


Impact of Family and Social Network on Tobacco Cessation Amongst Cancer Patients

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Abstract

Continued smoking after a cancer diagnosis adversely affects outcomes, including recurrence of the primary cancer and/or the development of second primary cancers. Despite this, prevalence of smoking is high in cancer survivors and higher in survivors of tobacco-related cancers. The diagnosis of cancer provides a teachable moment, and social networks, such as family, friends, and social groups, seem to play a significant role in smoking habits of cancer patients. Interventions that involve members of patients' social network, especially those who also smoke, might improve tobacco cessation rates. Very few studies have been conducted to evaluate and target patients' social networks. Yet, many studies have demonstrated that cancer survivors who received higher levels of social support were less likely to be current smokers. Clinicians should be doing as much as they can to encourage smoking cessation in both patients and relevant family members. Research aimed at influencing smoking behavioral change in the entire family is needed to increase cessation intervention success rate, which can ultimately improve the health and longevity of patients as well as their family members.

Keywords

smoking cessation, support system, cancer diagnosis, tobacco cessation, family support, family network, cancer patient, social network, social support, cancer survivor

Many cancers are directly related to smoking, such as lung, head and neck, bladder, cervix, esophageal, kidney, and pancreatic cancers, accounting for 40% of all cancer-related deaths.¹ Smoking is the most preventable cause of cancer deaths. Continued smoking after cancer diagnosis has been associated with poorer quality of life and psychosocial status.^{2,3} It has also been shown to adversely affect outcomes by increasing the risk for treatment complications, recurrence, and second primary cancers.^{4,5} On the contrary, smoking cessation results in improved outcomes with surgery, radiation reduction, and systemic therapy.⁵⁻⁷ A systemic review of smoking cessation on early-stage lung cancer prognosis found that five-year survival rates in 65-year-old patients was 33% in continued smokers compared with 70% in those who stopped, thereby highlighting the importance of smoking cessation amongst cancer patients.⁶ In addition, in those with early-stage primary lung cancer, results showed that continued smoking was associated with a significantly increased risk of all-cause mortality (HR = 2.94, 95% CI 1.15–7.54) and recurrence (1.86, 95% CI 1.01–3.41).⁶

Despite these known facts, continued smoking after diagnosis of cancer is as prevalent in cancer patients as in the general population.⁸ Continued smoking is even more prevalent in those with tobacco-related malignancies than others.⁹ In one study, smoking prevalence was 27% amongst tobacco-related malignancies compared to other cancer survivors (16%) and those without cancer (18%).¹⁰ In one large retrospective study prepared by The Korean National Health Insurance Service, 51.6% continued to smoke after cancer diagnosis.¹¹ Paul found in a cohort of 1444 people that only 37% of the self-reported smokers at diagnosis had quit six months

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post-diagnosis.¹² In another study, 43.96% of cancer survivors successfully quit smoking at cancer diagnosis.¹³ Even amongst cancer survivors who quit smoking after diagnosis, relapse rates are quite high. Studies have reported relapse rates of 50–80% in survivors.^{8,14,15}

Higher abstinence rates have been seen in patients who received cessation intervention within 3 months of their cancer diagnosis; starting cessation treatment as soon as possible is thought to be critical.^{7,16} Diagnosis of cancer provides a teachable moment and a window of opportunity to initiate successful smoking cessation intervention.^{17,18} Understanding the challenges and barriers particularly during this early phase of cancer diagnosis is of paramount importance. In this commentary, we focus on two of the frequently cited influences, which are living amongst smokers and the impact of social networks on smoking cessation.^{19–21}

Decisions to quit smoking have been shown to be strongly influenced by social factors, such as friends, family, and social groups. In one study, former smokers living in a smoke-free home had 60% lower odds of relapse compared with those living in homes that allowed smoking (adjusted OR = .40; 95% CI .25–.64).²² A large prospective study focusing on quit rates containing 53,650 current female smokers in 2001 reported their smoking status 4 years later.²³ The study reported that smokers who were partnered (i.e., cohabitating with someone and/or married) were more likely to quit (OR = 1.13, 99% CI 1.06–1.19) and those who had a non-smoking partner throughout the 4 years were even more likely to quit (OR = 2.01, 99% CI 1.86–2.17). Furthermore, those who had a partner who smoked at baseline and quit during the 4 years had an even higher likelihood to quit (OR = 6.00, 99% CI 5.41–6.67). Social influence is important in socially disadvantaged adults as well. In a study exploring socioeconomically disadvantaged adults, participants were more likely to smoke on days when offered a cigarette compared to days when no such event occurred (OR = 3.3, 95% CI 1.21–9.06).²⁴

Patients who are diagnosed with cancer face similar challenges, and targeting relatives of cancer patients is a particularly interesting focus since smoking often occurs in social groups, including within family clusters which influence its members through modeling effects and shared social environments.²⁵ In addition, family members of patients with smoking-related cancers may have higher risk for developing cancers and other smoking-related diseases compared to the general population.^{26–28}

Very few studies have been conducted to evaluate and target patients' social networks. Wells et al.²¹ found that smoking cessation support amongst patients with cancer and their relatives are insufficiently integrated into the care pathway. Although patients diagnosed with cancer are often advised to stop smoking, little attention has been directed to reduce tobacco use amongst their social support system.²⁹ Compared to non-cancer diagnoses, it has been proposed that life-threatening health events create a "teachable moment" where relatives may be more receptive to smoking cessation interventions.³⁰ However, social support is often not considered in smoking cessation

programs and few programs have been designed with relatives in mind, and those that have been piloted have had mixed results, mainly because of ambiguous study methods and inability to complete the study as planned.³¹ Some of such studies and their pitfalls are detailed.

A study by Poghosyan et al.³² found that cancer survivors who received higher levels of social support were less likely to be current smokers than those who received lower levels of social support. However, this study did not specify the details of social support. Perceived social support, as measured by Duke-UNC Functional Social Support Questionnaire, was also found to be positively correlated with smoking cessation in cancer patients in a nationwide, multicenter survey conducted with 493 participants who were smoking at the time of cancer diagnosis.³³ This study also did not specify the details of social support aside from what was measured in the Duke-UNC Questionnaire. The review article by Ehrenzeller et al.³⁴ identified significant variables among survivors who continued to smoke vs those who successfully quit after a cancer diagnosis. The authors found that survivors who are younger, female, without a partner, and with less self-reported socioeconomic and psychosocial support may be at greater risk for continued smoking. These variables highlight the importance of psychosocial support as a modifiable factor that contributes to continued smoking. However, again, this study did not evaluate smoking habits of those in the social network. Nevertheless, all these studies highlight the impact of social network and support in successful cessation programs. Additionally, some studies have shown that cognitive behavioral therapy and peer counseling can be beneficial, again highlighting the importance of psychosocial support. Simmons et al.³⁵ performed a study with 412 newly diagnosed cancer patients and randomized them to usual care (UC) or a smoking-relapse prevention (SRP) program. It revealed that for the 2- and 6-month time points, patients who were married or partnered were more likely to be abstinent after SRP than UC ($P = .03$).

Fewer studies have evaluated the impact of cancer diagnosis on relatives and friends of cancer patients. Schnoll et al.³⁶ explored how a cancer diagnosis can be a teachable moment for smokers and treating nicotine dependence among patients' relatives. The authors recruited 234 relatives and found that oncology patients' relatives were significantly more likely to enroll in a smoking cessation program compared to a control group of non-cancer orthopedic relatives (75 vs 60%; OR = 1.96, 95% CI 1.07–3.61, $P = .03$). However, the oncology relatives were not more likely to remain in a cessation program (61 vs 52%; $P > .05$) or quit smoking (19 vs 26%; $P > .05$). This study demonstrated that cancer diagnosis of relatives is a teachable moment. However, it also identified challenges in maintaining smoking abstinence, such as levels of psychological distress, nicotine patch adherence, and perceptions of benefits related to smoking that are involved in successfully engaging relatives of smokers in a smoking cessation program. Providing continued support for smokers and support systems of smokers who initially quit smoking following a

cancer diagnosis could have a meaningful impact to decrease smoking recurrence. Additional barriers to smoking cessation amongst family members of cancer patients include increased stress experienced following a diagnosis; a desire to maintain personal control and a sense of “normal” self; lack of belief in or acceptance of the connection between smoking, cancer, and health; and lack of meaningful discussions with health professionals about smoking.²¹ One study indicated that family members are clearly affected by a cancer diagnosis; however, it did not serve as a completely effective impetus for close family members to quit or reduce smoking.²² In a small study of 14 families, lack of smoking cessation was attributed to distancing oneself from the diagnosis and belief that quitting is an individual choice.²⁹ That study highlighted the importance of taking family dynamics, gender roles, and self-identities into account when designing interventions.

A relatively recent study which focused on family dynamics, though not cancer-related, is worthy of mention. This study was presented at European Association of Preventive Cardiology meeting in April 2019. It reported a six-fold increased chance of successful smoking cessation when married and cohabiting couples participated in a smoking cessation program together compared with those who did it alone.³⁷ In another study conducted at the UNC Tobacco Treatment Program, they examined the feasibility of implementing a family systems approach to quitting. It reported a statistically significant increase after six-month follow-up for patients with family integration 28% (N = 56/200) compared to 23% (N = 67/291) ($P = .105$) for patients without family integration.³⁸ Other studies found that among married couples, when one spouse stopped smoking the other spouse was 67% less likely to continue smoking.³⁹ Further lending support to interventions targeting the patient–family unit, Bottorff et al.⁴⁰ found that family members of patients with lung cancer diagnosis often continued to smoke, creating friction and distress between cancer patients and their families, and highlighting the importance of studying interventions that have worked. In this report, the cancer patients failed to confront family to quit, desiring instead to maintain harmony and connections rather than risk relationships. Examining family dynamics and supporting family programs could help create productive dialogue about the importance of families having a united goal.

Additional studies have explored other social support constructs. Westmass recommended focusing research on community-level or population-level factors, such as smoking restrictions, advertising, support groups, and individual counseling. Based on the opinion of these authors, these provide emotional, informational, and instrumental support although studies to date have failed to show definitive benefits. It concludes that other social support constructs, including internet and electronic technologies (e.g., text messaging, email, social networking), can tailor individual cessation treatment based on each patient’s unique profile.⁴¹

In summary, the prevalence of smoking is high in cancer survivors and higher in survivors of tobacco-related cancers.

Social network seems to play a significant role in smoking habits of cancer patients. Interventions that involve members of patients’ social network, especially those who also smoke, might improve tobacco cessation rates. Studies of this nature may also benefit members of social networks who are smokers. Since it has been shown that those family members who quit together have more success, clinicians should be encouraged to target both those with a cancer diagnosis as well as their family members who smoke, so that they may help each other. More research is needed to find better ways to influence smoking behavioral change in the entire family, which could include bespoke smoking cessation interventions that can ultimately improve the health and longevity of patients as well as their family members.

Author Contributions

MN was the main author of this article and wrote the initial draft and revisions. NS and NM provided important feedback and edits.

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