

A Health Coach Industrial Workplace Smoking Cessation Quality Improvement Program  
for Individuals

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**Abstract**

This quality improvement program sought to institute a sustainable individual smoking cessation program in an urban, industrial workplace clinic. Smoking prevalence in adults in Nebraska greatly exceeds 12%, the goal established by Healthy People 2020. Low smoking rate benefits for the workplace include increased productivity, and less absenteeism. Participants had four high intensity counseling meetings with the P.I., plus two follow up phone calls. Two of the seven participants quit smoking during the program and both follow up calls, four cut back on the number of cigarettes smoked daily, and three had at least one quit attempt of 24 hours or longer. The program was critically evaluated with the assistance of clinic staff to ensure sustainability.

**Introduction**

**Background Knowledge**

Despite all that is known about the harms of smoking, it is still the leading cause of preventable death in the United States (U.S. Department of Health and Human Services [US DHHS], 2014). A total of 480,000 people die from smoking related diseases annually in the United States (US DHHS, 2014). Half of all smokers will die from a smoking related cause, such as cancer, ischemic heart disease or chronic obstructive pulmonary disease (COPD) (Centers for Disease Control and Prevention [CDC], 2011). COPD results in more than 143,000 deaths every year, ranking third as the most common cause of death each year (Hoyert & Xu, 2012). The total financial burden from smoking was between \$289 and \$332.5 billion total from 2009 to 2012 (US DHHS, 2014).

In 1964, Surgeon General Luther L. Terry, MD, released the first report on the consequences of smoking, increasing the public's awareness of the health risks (US DHHS, 2014). This was followed by an effective decline in smoking rates from 42% in 1965 to 18% in 2012 (US DHHS, 2014). States range from 9.3% to 26.5% in terms of smoking prevalence among adults (CDC, 2012). Healthy People 2020 has established a goal of 12% or less of the adult population to be a smoker. However, this goal may be difficult to achieve, as 17% of adults will be smokers in 2020 at the current rate of decline (CDC, 2011b).

Disparities, including ethnicity, gender, age, education and socioeconomic status, exist for smoking prevalence. Smoking rates are 22.8% among non-Hispanic whites and 21% among non-Hispanic blacks, higher rates of smoking than Hispanics' 13.5% (CDC & National Center for Health Statistics [NCHS], 2010). Males are more likely to currently smoke, at 23.4%, compared to females at 17.9% (CDC & NCHS, 2010). Nearly two thirds of females have never smoked, while half of all males have (CDC & NCHS, 2010). Smoking prevalence decreases as a person ages, with 23.4% of 18-44 year olds, 21.9% of 45-64 year olds, and 9.5% of those 65 and older currently smoking (CDC & NCHS, 2010). Education is another disparity, with current smoking prevalence at 25.9% for adults with a high school degree or less and at 7.6% for adults with a bachelor's degree or higher (US DHHS, CDC, & NCHS, 2012). A lower socioeconomic status correlates with an increased likelihood of current or former smoking; 31.5% among those below the poverty level smoke, compared to 19.6% among those at or above the poverty level (CDC, 2009).

Based on known smoking disparities with socioeconomic status, age, ethnicity, and male gender, it can be inferred that industrial workplace populations have a high prevalence of smoking among employees. There are numerous benefits for an industrial work force to have fewer smokers. These benefits include increased productivity, less absenteeism, fewer health insurance claims, and better employee retainment due to fewer employees experiencing health complications from smoking that limit their ability to work (Perko, Eddy, & Kahler, 1996). Fewer smokers may improve the image of the employer and general moral of employers (Perko, Eddy, & Kahler, 1996). Both employers and employees benefit from smoking cessation.

### **Local Problem**

A local, urban industrial worksite identified a high smoking prevalence among its workforce. This Midwest worksite in 2013 had 981 local employees working within 3 plant and office locations, with 259 females and 722 males. Specific worksite demographics were not provided. Instead, the 2012 census reports from the worksite's zip code were used as a reference. The area is 23.3% African American, 64.7% Caucasian, and 13.4% Hispanic (U.S. Census Bureau, 2012). Furthermore, through utilizing information on smoking disparities, it can be inferred that this workplace population had a higher percentage of smokers than Nebraska's 18.4% (CDC, 2012). The industrial company has had a contract for two decades with a large, health system in the city to offer a company workplace clinic staffed with two nurse practitioners (NPs) and two medical assistants (MAs). This clinic is open five days a week, offering high quality acute, chronic, and preventative care. In an effort to improve patient health and increase productivity for the company, the clinic has focused on wellness promotion. The clinic

NPs had identified a high smoking rate among their workplace patient population, with many patients suffering from smoking related illnesses. Smoking cessation was one of the clinic's many interests.

### **Intended Improvement**

In conjunction with stakeholders, the following purpose and aims were developed: 1) explore the effectiveness of the smoking cessation program entitled *Beat the Pack* for this population; 2) determine effectiveness of individual health coaching for this population; 3) explore the strengths and weaknesses of using a health coach for this population; 4) analyze the results and logistics of the programs with clinic staff to identify the most feasible and beneficial components to continue in the clinic.

The individual smoking cessation program at the workplace clinic was the primary focus and completed with seven participants in the fall 2013. Originally, a group cessation program was offered as a choice also, but was abandoned following a lack of interest and participation. The goal was to implement a successful individual cessation program that could be sustained indefinitely with rolling enrollment.

### **Study Question**

The purpose of this project was to determine the effectiveness of an individual health coach model employing behavioral counseling strategies for smoking cessation with an adult population within an urban, industrial work site setting. Through collaboration with clinic staff and feedback from participants, the program would be maintained or improved as necessary, to provide the best program possible. This would allow the clinic to have an already tested program immediately ready to be utilized with any interested smoker.

## **Methods**

### **Ethical Issues**

The Creighton University Institutional Review Board and the clinic's Nurse Research Council approved this program. Written informed consent was obtained from each participant. Participants were able to withdraw from the program at any time, without fear of retribution. Support of the program was obtained from the clinic staff, the clinic manager, and the company's human resources (HR) department.

### **Setting**

The worksite's clinic offers free visits to full time and part time employees and their dependents who are on the company's health care plan. This program was no cost to participants. The worksite supports smoking cessation programs, with a smoke free campus policy, and 100% reimbursement for cessation medication costs if the employee or dependent stays tobacco free for 90 days. Fifty percent reimbursement is given immediately, with all receipts turned in to HR.

### **Planning the Intervention**

The goals of the company, the clinic staff, and the Principle Investigator (P.I.) all aligned in wanting to create a sustainable program to aid in decreasing the number of smokers. A team approach was used for planning, project development and approval. The team's key stakeholders included the P.I. the clinic NPs, a Pfizer representative, a statistician, and the company's HR department. Project meetings occurred from May 2013 through August 2013. The goal number of participants was 15. The PI was to compile all relevant data and present it to the stakeholders after the program was completed with the original participants who started the program in fall 2013. A

statistician was available to aid in analyzing data. Participants were assigned a number, with only the number as identification on the questionnaire or follow up phone call sheets.

The intervention consisted of four, 20-45 minute counseling meetings with the P.I. The U.S. Preventative Services Task Force (2012) defines this as medium intensity counseling. The meetings took place in the company clinic. The program instructional materials were obtained from Beat the Pack, a validated, evidence based smoking cessation program designed for use in a workplace setting (Pfizer Inc., 2008). It was developed by Pfizer Incorporated, utilizing public health guidelines for smoking cessation, for group workplace smoking cessation programs, but was modified here for individual programs (Pfizer Inc, 2008).

The main factors that contributed to the choice of an individual smoking cessation intervention were the failed attempt to recruit enough participants for a group cessation program, along with the interest of those who initially signed up with human resources in summer 2013. The majority of those who signed up for a smoking cessation program indicated they were interested in an individual program, not a group program. These factors, combined with the company and clinic interest in wellness and smoking cessation, resulted in the plan to begin a sustainable individual cessation program.

**Recruitment.** The initial list of nine names from human resources, those interested in a group or an individual smoking cessation program, was obtained by the P.I. Those people were contacted, with a maximum of three phone call attempts. A total of six people agreed to be participants, beginning the program in September 2013. One person obtained a work injury and later told staff that he had quit smoking during an

office visit. He was removed from the list of participants. A flyer was posted in the company clinic in August 2013, though not in the company plants due to a request from human resources. They thought that employees would feel overwhelmed with information on cessation programs, as there had been a flyer promoting the group program in the plants the month prior. Word of mouth from the clinic staff, along with the assistance of the flyer, generated interest from four more people during fall 2013. The researcher attempted to contact these people, ultimately resulting in two more people agreeing to participate. Thus, there were seven participants who completed all in person meetings by December 2013. The follow up phone calls occurred between October 2013 and January 2014. The meeting with clinic staff and human resources occurred mid-January 2014.

**Procedure.** After agreeing to participate, participants were checked into the clinic by the MAs. The clinic NPs were available for support, guidance, and to answer questions that the PI did not have the answer to. They also were available to prescribe prescription cessation medications to participants.

After completing informed consent and a baseline questionnaire, the first meeting with participants included setting goals, identifying personal reasons for quitting, exploring barriers for quitting, and setting a quit date (ideally before the next visit). At this visit, handouts and teaching were provided on smoking cessation medications, the industrial manufacturing company's smoking cessation reimbursement plan, using the buddy system to aid in quitting, creating a smoking quit plan, and alternatives to smoking. A personal progress tracker was provided to participants and reviewed at each visit. If the participant desired to start a prescription cessation medication, a clinic NP

ordered the medication. The participant was given information on signing up for the free (depending on the participant's text messaging plan) SmokefreeTXT, a text-messaging program. Lastly, they were given information on the Smartphone application NCI (National Cancer Institute) QuitPal. It is available on the Apple iTunes store. This is a free, interactive application that allows users to set their quit date, track their habits and progress, receive motivational messages, and access the National Cancer Institute's phone line or live chat for additional support.

The second meeting's interval was decided upon between the P.I. and participant (ideally in 1-2 weeks). During the second meeting, following a health coach model, problems and goals were discussed, with solutions created for issues or unmet goals. The personal progress tracker was reviewed. At this visit, handouts or teaching were on managing stress, avoiding weight gain, the freedom from smoking, and what to do if a slip-up occurs. The P.I. and participant decided upon the third visit's interval.

The third visit also addressed how the participant had done meeting his or her goals and any barriers experienced. The personal progress tracker was reviewed. Handouts and teaching were on benefits of quitting: health, financial, and time.

The fourth visit reviewed goals, barriers, and the personal progress tracker. Praise was given if the participant has remained smoke free and a plan was created to stay smoke free. Handouts from other visits, SmokefreeTXT, support systems, NCI Quitpal, and any other resources the participant might like to use in the future were reviewed. A certificate of program completion was given to participants, which could be turned in to human resources to obtain 50 Wellness points. For this company, Wellness points may be

applied towards decreasing the cost of health insurance premiums and can be obtained a variety of ways.

Smoking status was assessed at each visit. If the participant had restarted smoking, or was never able to quit, the option was given to continue the program and set a new quit date, or stop the program completely. Medication options were discussed again. The company's smoking cessation reimbursement plan was reviewed also, as there are other methods available to aid in smoking cessation (i.e. hypnotherapy).

Six to eight weeks after the initial individual meeting, the P.I. called participants for the first follow up phone call to assess smoking status and obtain feedback on the program. Four weeks after the previous phone call, the P.I. again called participants. A maximum of three attempts were made to contact participants.

Implementation of the program was consistent with all participants, in terms of materials discussed and handouts given. However, the actual length of meetings with participants after the first meeting did vary. Some participants were more willing to discuss their feelings, experiences, and thoughts with the P.I. After reviewing the handouts for a particular week, some participants did not have much they wanted to talk about and, therefore, the meetings did not last as long. The project was not set up to detect any differences in outcomes that occurred due to implementation variability.

### **Planning the Study of the Intervention**

This quality improvement program intervention was evaluated through the follow-up phone calls with participants, a stakeholders meeting, and the baseline questionnaire. The follow up phone calls provided valuable feedback on the program and assessed smoking status after the four counseling meetings had ended. The number of

participants who quit smoking, had a quit attempt, scored as ready to quit, or cut back on cigarette use demonstrated the success of the program. A quit attempt was limited to those 24 hours or longer (CDC & NCHS, 2009). The questionnaire aided in assessing and understanding the participants' smoking history, nicotine addiction severity, readiness to quit, and general knowledge regarding smoking and secondhand smoke related diseases. This information contributed to the analysis of the program for the workplace population.

### **Methods of Evaluation**

Collected data was both quantitative and qualitative. The data collected included a baseline questionnaire, Readiness to Quit questions, Fagerstrom Test for Nicotine Dependence, knowledge questions on smoking, plus both closed and open-ended questions during the phone calls.

Initial data collected was the baseline questionnaire with information on age, sex, number of quit attempts in the past year, years smoked, cigarettes per day, Readiness to Quit, the Fagerstrom Test for Nicotine Dependence, and knowledge questions on the risks of smoking and secondhand smoke (called risk perception and social influence).

The Readiness to Quit questions assisted in identifying if a participant was ready to quit smoking. They were based off of the Transtheoretical Model of Behavior Change, created by Prochaska and DiClemente (1983) to explain the process of change in smoking cessation or general behavior modification. There are five stages of change: precontemplation, contemplation, preparation, action and maintenance. These questions used a five point Likert scale that assesses for reasons to quit smoking, and the presence of a quit plan. Each response has a numerical value; a score may be calculated from the participant's results. A score of 20 or more signifies a probable readiness to quit smoking.

Heatherton, Kozlowski, Frecker and Fagerstrom (1991) created the Fagerstrom Test for Nicotine Dependence, from the Fagerstrom Tolerance Questionnaire. It is a six-question test that helps in identifying how dependent a participant is on nicotine. Scores are assigned for each answer. The total score of participants places them in a dependence level, ranging from very low dependence to very high dependence.

The risk perception and social influence questions assess the participants' knowledge on secondhand smoke, addiction and illnesses caused by smoking. This part of the questionnaire was adapted from the National Health Interview Survey questions for adult tobacco users.

During the follow-up phone calls, questions were asked on the strengths and weaknesses of the program. Those who were still smoking were asked the readiness to quit questions, along with any current barriers they had to quitting. All participants were asked if they would recommend the program to others. Ongoing clinic support was offered. This data, in particular, was used to reflect on the cessation program, and to help ensure that the program is sustainable.

### **Analysis**

Quantitative data was analyzed in terms of mode or mean. The quantitative data, such as most of the phone call information, was analyzed through grouping the data into themes. General descriptive techniques were fitting for most of the data. The small number of participants did limit statistical analysis options. Both the Readiness to Quit and Fagerstrom Test for Nicotine Dependence question responses could be calculated and categorized.

### **Results**

**Outcomes**

**Sample.** See Table 1 for participant characteristics. All participants attended all four meetings with the P.I. All participants were employees of the company, and none were dependents. Baseline smoking related knowledge was fairly strong. All agreed there was some benefit to quitting smoking, even if a person had smoked a pack per day for 20 years. Also, all agreed that secondhand smoke was very harmful or somewhat harmful. One person disagreed with all others, that smoking is physically addictive. All disagreed or strongly disagreed that light cigarettes are safer than regular cigarettes. While five agreed smoking while pregnant may harm the baby, two were not sure. See Table 2 and Table 3 for additional secondhand smoke and smoking related knowledge results. As shown, all participants agreed that smoking can cause lung cancer and that secondhand smoke can cause respiratory problems in children.

**Findings.** Two participants quit smoking and sustained cessation through both follow up phone calls. Both used prescription cessation medications. When asked how not smoking was going, the participant replied, "I'm completely over it, I don't think I'll ever go back!" Three of the five participants who did not quit smoking had at least one quit attempt of 24 hours or more. See Table 4 for Readiness to Quit results. Four of the five continued smokers reported cutting back on the number of cigarettes smoked daily. See Table 5 for feedback from participants obtained during the first phone call. All participants reported they would recommend the program to others. They stated a variety of reasons for this: from the support to bringing awareness to cessation efforts.

**Process change.** Prior to the implementation of this program, there was no formal smoking cessation program for employees or dependents that wanted to quit smoking.

They were able to receive free support for their goal of cessation, which included meeting with the provider and optional handouts. There was no offering of Wellness points.

There was excellent success in implementing the meetings with participants as planned. Although the P.I. only met with participants on Wednesdays, due to the low numbers, it was easy for a participant to reschedule for the following week, if needed. The clinic staff was very adaptable and accommodating to the P.I.

**Missing data.** Three participants could not be reached for the second follow up phone call. All three of these participants were still smoking at the first follow up phone call, but it is unknown whether they quit, decreased, or increased their cigarette intake in the weeks that followed. In addition, the readiness to quit questions were not asked a third time for those three participants, if they had continued to smoke. Another piece of important data was missing regarding the local problem. The company did not wish to share data regarding the prevalence of employee smokers or data on employee demographics. Regarding smokers, they stated the only data they have is for smokers at all company locations across the United States, not data specifically for this program's location. They did not wish to share the information they had, as they stated it might be misleading. Thus, there was no baseline data available regarding smokers at this industrial workplace.

## **Discussion**

### **Summary and Interpretation**

**Recruitment and participation.** This industrial workplace has nearly 1000 employees. Based on known Nebraska population statistics, at least 180 employees are current smokers (CDC, 2012). An assumption can be made that this number is higher due

to known industrial employee characteristics. The company was supportive of this smoking cessation program, but participation rate was low. The goal number of participants was 15, 13 expressed interest, and program participation was seven.

Increased participation may have occurred with the elimination of HR as an intermediary. HR was involved in the initial recruitment. Some employees did not want to let HR know they were smokers, and were worried about discrimination from HR based on their smoking status. Stuber, Galea, and Link (2009) analyzed stigma in smokers, 17% of participants reported experiencing some sort of differential treatment and 44% feel less valued, due to their smoking status. It has become more common for workplaces to not hire smokers. Reasons for this include better employee health, increase productivity, and decreased health insurance costs (McCarthy, 2013; Schmidt, Voigt, & Emanuel, 2013). To take advantage of the company's smoking cessation benefits, employees must turn in receipts to HR. If an employee wants to utilize the company benefits for cessation reimbursement, HR must be involved. More employees would take advantage of smoking cessation interventions if HR was not included in the process.

**Change in Readiness to Quit.** All participants made progress with their Readiness to Quit score. Three of the seven originally scored as ready to quit, while all of the remaining five smokers scored as ready to quit by the first follow-up phone call. The two smokers who were reached for the second follow-up phone call scored again as ready to quit. Although only two participants quit smoking, it is encouraging that participants progressed in their readiness to quit. However, readiness to quit may not predict motivation to quit (Stoklosa et al., 2010). It would be interesting to follow these smokers for an extended period of time to see how their readiness to quit scores correlate with

success in cessation attempts. In the tool that was used, no data can be found correlating these results to the results of different studies. Using a different readiness to quit tool, similar results were found. Participants in a study that provided cancer risk feedback and personalized smoking cessation messages in a workplace setting also progressed in their readiness to change both one and two years after the intervention (Schnoll et al., 2005).

**Comparison to national data.** The results of this program are comparable to a meta-analysis analyzing the results of similar interventions. Based on a total contact time range of 91-300 minutes, the estimated smoking abstinence rate is 28.4% (US DHHS, 2008). There was no increase in cessation success when contact time was greater than 300 minutes (US DHHS, 2008). With four to eight sessions total, the estimated abstinence rate is 20.9% (US DHHS, 2008). Cessation rates did increase to 24.7% with greater than eight sessions (US DHHS, 2008). Individual counseling findings are an estimate abstinence rate of 16.8%, compared to 13.9% for group counseling and 12.3% for self-help (US DHHS, 2008). For participants who utilized both cessation medications and four to eight counseling sessions, abstinence rates are 26.9% (US DHHS, 2008). This is very similar to this program's results of 29% cessation. Both participants who stopped smoking utilized cessation medications. Although this program involved few participants, the fact that the outcomes are similar to or better than national data is still reassuring that the program was executed well.

### **Limitations**

Limitations included restricted generalisability, a design using medium intensity counseling, truthfulness of participants, and sustainability of the program. Limitations of generalisability included that participants were from one industrial workplace in the

Midwest. A wide variety of cities and settings would have resulted in more meaningful data. For participants from varying educational levels, the handouts may be difficult to understand. More participants would have been useful for generalisability, along with more data on the characteristics of the participants, in order to have a better understanding of the possible effects of personal characteristics on cessation success for this population. A program with high intensity counseling may have resulted in better outcomes. Alterman, Gariti, and Mulvaney (2002) found increased sustained cessation rates among participants who received high intensity counseling sessions, compared to medium intensity counseling at 9, 26, and 52 weeks post intervention. High intensity cessation rates were 45%, 37%, and 35%, medium intensity cessation rates were 27%, 12%, and 12%, and low intensity cessation rates were 35%, 30%, and 27%. There is the possibility that the participants were not truthful with their responses to the baseline questionnaire or the follow up phone call questions, wanting to impress the P.I. with their answers.

The outcomes of a sustained individual program may vary. If participants are ready to quit and want structured support with educational information, they are more likely to be successful. If they sign up for the program simply to obtain Wellness points, they are unlikely to pass through the stages of change or have a successful quit attempt. The program success would also depend on the clinician leading the program meetings. If that individual is not able to devote the needed attention and time to each meeting, the participant success rate may decline.

## **Conclusions**

It is valuable for workplace clinics to offer an individual smoking cessation program to employees and dependents. The clinic and the company have congruent goals, to decrease the number of smokers. Behavioral counseling approaches can be successful within industrial workplaces. Readiness to Quit and the Fagerstrom Test for Nicotine Dependence questions are strong tools to utilize within these programs.

Further studies into smoking cessation programs in workplaces could compare group and individual programs. Other than increasing the number of participants or recreating the program in a different workplace setting, future studies could investigate into what type of cessation program tends to work best in workplace settings. Some participants may benefit from an intensive digital intervention that focuses on the use of cessation websites, smart phone applications, and texting services.

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