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An Evidence Based Smoking Cessation Project in Patients Admitted to an In-patient Alcohol and Drug Treatment Rehabilitation Program

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Abstract

Smoking has emerged as a significant public health issue and evidence showed that in people who use or used drugs and alcohol smoking rates are at an all-time high. Smoking has been identified as a contributing factor in a myriad of chronic illness including Asthma, COPD and Cancer. For people to break a smoking habit, of many years, requires a dynamic comprehensive approach like those currently utilized in drug and alcohol treatment programs. The literature suggests that intensive smoking cessation interventions involving behavioral support through counseling and pharmacotherapy are needed to effectively treat this population. An evidence-based project was conducted to assess the quit rates among patients receiving Nicotine Replacement Therapy (NRT) and intensive counseling compared to patients receiving standard care: NRT and brief information on smoking cessation. A significant decrease in tobacco use and a willingness of staff to incorporate the intervention into clinical practice was observed. This change in practice has resulted in more sustain quit rates over time. The findings of this project revealed significantly better results in the intervention group's quit rates over-time. This intervention can be used in all healthcare settings.

Keywords: Smoking cessation; Tobacco use disorders; Substance abuse treatment

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Introduction

The National Centers for Disease and Prevention [1] estimates that 46.6 million, or 20.6% of adults are smokers. The United States (US) spends nearly \$100 billion in direct medical cost per year. Smoking is responsible for 440,000 deaths annually in the US, yet it is the number one cause of preventable deaths [2]. Kalman [3] estimates that among individuals with substance abuse problems; 74-88% of them are smokers; which is nearly four times greater than the general U.S. population rates; and tobacco related illness is a major cause of death for people in this population [1]. Prochaska et al. [4] reviewed several studies and concluded that substance abusers, who tend to start smoking at a younger age, are more likely to be heavy smokers, nicotine dependent, and experience greater difficulty with quitting. Thus, individuals with substance related addictions are at greater risk of tobacco-related morbidity. Hurt et al. [5] maintained that among individuals treated for alcohol dependence, tobacco related diseases were responsible for half of all deaths, even greater than alcohol related causes.

Despite the relevancy of tobacco cessation, few addiction treatment programs offer treatment in this area. However, smoking cessation has been identified as an important clinical target during substance abuse treatment for two main reasons: Smokers in the early stages of substance abuse treatment are generally aware of the health consequences of tobacco use and are interested in receiving help to quit smoking [6]. The most recent Public Health Service clinical practice guidelines for smoking cessation encourages substance abuse programs to address tobacco use among their patients [7]. Studies have shown that smoking cessation during early recovery enhances long-term recovery/sobriety [4,8]. Many individuals receiving substance abuse treatment also uses tobacco; therefore, suggesting that smoking cessation is an important clinical target for most patients during recovery. Smoking cessation among substance abusing patients could provide immense benefits in reducing their morbidity and mortality combine with reducing public health expenditure.

The purpose of this evidence-based project is to evaluate an intervention that uses intensive counseling by alcohol

and substance abuse counselors during a smoking cessation program designed for patients housed in an inpatient smoke-free substance abuse rehabilitation facility. The goal is to help patients to quit smoking and remain tobacco free at discharge.

Background and Significance

According to the American Heart Association, nicotine addiction has historically been one of the hardest addictions to break, because the pharmacological and behavioral characteristics that determine tobacco addiction are similar to those determining addiction to heroin and cocaine [9]. Nicotine's mood-altering effects act both as stimulant and a relaxant. Nicotine is unique in comparison to most drugs, as its profile changes from stimulant to sedative/pain killer in increasing dosages and use [6]. The evidence supports initial smoking cessation programs with one-on-one counseling; Nicotine Replacement Therapy (NRTs) (i.e., Nicotine patches, gum or lozenges); and follow-up increases the rates of abstinence up to 6 months to a year. Without any intervention smokers are likely to relapse and be less motivated to start quitting. Quitting smoking is a process that occurs over time, so it's essential to assess the stage of change the smoker is at; therefore, smoking counseling needs to be individualized and staged matched and efforts at quitting needs to be reinforced.

Smokers have varying responses to smoking cessation interventions; such as, behavioral motivation intervention (counseling) and other types of interventions are based on where the smoker is at. Apollonio et al. [10] states that counseling along with pharmacotherapy appears to increase tobacco cessation (RR 1.74, 95% CI 1.39-2.57). Therefore, one-on-one and group counseling along with the use of NRTs may prolong abstinence rates and prevent relapse. Much of the evidence supports an intensive intervention for tobacco treatment concurrently with other substances. Although the smoking cessation quit rates appear to be modest the clinical significance is important because many patients are young and relatively new to tobacco use, so the chronic effects of smoking are not yet evident.

Methods

An evidence-based project was conducted to assess the quit rates among patients receiving Nicotine Replacement Therapy (NRT) and intensive counseling compared to patients receiving standard care: NRT and brief information on smoking cessation. Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model [11,12] was used to guide the implementation of the project. All patients that were admitted to the facility with history of smoking were asked to sign a smoking consent (which was part of the facility's policies and procedures) education and recruitment materials were all reviewed and approved by Institutional Review Board Office of Research and Integrity Assurance at Arizona State University and the Boards of Directors of the participating organization. All project related information was stored on site with access only by the co-investigator and the QA/QI Director of the site. All documents used in the project were de-identified to safeguard the identities of the patients during chart reviews, and participants of the project. Patient

and staff were asked to voluntarily take part in the project with the assurance that their involvement would be confidential and anonymous.

Participants and Setting

Informational sessions were schedule and conducted with office staff, clinical staff, program staff and administrators; to introduce the project and explain their role in the project. All employees of the center; such as, office staff, counselors, clinicians and administrators were invited since all have important roles in implementing certain aspects of the project. Fifty patient charts were audited prior to the intervention and 68 charts audited after the practice change.

The site is a free standing for profit substance abuse facility located in a residential area in New York. This is an urban setting that is surrounded by major teaching hospitals as well as other drug and alcohol treatment programs. The facility is in a five-story building and has 153 in-patient beds on three of the floors. It operates 24 hrs a day 7 days a week. The staffing is comprised of nurses (Registered and License Practical Nurses), counselors, medical staff (Medical Doctors, Nurse Practitioners and Physician Assistant), and support staff (dietary, housekeeping, maintenance, medical records, administrative assistance). All employees of the facility associated with the smoking cessation program participated in the informational sessions focusing on educating staff about the program. This provided an opportunity for professional development.

Intervention

Informational sessions with the staff were held twice during the project, one to introduce the project and another follow-up meeting to inform them of the findings of the project. The contents for introducing the project included the following: An overview of the smoking cessation program including the role of the admissions staff to screen smokers and refer them to counselors. The role of the counselors included the implementation of the smoking cessation program intervention. Current smokers participated in the smoking cessation program during their 28-day substance abuse treatment program. The counselors received 8 hrs of training in the implementation of the intervention and use of the assessment tools associated with the smoking cessation program outlined in the Smoking Cessation Algorithm. The algorithm was presented to the counselors, so they were aware of each step of the smoking cessation program. The training consisted of two (4 hrs) sessions with an expert in smoking cessation, detailing cognitive behavioral counseling steps/motivational technique in cessation counseling, group and individual session overview.

The counselors received training to conduct the following assessments using the following instruments that were adopted by the facility: 1) The Fagerstrom Test of Nicotine Dependence [13]. The Fagerstrom Test of Nicotine Dependence (FTND) is a screening instrument for physical nicotine dependence and is extensively used in various countries; it is easily understood and rapidly applied. The scores obtained on the test permit the

classification of nicotine dependence into five levels: very low (0 to 2 points); low (3 to 4 points); moderate (5 points); high (6 to 7 points); and very high (8 to 10 points). The analysis indicated that the reliability index for the overall score on the FTND was excellent (0.87), factor 1 presenting better reliability (0.87) than did factor 2 (0.67). In 14 studies that evaluated the internal consistency of the FTND, the Cronbach's alpha coefficient ranged from 0.55 to 0.74, indicating that the FTND has moderate internal consistency. In another study, the overall score on the FTND was also significantly associated with the intention to quit smoking, the history of 24 hrs quit attempts in the last year, the cigarette type (regular or light) and the number of pack-years, suggesting that the instrument has adequate criterion-related and predictive validity; and 2) The Motivation to quit ladder [14]. The motivation to quit ladder an 11-point Likert-type scale ("ruler") Rulers assessing importance, readiness, and confidence in quitting can rapidly assess these three dimensions of motivation. They have been widely disseminated, do not require scoring or the use of algorithms, take only a short time to complete, and are familiar to patients and providers alike due to the common use of similar kinds of scales to assess medical symptoms like pain. Biener and Abrams [14] found this instrument to be adequate with respect to three indicators of validity and the reliability was found to be adequate (coefficient alpha $\alpha=0.75$). These items were incorporated onto an audit form assessing how well the intervention worked.

Data Collection

Counselors, administrators, office and nursing staff completed the following questionnaires before and after the intervention: 1) Demographic information was requested from the participants to describe the sample; 2) Readiness to Change Questionnaire [15] was administered to measure the staffs' readiness to change practice. The internal consistency of the questionnaire was established by calculating Cronbach's alpha coefficient for each of the 4-item scales representing the stages of change. Precontemplation=0.73; Contemplation=0.80; Action=0.85. This indicates that the items scores can be reasonably being regarded as constituting a scale in each case. Validation of Readiness to Change (RCQ) was examined by comparing: relationship among scales scores and comparison with screening questions. The relationship between the two variables was highly statistically significant. These relationships strengthen confidence that the RCQ is measuring what it purports to measure [15]; and 3) The Self-rated smoking cessation counseling skills and self-efficacy questionnaire was administered before and after the implementation of the smoking cessation program intervention; to rate the staffs' knowledge on smoking cessation and their perceived ability to help patients quit smoking. The self-rated smoking cessation counseling skills and self-efficacy questionnaire is a 12-item scale that addresses skill and self-efficacy using a 5-point measure (strongly disagree to strongly agree). Reliability and validity factors exhibited positive intercorrelations (all $p<0.001$), with Pearson's r ranging from 0.59 to 0.74. The same post- test questionnaire was used after the intervention was completed during the report of the evaluation of the project.

Chart Audits

Fifty patient charts were audited prior to the intervention and 68 charts after the completion of the intervention. Pre-intervention data was collected retrospectively, for instance, charts of patients admitted and discharged prior to the start of the practice change. A post chart audit was done to assess if the policy change was effective in changing the smoking behaviors of smokers receiving the smoking cessation intervention. A review of the electronic medical record was conducted to obtain demographic information to describe the participants of the smoking cessation program and evaluate their progress. All HIPAA regulation and facility policies were adhered to in regards of confidentiality and safe guarding of the electronic medical records. Therefore, no records were reviewed that did not have a signed HIPAA statement.

A pre-intervention chart audit and the initial informational session were held and the staff completed the pre-and post-test questionnaires. After the intervention was instituted for 28 days, the treatment program outcomes were evaluated using the chart audit form. A follow-up presentation was presented to the staff, clinicians, counselors and administrators of the findings of the practice change. Data were entered and stored in Statistical Package for the Social Sciences (SPSS®) version 22. Descriptive statistics were used to describe the sample and outcome variables. Inferential statistics were used to analyze the major outcome variables: Readiness to Change and the number of patients completing the program and being smoke free. The critical value was set at $p<0.05$ and two tailed tests were run.

Findings

Readiness to change

The sample included 129 which included medical 5 (3.8%), nursing 25 (18.8%), nursing aids/orderlies 21 (15.8%) 21 (15.8%) clinical, 21 (15.8%) admissions, 21 (15.8%) administrative, 12 (9%) office and 10 (7.5%) ancillary staff. The average age of the sample was 39.5 (SD=12.81) and the ages ranged from 20 to 73 years. The average years worked in the facility was 7.97 (SD=7.09), and the years of employment ranged from 1-31 years. The subjects consisted of 66 males (49.6%) and females 63 (47.4%). Education level consisted of 23 (17.3%) High School/GED, undergraduates (Associates and Bachelors prepared combined accounted for 72 (54.2%) and graduate level education (masters and doctoral/PHD) 33 (24.8%). Smoking versus non-smoking staff was compared. Smokers accounted for 47 (36.4) and non-smokers 82 (63.6%). There was an even representation of staff across all positions, the medical staff represented 5 (3.8%), but their total numbers of staff combined are lower than all the other departments.

A paired sample t-test was conducted to compare the mean scores on willingness to change during the pre- and posttest. There were significant differences in the scores for the pretest ($m=15.19$, $SD=3.27$) and posttest ($m=47.44$, $SD=2.98$). A significant increase from pretest to final was found ($t(128)=-79.00$, $p<0.001$).

Chart audits

Fifty charts were reviewed pre-intervention and 68 charts post intervention. Pre chart audit 14 (28%) were males and 36 (72%) females. In this group 42 (84%) had quit attempts and 8 (16%) had no quit attempts. Furthermore, 34 (68%) used NRTs and 16 (32%) had not used NRTs before the project study. Compared to the post chart review group 22 (32.4%) were males and 46 (67.6%) were females. 61 (89.7%) had quit attempts and 7 (10.3%) had no quit attempt. All 68 (100%) of the patients had used NRTs per protocol. The average score on the Fagerstrom Scale was 5.88 (SD=0.324) and the scores ranged from 1 to 6. The average score on Motivational scale was 6.25 (SD=1.50) and the scores ranged from 2 to 8.

A Pearson's Correlation was conducted to assess the strength of the relationship among completing the program and being tobacco free. A significant moderate and positive relationship ($r=0.579$; $p<0.001$) among the variables; can be interpreted as participants complete the smoking cessation program they tend to be smoke free. An odds ratio was calculated to determine the odds of completing the program. The odds of completing the smoking cessation program, are high regardless of age; OR=89 (CI=0.81-0.98); therefore, all participants have an 89% chance of completing the smoking cessation program.

Discussion

Facilitators to any successful practice change project must have defined roles and responsibility. Their positions within the organization should represent all levels of organizational structure: from the development of policy and procedure to the staff level of providing program services. Therefore, it was necessary to invest time up front to prepare and address real and imagined concerns with all stakeholders, patients, staff, providers, counselors, and administration.

Challenges to the plan occurred with patients and staff. The patients were a very transient population; therefore, rigorous controls were set in place and monitored to ensure that during the data collection phase patients were not accepted more than once into the study due to multiple admissions. Due to the high non-completion rate of patients, only patients completing treatment were included in the study. Secondly, attitudes of staff may also present a barrier to this needed service. For instance, some staff hold the belief that tackling one addiction at a time is the way to go, while other are active smokers and are reluctant to implement a smoking cessation program. There is literature to suggest that a counselors' attitude may have a significant influence on intervention outcome. Variables such as counselor ratings of the importance of integrating smoking cessation into treatment, counselor knowledge and comfort level at providing smoking cessation services may present a barrier to the successful implementation of a smoking intervention project [16].

Since patient outcomes are inherently linked to counselor attitudes and personal experience with smoking (quitting) it is important to assess these attitudes. Lack of training and education has been cited as one of the most frequently reported

barriers to providing concurrent nicotine cessation treatment within treatment services [17]. All counselors attended a smoking cessation educational training, to ensure that they were familiar with the components of the smoking cessation program and to provide baseline training on the materials that was provided to the participants.

Although this evidence based practice project focused on establishing a smoking cessation policy and procedure which leads to smoking abstinence at discharge, sustainability of smoke cessation is also important after discharge. A follow-up with patients who completed the intervention may be needed to assess sustaining smoking cessation after discharge and over time. Stuyt [8] conducted a year follow-up on the clients who participated in a 90-day smoking cessation program, found that patients' abstinence rates decreased from 86% to 73%, indicating that those who work at actively sustaining from smoking would more likely remain smoke free a year later.

Implication for Practice

Alcohol and drug treatment programs presents a unique opportunity for patients to address their nicotine addiction and it may help those who successfully quit smoking become more likely to achieve long-term recovery from alcohol and other drugs.

Implementing a smoking cessation program within an established drug treatment program can successfully change patient's behavior with regards to all their addiction behavior-alcohol, drugs and nicotine. The smoking paradigm is compatible to the alcohol and drug paradigm with respect to relapse, relapse triggers (people, places and things), and relapse prevention strategies. Overall a smoking cessation program has great value to this patient population. Evidence and research has shown that people who attend multiple weekly support counseling and use NRTs greatly improve their likelihood of succeeding in a smoking cessation program [10]. This project has shown that Doctoral prepared Nurse Practitioners are in a unique position to successfully implement smoking cessations programs within this setting.

Future Implications

Smoking in rehabilitation settings is a serious health issue that needs to be addressed. The issue currently being considered by the drug and alcohol treatment community is whether nicotine addiction should be incorporated into their treatment programs, and if so, should patient participation be optional. Many states such as New York have "no smoking" regulations in its alcohol and drug treatment programs. Patients entering treatment may not have considered addressing their nicotine addiction is being forced to become tobacco-free, "cold turkey". The literature shows that there is a need for more effective smoking intervention for substance abusers that smoke. Bobo et al. found that alcohol smokers with high dependence on nicotine are less likely to attempt smoking cessation. Non-smoking policies in substance abuse programs provide a way for service workers

to express their concerns for the health of the clients and staff. The implementation of the “no smoking” regulation in New York State requiring all treatment programs to be smoke free, is not without its share of controversy. On one hand the State is to be commended for addressing such an important public health issue such as this head on.

There are many potential opportunities for continuation of this project. Immediate implications include the expansion of the project to other inpatient substance abuse facilities, creating an opportunity for NP lead leadership in carrying out programs such as this. The intention of this project was to provide clinical staff with the tools to facilitate and implement a tobacco smoking cessation program. To sustain the project going forward, a mentorship system was established. This facility currently employs APNs who was chosen to continue to guide and support the practice change. By monitoring outcomes these mentors could assess for any needed refinement of the practice change, implement these changes and continue to monitor, work directly with the front-line staff to educate about evidence base practices and maintain enthusiasm for the change practice. These mentors will be able to assess changes in the organizational culture and provide specific interventions to address these changes following

the ARCC model [11,12]. Making the guidelines of the project as a standard of work and in-cooperating them into the policies and procedures of the organization is another way to ensure sustainability over time.

Conclusion

Most often, substance abuse treatment focuses on treatment of the presenting substance (alcohol or drugs) rather than tobacco. Barriers identified for this lack of utilization include: Staff attitudes about and use of tobacco; lack of adequate training of staff to address cessation efforts; fears among staff and administration regarding tobacco policies and census; and limited treatment resources. There is significant recognition that an integrated approach to smoking cessation is important to offer patients who smoke and reside in in-patient substance abuse rehabilitation settings. Given that 70-80% of patients receiving substance abuse services are smokers. Research shows that there are increased periods of abstinence up to 9 years when smokers quit within a year of substance abuse treatment. Research is needed to find ways to implement a system that patients continue to benefit from smoking cessation efforts after discharge.

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