapy (NRT) patches and a packet of self-help smoking cessation materials. The purpose of this article was to examine the efficacy of this intervention related to participants' satisfaction with the program and reported abstinence from cigarette smoking 7 months later.

BACKGROUND

For many years, long-term tobacco consumption has killed more individuals than many other high profile conditions and behavioral risk factors such as alcohol use and dependence, AIDS, car crashes, illegal drugs, murders, and suicide combined (Steinberg, Schmelzer, Richardson, & Foulds, 2008). Smoking is also the strongest predictor of dental disease when risk factors related to sociodemographics are controlled (Griffin, Barker, Griffin, Cleveland, & Kohn, 2009). The oral–systemic connections of poor oral health—often caused or exacerbated by smoking—are now associated directly in multiple chronic conditions, but especially coronary artery disease and diabetes mellitus (Sheiham & Watt, 2000).

Literature indicates that Quitlines are effective for smokers who use them, and these services play a vital role in media-based efforts to expand outreach services and increase quit attempts among the general population (CDC, 2014). A study on the Quitline programs, which examined the effects of single versus multiple counseling sessions, found that 12-month quit rates for individuals who received only self-help materials were 5.4%, followed by 7.5% for a single-telephone counseling and 9.9% for those who received multiple counseling sessions (Zhu et al., 1996). This situation suggested that multiple counseling sessions did not significantly increase the quit rate yield.

A randomized controlled trial (RCT) using one behavioral counseling session and smoking cessation medications for daily smokers being treated by five Veterans Affairs medical centers found that cessation rates were higher for the experimental telephone group than for those in routine primary care, which served as the control (An et al., 2006). Their 6-month abstinence at the 12-month follow-up point prevalence showed a 13% quit rate for the telephone group versus 4.1% for the primary care group.

Another RCT used an Internet-based smoking cessation program as the intervention and found a 24.1% cessation rate at 90 days for the treatment group versus 8.2% for the control group. However, when data from those who did not complete the follow-up surveys were analyzed using an intention-to-treat model, the quite rates dropped to 12.3% for the treatment group and 5% for the control (Swartz, Noell, Schroeder, & Ary, 2006).

In summary, the quit rates from various smoking cessation programs are difficult to compare as programs differ in number of counseling sessions, use of pharmacological measures, and types of delivery systems. However, it appears that most programs do show some success at helping people quit smoking—especially for those who call in or are otherwise seeking help to quit.

CIGARETTE SMOKING IN NEVADA

Nevada has come a long way as it once had the highest mortality rate of 478.1 per 100,000 populations, resulting in one of the highest percentages of deaths from smoking at 24% (CDC, 2010a). The current prevalence rate of smoking in Nevada is 22.2%, and more than 428,000 residents are reported to be current smokers (CDC, 2010b), slightly higher than the national average of 20% (World Lung Foundation, 2010) and almost twice as high as the *Healthy People 2020* target of reducing the smoking rate to 12% (CDC, 2012b). *Healthy People 2020* objectives TU-9 and TU-10 have called for an increase in tobacco screening as well as cessation counseling in healthcare settings (Silfen et al., 2014). Neighboring states such as Utah (9.3%) and California (13.7%) have reached or are about to reach the *Healthy People 2020* smoking prevalence target (CDC, 2010a).

The state of Nevada has a smoke-free law that allows partial protection against second-hand smoke exposure in public places (CDC, 2010a). However, recent data from the 2010 Tobacco Control State Highlights Report presented by the CDC indicated that, from 2000 to 2004, there was an average of 3300 deaths that occurred in Nevada each year because of tobacco use. This yielded a 343.7 per 100,000 rate for smoking-attributable mortality that ranks 49th in the nation (CDC, 2010a). Although Nevada has not reached the *Healthy People 2020* target of reducing the burden of smoking to 12%, the state has and continues to take measures that will help it advance to reach that goal.

As of 2014, Nevada ranked 40th in the nation for tobacco prevention funding and spends far below the 30 million dollars recommended by the CDC per year (Nevada Tobacco Prevention Coalition [NTPC], 2014). Despite collecting $164,000,000 in tobacco-generated revenue from the Master Settlement Award payments and tobacco tax revenues, the state only allocated $1,000,000 for smoking prevention and cessation programs and services (American Lung Association, 2014; Nevada Cancer Coalition, 2014; NTPC, 2014).

The state of Nevada Quitline started operations in 1997 and provides free comprehensive, statewide nicotine dependence treatment and education to eligible Nevada residents (Fildes & Wilson, n.d.). Services at the Quitline include (a) information regarding nicotine dependence treatment and tobacco use cessation, (b) cessation referrals and resources

for providers, and (c) telephone-delivered reactive and proactive counseling. Although Quitline services vary across states, the state of Nevada Quitline once offered longer and more intensive proactive counseling protocols, with many tobacco users receiving treatment for a year or more. During funding reductions, it was necessary to consider less intensive interventions to continue access to services. Consequently, the new model of Quitline smoking cessation that included only one telephone session, 2 weeks of NRT, and a self-help booklet was designed.

THE ROLE OF COUNSELING

Smoking cessation is one of the best public health strategies because it is a cost-effective and safe way to help people reduce tobacco use (Hogan, Dall, Nikolov, & American Diabetes Association, 2003). Most cigarette smokers want to quit. However, it is hard for them to do so without proper support and understanding of the existing treatment options (CDC, 2014; Steinberg et al., 2008). Counseling approaches have greatly enhanced public health efforts to combat many healthcare problems, especially those that are linked to the concept of addiction such as compulsive eating, nicotine dependence, alcohol use and dependence, and compulsive gambling.

THE ROLE OF MEDICATION

Smoking cessation medications increase the odds of successful quitting when utilized effectively as compared with nonmedication cessation efforts (Feigenbaum, 2010; Selby, 2008).

The first-line recommended medications that increase the chances of long-term abstinence rates are nicotine gum, bupropion (Zyban), nicotine lozenge, nicotine inhaler, nicotine patch, nicotine nasal spray, and varenicline (Chantix; Fiore et al., 2008; Steinberg et al., 2008; Tonstand, 2009). A combination of medications is recommended just as counseling and medication are recommended over either method alone (Selby, 2008; Sherman, 2005; Steinberg et al., 2008).

Feigenbaum (2010) suggests that all people trying to quit smoking should be empowered by their healthcare providers to select a pharmacological aid that meets their treatment needs.

Zyban and Chantix require prescriptions and have potential side effects that must be monitored. Most importantly, they should not be used by people with known suicidal ideation or depression. All of the NRTs act by reducing cravings and withdrawal symptoms but have differences in their potential adverse effects. Consequently, patients need considerable information about these medications to make the best treatment choices (Feigenbaum, 2010). Mode-of-delivery methods for the NRT also differ and might influence adherence to use. Also apparent is the need to counsel patients that withdrawal symptoms from nicotine peak within 24–48 hours after smoking cessation and are heightened during the 7- to 21-day time frame. During this period, many people experience negativity, problems with concentration, and physical cravings (Feigenbuam, 2010), hence the need for prior counseling of patients to anticipate and treat these symptoms that can precipitate relapse.

The Stage of Change theory has been used to assess if smokers are ready to adhere to smoking cessation medications especially during the preparation stage (Prochaska, Teherani, & Hauser, 2007). During the preparation stage, smokers are required to set a quit date that falls within the next 30 days, and counselors are encouraged to provide medications that will help them get started with their quit efforts.

METHODS

The purpose of this study is to determine the effectiveness of a one-time telephone smoking cessation counseling intervention, plus a 2-week supply of NRT patches with instructions for use and a smoking cessation self-help booklet. The study included a secondary data analysis of data collected from participants who used the State of Nevada Tobacco Users Helpline. Participants received a nurse-designed counseling session that was holistic in nature and included physical, emotional, mental, and spiritual effects of nicotine dependence. Hence, a drug dependency treatment model viewing tobacco cessation as a process of recovery from addiction was employed (Fildes et al., 2011). They also received a packet of self-help and other educational materials collaboratively developed by the nurse researcher and certified addictions registered nurse–advanced practice (CARN-AP), health educator, and clinical counseling director, which were published by the State of Nevada to support the smoking cessation program. Licensed counselors used in this intervention had a baccalaureate or master's degree in an approved social science field and were licensed, certified, or certified interns with the State of Nevada Board of Examiners for Alcohol, Drug, and Gambling Counselors (Nevada Tobacco Users Helpline, n.d.). They also were trained by a CARN-AP nurse researcher in the Holistic Process of Recovery from Nicotine Dependence model that is presented in Table 1. Participants also received by mail a 2-week supply of NRT patches. The study was approved by the University of Nevada at Reno Institutional Review Board. Elements of the session are depicted in Table 1.

Sample

The sample population consisted of Nevada residents, men and women, aged 18 years and older, who were enrolled from August 1, 2013, to July 31, 2014, for free smoking cessation services from the Nevada Quitline program. Because the Quitline provides services in English and Spanish languages, data from study participants who speak either or both of the two languages were included. However, the data were documented in English regardless of the oral telephone communication between the Quitline clients and their bilingual counselors. Participants had to be Nevada residents and current smokers who called the Quitline for help or were referred by their healthcare providers to the program. In light of the self-selected or provider referrals to the program, it

TABLE 1 Nicotine Dependence: Holistic Process of Recovery			
Physical	**Emotional**	**Mental**	**Spiritual**
Tobacco risks on systemic health	7 Ds to tobacco use: divert, delay, do something else, drink water, deep breathe, discuss with others, and divine assistance	Process counseling related to cognitive restructuring	Enhancing spirituality
Environmental dangers of second- and third-hand smoke	Trigger management	Fear and anger management	Value of meditation and prayer
Nicotine effects on the brain	Education about emotional aspects of withdrawal process	Assertiveness in communications	Awareness of nature
Nicotine withdrawal and management	Accessing social support networks	Enhancing self-esteem	Life purpose and balance
Medication options and potential adverse effects	Accessing affirmation resources	Relapse prevention and management	Exercising muscles of the soul
Benefits of quitting	Partner support for abstinence	Stress management strategies	Enhancing relationships
Weight and nutrition management	Journaling		
Setting a quit date and process counseling			

Adapted from Fildes et al., 2011.

might be assumed that the participants were at least receptive to smoking cessation options. However, the secondary data did not include a measure of their stage of change status.

Data Collection

A research assistant was trained by the principal investigator to interview the participants at 7 months postintervention to ascertain if they were currently abstinent and, if not, at what point they relapsed. Data were categorized to reflect their abstinence at 7 or 30 days and continuously since the intervention. Participants were also asked to rate their satisfaction with the program on a Likert scale from "don't know" to "very satisfied."

Data analyses. The North American Quitline Consortium (NAQC) Minimal Data Set questionnaire was used to obtain Quitline outcomes related to abstinence postintervention (NAQC, 2009). This tool is used to determine the point prevalence of smoking cessation rates. These program quality measures are administered at a given point in time, which in this study was 7 months postintervention. Participants are asked if they used cigarettes or other forms of tobacco at 7 or 30 days or since the intervention. Those who responded "no" to either the 7- or 30-day point or since the intervention were considered to have quit (NAQC, 2009). Descriptive statistics were used to describe the sample and determine participants' level of satisfaction with the intervention program.

Results. During the study time frame, there were 1471 participants who received the intervention. Over 72% of the participants accessed the program through the 1-800 QUITNOW toll-free number launched by the CDC to provide national access to tobacco cessation services. In terms of media and outreach distribution, 42.1% of the participants entered the program because of television and radio public service announcements, and 38% of the participants were referred by healthcare providers, family and friends, and/or local community agencies. Most participants resided in Clark County (78.7%) followed by Washoe County (12.3%), which include the two major cities in Nevada—Reno and Las Vegas. Most of the participants (95%) were English speaking. In terms of gender distribution, 59% were female. Most of the participants were not Hispanic/Latino (79%) versus those who reported to be Hispanic/Latino (13%). Most of the participants were White (59%), followed by Black/African American (21%) and 3% (Asians).

In addition, educational level among study participants was examined. Ten percent of the participants had attained a college degree, followed by 30% who had taken college classes but did not graduate, and 30% completed their high school diploma. In terms of health insurance status, 67% of the participants reported that they have health insurance, whereas 23% indicated that they were uninsured. Forty percent of the participants reported having a disability. Most (53%) of the participants were unemployed, whereas 23% of them were employed. Participants reported the following current medical conditions: cardiac conditions (19.9%), respiratory conditions (17.7%), and mental health and emotional diagnoses (53.8%). The level of addiction was also explored, and findings were as follows: current or history of alcohol addiction (10.6%), current or history of illicit/prescription drug addiction (10.6%), and history of problem gambling (3.1%).

Quit rates. Quit rates were determined by telephone interview administration of the NAQC survey at 7 months postintervention. The research assistant attempted to call all of the participants in the program. However, only 373 were successfully contacted and interviewed.

These data are reported in Table 2.

Program Evaluation

For the 7-month evaluations conducted from August 1, 2013, through July 31, 2014, 373 (25.4%) of the program participants were reached and asked to rate their satisfaction with the intervention. Data analysis determined that 68.4% of the participants reported being very satisfied, 9.2% were mostly satisfied, 0.4% were somewhat satisfied, 9.4% were not at all satisfied, and 12.6% responded "don't know." These data are displayed in Table 3.

DISCUSSION

Despite the drastic reduction in Quitline services caused by budget cuts in the State of Nevada, the new briefer intervention with a 2-week supply of NRT patches and self-help booklet was associated with relatively high quit rates, indicating that at least 34.6% of the sample remained abstinent from tobacco use after 7 months. Shorter abstinence durations of 7 and 30 days were also high compared with national data that predict that only about 4.7% of those who try to quit are able to maintain abstinence for 3 months (CDC, 2014). Of special interest is the comparison with the study by Zhu et al. (1996) who obtained only 7.5% quit rates for a single-session counseling and 9.9% for multiple sessions at 12 months postintervention. Because the 1996 study did not distribute any NRT, it supports the notions of many researchers that the best evidence for successful smoking cessation includes a combination of counseling and pharmacologic therapies. However, in the current study, none of the participants interviewed at the 7-month point requested additional NRT or mentioned any additional pharmacological interventions so it is not possible to tease out the exact influence of using the NRT in this intervention.

Patients were highly satisfied with the intervention as determined by the rating of very or mostly satisfied. However, data did not indicate if those who were mostly or very satisfied were able to achieve successful abstinence with the single session plus NRT and self-help booklet intervention. However, one can assume that this satisfaction level was related in some way to participants' successful recovery or at least temporary cessation from tobacco addiction.

TABLE 2 Seven-Month Quit Rates

One-Session Counseling Plus NRT	Percentage (*N* = 373)
Continuous abstinence rate	34.6
7-day point prevalence quit rate	35.1
30-day point prevalence quit rate	31.9

NRT = nicotine replacement therapy.

TABLE 3 Participants' Satisfaction With the Program

Satisfaction Self-Report	Percentage (*N* = 373)
Very satisfied	68.4
Mostly satisfied	9.2
Somewhat satisfied	0.4
Not at all satisfied	9.4
Don't know	12.6
Refused	0.5

Although there is no comparison of the telephone delivery system with other mechanisms used in smoking cessation programs such as face-to-face counseling, Web-based counseling, or group counseling, the overall difficulty most people have obtaining abstinence at the year mark remains very low. According to the CDC, each year, 41% of smokers try to quit; however, only 4.7% maintain abstinence for at least 3 months. This situation suggests the new one-session counseling plus NRT and self-help booklet used in this study was not only cost effective but, based on national averages, more successful.

Telephone counseling has a number of advantages not offered by face-to-face counseling such as (a) increased access to diverse populations as compared with the cost and inconvenience of traditional patient–provider counseling sessions; (b) most people have a telephone or access to one versus access to Web-based resources for self-help; and (c) telephone counseling unlike face-to-face delivery methods can be accomplished on the patients' time schedule and anonymously, if so desired. The social stigma of being a smoker is very apparent in the workplace, and increasingly, smokers must navigate smoke-free environments found in public buildings, healthcare facilities, entertainment establishments, and restaurants. Increased public education and awareness about the dangers of second- and third-hand smoke makes smoking socially unacceptable, and even illegal, in many public places. Indeed, exploration of public attitudes about requiring a smoke-free environment indicates overwhelming public support for smoke-free facilities and relocation of smoking shelters far away from access points in buildings (Duffy et al., 2013).

The adoption of the NAQC to measure quit rates related to state-sponsored smoking cessation Quitlines has facilitated comparisons of outcomes across state lines. The initial goal of the Nevada Quitline was to provide services to 3031 residents during the 11-month time frame for the evaluation of the one session plus NRT and self-help booklet model. However, because of funding reduction, only 49% of the initial goal was achieved.

Implications for Nurses

This study is important because it suggests to nurses, who are often on the front line for smoking cessation assessment and referral, that a short Quitline intervention can indeed help patients to quit smoking. Nurses at all levels, but especially those in primary care, emergency care, addictions, or mental health settings, can refer patients to the telephone Quitlines in their states. Telephone Quitline counseling is said to be one of the most effective approaches to smoking cessation because it reaches a diverse population and provides broad reach (Fiore et al., 2008). This is especially important because racial differences in smoking patterns, nicotine dependence, onset of smoking, and readiness to quit are evident in African American versus White smokers. Rayens, Hahn, Fernander, and Okoli (2013) found that, despite comparable rates of smoking with Whites, African Americans experience greater tobacco-related disease burden.

They also reflect higher levels of serum cotinine than Whites, a biomarker for nicotine exposure, which is probably related to greater exposure to second-hand smoke. African Americans are thought to be more likely to try to quit smoking than Whites but apparently do not succeed as readily as only 14.6% of African American adults report being a former smoker as compared with 25.8% of Caucasians. The good news is that African Americans are generally lighter smokers than Whites and begin smoking at a later age (Rayens et al., 2013). These racial differences in smoking patterns and onset of smoking point to the need to include more tailored counseling to clients based on their racial identities. Nurses are especially well positioned to accomplish this initial counseling with patients, and to refer them to the Quitline and other smoking cessation resources.

Implications for Expanding Public Health Outreach

There is also a great need to broaden and increase public health awareness of smoking hazards to prevent teens from becoming smokers and, if so, to encourage them to stop smoking. In Nevada, young people are not eligible for the Quitline smoking cessation program, but if teens do call, they are referred to the American Lung Association of Nevada that sponsors the NTPC's strategic plan. Although there is no available literature on Quitlines for teens, there is considerable evidence about using Internet-based programs for youth smoking prevention and cessation. Park and Drake (2015) systematically reviewed the characteristics and effects of Internet-based smoking cessation programs that were designed primarily as RCTs. They found a variety of Internet strategies being used to create engagement of the users, hold their attention, and provide tailored educational feedback about tobacco use. The quit rates associated with the programs were measured at 7- and 30-day prevalence points. Quit rates varied widely depending on the timing of the postintervention assessment, type and characteristics of the program, and other factors. Most studies showed some positive results, especially in the treatment groups, but for many, the results did not hold at long-term follow-up. However, this integrative review showed the potential that an Internet-based public health strategy might have in reaching the 3800 youths who start smoking each day (CDC, 2012a).

Study Limitations

This study relied on secondary data and participant self-reported data to collect information about quit rates and user satisfaction. There was no way to match participant characteristics, smoking patterns, racial profiles, and readiness to quit with outcomes of the program. The study intervention was a new model of free counseling, self-help materials, and short-term NRT. There was no way to determine if the participants obtained additional NRTs or other pharmacological aids through their healthcare providers. Consequently, it is not possible to determine what aspects of the intervention were most helpful or even if the intervention was responsible for the excellent quit rates at the 7- and 30-day point prevalence and 7 months postintervention. More data are needed to guide refinements in the counseling model that might address specific needs of participant groups such as those belonging to a racial minority or other demographic subgroups. The participants were a convenience sample of people obviously somewhat motivated to quit smoking as they called in so the results cannot be generalized to any external group. Another program evaluation study is needed to compare outcomes related to intervention techniques that can be varied using an experimental or at least a quasi-experimental research design.

CONCLUSION

The state of Nevada Quitline participants received a one-time telephone smoking cessation intervention plus a 2-week supply of NRT and a self-help booklet that was provided by certified licensed counselors who were trained by a CARN-AP nurse. Despite funding reduction, Quitline participants were very or mostly satisfied with the type of services they received. In addition, quit rates were higher than expected when compared with national norms.

These findings suggest that a brief counseling intervention, limited supply of NRT, and well-designed self-help booklet can positively impact those smokers who seek help from a state Quitline. More research is needed to refine the intervention to improve outcomes for adults and to address the public health crisis related to underage smoking.

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