The Effects of Nurse-Led Smoking Cessation Interventions for Patients with Cancer: A Systematic Review

Cherdsak Duangchan, Alicia K. Matthews*

Abstract: Smoking among patients with cancer is associated with increased morbidity and mortality. Nurses play an important role in increasing health promoting behaviors among medically ill patients. However, best practices for smoking cessation interventions among patients with cancer have not been identified. The objective of this systematic review was to examine the effects of nurse-led smoking cessation interventions for patients with cancer. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement was used as a guideline for this review. CINAHL Plus with full text, PubMed, Scopus, Embase and PsycINFO were searched covering English publications without date restrictions. Experimental research studies were included if they were original articles, the interventions were provided by nurses and they reported quit rates. Screening and data extraction were performed systematically. The methodological quality of included articles was assessed using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies. The review included six randomized trials and six quasi-experimental studies. The quality of the included studies was mixed. The majority of interventions were brief, hospital-based and included nurse-delivered counseling. Only 41.7% of studies offered nicotine replacement therapies. Nine studies biochemically verified post-intervention quit rates. Overall quit rates for the intervention and control groups were 43.4% and 27.1%, respectively. Higher intensity interventions consisting of counselling, education materials and follow-up sessions resulted in the highest quit rates. This review suggests that nurse-led smoking cessation interventions show promise. However, further research is needed to improve the methodological rigor of nurse-led smoking cessation intervention research.

Pacific Rim Int J Nurs Res 2020; 24(1) 118-139

Keywords: Cancer survivors, Interventions, Nursing, Smoking cessation, Systematic review, Tobacco

Received 7 April 2019; Revised 28 June 2019 ;Accepted 27 July 2019

Correspondence to: ***Cherdsak Duangchan****, RN, MSN, Doctoral student, Department of Health System Sciences, University of Illinois at Chicago College of Nursing, Chicago, Illinois, USA.
E-mail:cduang2@uic.edu
Alicia K. Matthews, PhD, Professor, Department of Health System Sciences, University of Illinois at Chicago College of Nursing, Chicago, Illinois, USA. E-mail:aliciak@uic.edu*

Introduction

National estimates in the United States suggest that 13% of cancer survivors aged 18 years and older are current smokers.[1] However, smoking rates vary considerably by demographic and disease characteristics.

For example, age is a significant correlate of smoking status following a cancer diagnosis with the highest rates reported among cancer survivors between the ages of 18-44 years (26.6%) compared to those aged 45-64 years (20%), and those aged 65 years and older (6.7%).[1] Smoking rates also vary considerably by cancer diagnosis with smoking rates highest among patients diagnosed with cervical (31%), head and neck (29%), prostate (29%), bladder (27%), and lung cancers (24%).[2] Research findings suggest that the majority of patients with cancer who smoke at diagnosis continue to smoke after treatment.[3] Continued smoking among newly diagnosed patients with cancer and among cancer survivors contributes to adverse health outcomes[4,5] including an increased risk of cancer recurrence, development of new primary tumors and elevated risk for other smoking-related diseases such as cardiovascular disease.[6] Further, continued smoking increases the risk of side effects associated with chemotherapy and radiation therapy,[7] postoperative complications,[8] poor quality of life,[9] and cancer-specific and all-cause mortality.[2]

Diagnosis and treatment of a potentially life-threatening illness such as cancer has been identified as an important "teachable moment" for increasing motivation and interest in making health behavior changes such as smoking cessation.[10,11] To capitalize on increased motivations for health behavior change among medically ill populations, smoking cessation interventions delivered in health care settings may be effective strategies for reducing smoking prevalence rates among cancer survivors. To that end, the Joint Commission on Accreditation of Healthcare Organizations in the U.S. implemented new Tobacco Treatment performance measures for hospitals.[12] The Joint Commission that health providers identify all tobacco users, that they be offered both counseling and medications during the hospitalization and upon discharge, and that providers assess post-discharge smoking status.[12] However, best practices for smoking cessation treatments among patients with cancer have not been established.

Review of the Literature

Nurses play a potentially vital role in addressing smoking cessation among hospitalized patients with cancer[13] due to the amount of personal contact they have with hospitalized patients,[14] their primary role responsibilities of patient education and health promotion,[15] and the relative cost-effectiveness of health care services provided by nurses compared to physicians.[16] A recent study has demonstrated the importance of nursing's role in achieving the Joint Commissions' Tobacco Treatment performance measure targets. Shelly and colleagues[17] conducted an evaluation of a multi-level smoking cessation intervention conducted in two large U.S. hospitals. The study examined the benefits of electronic health record (EHR) notification system paired with a nurse-led tobacco screening and counseling program that was integrated into routine nursing care. Study findings showed a 10-fold increase in providing and charting of nurse-delivered counseling (OR = 10.54, 95% CI, 7.87-14.12).[17] Results from a recent meta-analysis and systematic review confirm the benefits of nurse-led smoking cessation interventions for improving smoking cessation rates among diverse populations of hospitalized patients.[13,18]

Among patients with cancer who smoke, two prior systematic reviews and one meta-analysis have examined the effectiveness of smoking cessation interventions.[19-21] The interventions in these reviews were delivered by a variety of health professionals including physicians, dentists, health counsellors/educators, tobacco treatment specialists and nurses. Primarily, interventions were with adults diagnosed with smoking-related cancers and who were undergoing treatment. Smoking cessation intervention approaches included brief advice to quit, individual counseling, combined pharmacotherapy and counseling, and intensive, multicomponent interventions. In the first review conducted by Cooley and colleagues,[19] only two of the 19 studies included in the review

reported statistically significant differences in smoking cessation outcomes between intervention and control groups. High intensity and multicomponent interventions (e.g., medications, counseling, and education) were the most successful for supporting oncology patients in quitting smoking.[19] The second review focused on smoking cessation interventions for head and neck patients with cancer only.[20] In that review, only three studies were identified that met study inclusion criteria and the methodological quality of the studies were weak. Of the studies included in the review, only one reported significant improvement in cessation rates at follow-up. In the final review,[21] eight randomized clinical trials examining smoking cessation interventions in cancer patient populations were examined. Findings did not support the benefits of the interventions compared to usual care for either short term (OR = 1.54, 95% CI, 0.91-2.64) or long-term outcomes (OR = 1.31, 95% CI, 0.93-1.84).[21] Although nurse-led interventions were included in each of the prior reviews, there is no clear understanding of the effects of nurse-led smoking cessation interventions among patients with cancer.

Specific Aims

Prior research supports the benefits of inclusion of smoking cessation treatment as part of routine nursing care for hospitalized patients. However, to date, no systematic reviews have been conducted which specifically focus on nurse-led smoking cessation interventions for oncology populations. Further, little is known about the types of nurse-led interventions that have been conducted, the timing and location of those interventions, the cancer populations that have been targeted on the benefit of treatments delivered. For these reasons, a systematic review was conducted to evaluate the effects of nurse-led smoking cessation interventions among patients with cancer, as well as to identify any gaps in knowledge. Findings from this review have implications for the development of evidence-based nursing clinical practice guidelines for reducing the detrimental effects of continued smoking among patients with cancer.

Methods

Design: This systematic review was reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement[22] comprised of a 27-item checklist and a four-phase flow diagram.

Ethical considerations: This study did not include human subjects and was exempt from review by the Institutional Review Board of the University of Illinois at Chicago.

Eligibility criteria: Articles were eligible for inclusion in this review if they met the following inclusion criteria: (1) examined the effects of smoking cessation interventions; (2) identified nurses as a part or main smoking cessation programs' provider; (3) included adults diagnosed with cancer (4); reported abstinent rates; (5) were published in English language; (6) used experimental research approaches including randomized control trial (RCT), quasi-experimental design (nonequivalent comparison group design, and quasi-experimental design (prospective, one group repeated measures design); and (7) were original research articles. Consistent with the recommendation of Albarran, 23 (p.262) in this systematic review, we will operationally defined nurse-led as "...a nurse is responsible for the overall co-ordination, management and continuity of care for a specific episode of treatment or intervention."

Exclusion criteria included cases in which the participants were family members or caregivers of patients with cancer. Conference proceedings, published abstracts, letters to editors, unpublished studies, dissertations, literature review articles, and book chapters were also excluded from this review. The authors made the decision to exclude these sources

for the following reasons: (a) not primary source materials; (b) not peer-reviewed empirical research studies; and (c) insufficient details to evaluate methods and quality of research findings.[24]

Primary outcome: Smoking cessation was the primary outcome. Smoking cessation could be assessed via self-report (e.g., surveys) or biochemical measures (e.g., carbon monoxide or saliva cotinine assessment). Quit outcomes examined included short-term quit outcomes (≤ 3-month post-intervention), intermediate quit outcomes (6 months) and long-term smoking cessation outcomes (12 months).[25-27] When available, we also extracted additional measures of change in smoking behaviors reported in intervention outcomes including changes in the numbers of cigarettes smoked per day, number of quit attempts, and intention to quit.

Information sources: The electronic databases listed below were searched for studies published until November 2018: Cumulative Index to Nursing and Allied Health Literature (CINAHL plus with full text), MEDLINE via PubMed and Scopus, Embase and PsycINFO. Specific journals and reference lists of previous studies was also examined.[25,29] The mapping medical subject heading (MeSH) terms that were consistent with the aims of this study were used for the initial search strategy. Search terms were 'smoking cessation', 'nurses', 'nursing intervention', 'patients with cancer', and 'cancer survivors.' There was no date restriction due to the limited number of overall studies.

Study selection: Retrieved titles and abstracts were exported to a RefWorks reference manager and where present, duplicates were removed. An initial screening of titles and abstracts of potential papers was undertaken by the first author to determine eligibility. Full texts of potential papers were then obtained and further reviewed for eligibility criteria by two independent reviewers (C.D. and A.M.). Discrepancies were resolved by discussion and consensus. The process of literature identified at each stage is summarized in the PRISMA flow diagram recorded in **Figure 1.**

Data extraction: The review matrix method was used to extract relevant information from each article.[24] **Tables 1 and 2** show the characteristics of each of the identified articles including author's name, year of publication, location, aim of the study, study design, sample, type of intervention, nurses' role in the intervention, comparison group, setting, timing, outcome measurement, selected result, and quality rating.

Assessment of methodological quality: The Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies[29] was used to evaluate the methodological quality of included studies. The EPHPP can be used to assess the quality of both experimental and non-experimental studies. This tool covers six components including selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts. First, each of the six components were rated on a three-point scale (1 = strong, 2 = moderate, 3 = weak) according to a standardized criteria and dictionary. Next, an overall global quality rating was determined basing on the six component ratings. An overall rating of strong was defined as having no weak ratings and at least four strong ratings. An overall rating of moderate was defined as one weak rating and less than four strong ratings. A rating of weak was defined as receiving two or more weak ratings across the six evaluation components. The methodological quality assessments were independently conducted by the two authors.

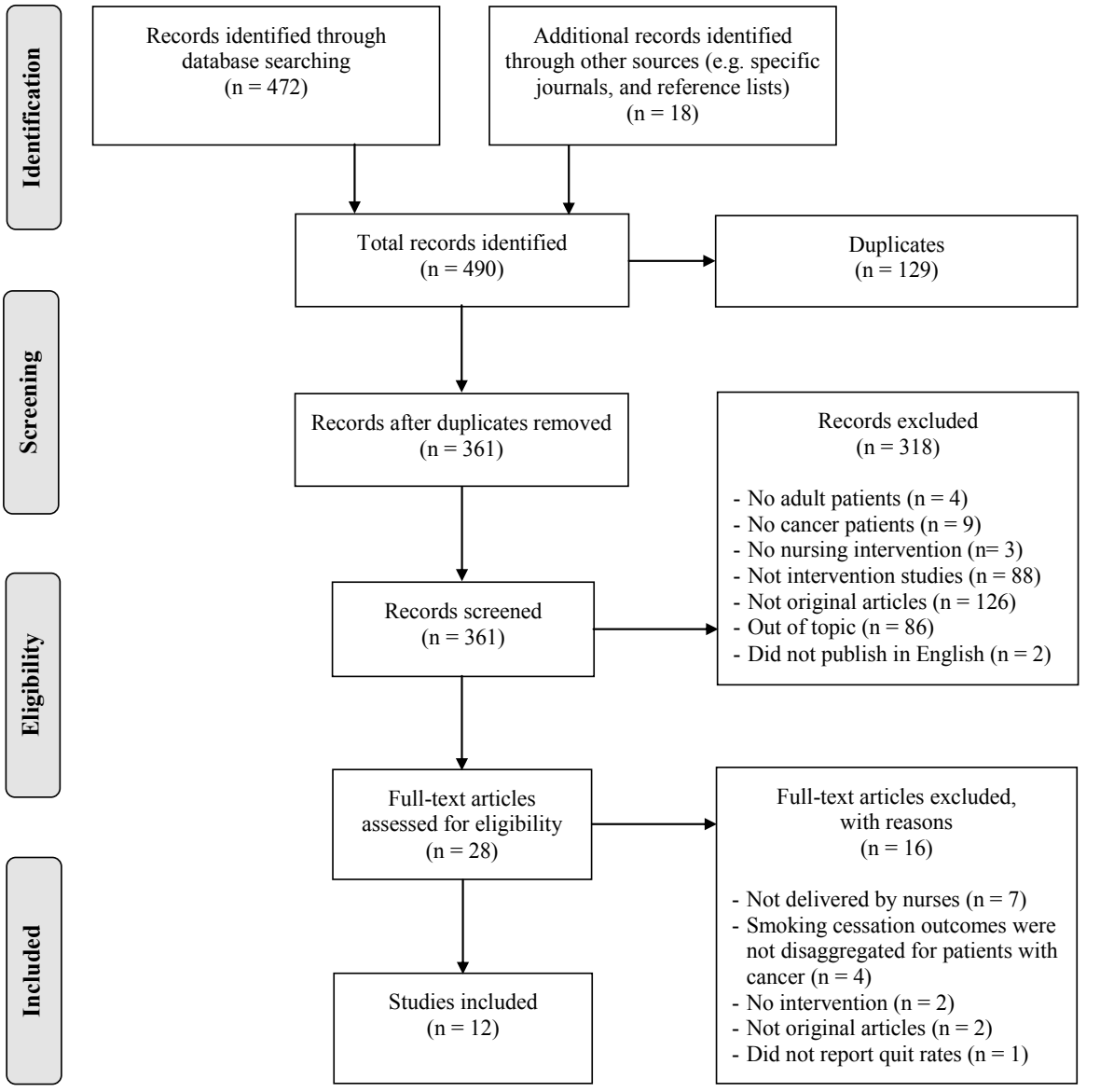


Figure 1. PRISMA flow diagram

Results

Search results: A total of 490 articles were identified based on our initial database search with 361 articles remaining after duplicates were removed **(See Figure 1)**. Of those, 318 were excluded after an initial screening of titles and abstracts. Reasons for exclusion included non-adult participants (n = 4), non-patients with cancer (n = 9), non-nursing interventions (n = 3), not intervention studies (n = 88), not original articles (n = 126), not focused on smoking cessation (n = 86), and published in a language other than English (n = 2). Twenty-eight were selected as relevant articles based on titles and abstracts, full texts were then assessed. Sixteen articles did not meet eligibility criteria and were excluded based on the following: (1) intervention not delivered by a nurse (n = 7); (2) smoking cessation outcomes were not disaggregated for patients with cancer (n = 4); (3) non-intervention study (n = 2); (4) not original articles (n = 2); and (5) quit rates not reported (n = 1).

Study characteristics: A description of the trial characteristics of included studies is displayed in **Table 1**. A total of twelve published articles were reviewed for this systematic review with a combined total of N = 1,963 patients with cancer. The included studies were published between 1994 and 2018. All included studies were based in either hospital inpatient or out-patient settings. Six of the included studies used a RCT design,[30-35] two used a quasi-experimental design (nonequivalent comparison group design),[36,37] and four were a quasi-experimental design (prospective, one group repeated measures design).[38-41] Nine of the 12 included studies were published in the United States [30-32,34-39] with one study each conducted in the Netherlands,[41] Hong-Kong,[33] and Sweden.[40] The majority of studies (n = 8) were conducted in homogenous cancer populations including lung cancer,[37,38] head and neck cancers,[35,36,39,40] and combined lung and head and neck patients with cancer.[31,41] Three additional studies included patients with a variety of cancer diagnosis[32-34] and the final study included a mix of oncology, cardiology, and general surgery patients.[30]

Methodological quality assessment: Ratings of methodological quality for each study are reported in **Table 1**. Based on the EPHPP, [29] four of the studies received a quality rating of weak,[35,39-41] six studies a quality rating of moderate,[32-34,36-38] and two studies a quality rating of strong.[30,31] Common threats to validity and reliability included: (1) lack of a control condition;[38-41] (2) limited information about usual care conditions;[30,38-41] (3) lack of information on blinding of participants or data assessors;[34-37,39-41] (4) the potential for selection bias due to high participant refusal rates (42%-44%);[32,35,39] (5) failure to determine whether the background characteristics were similar for the intervention and usual care groups;[38,39,41] and (6) lack of biochemical verification of self-reported smoking status.[35,36,41]

Treatment setting: All of the studies were conducted in health care settings. Six of the studies were conducted in outpatient departments such as cancer clinics, eye, nose and throat clinics, surgery, or smoking cessation treatment clinics.[33,35-37,39,41] Five of the studies were conducted in inpatient units[30-32,38,40] and one study was conducted across both inpatient and outpatient clinics.[34]

Treatment initiation: The timing of smoking cessation treatment initiation varied across studies. The majority of studies (n = 5) initiated the interventions during the immediate post-operative recovery period for patients undergoing diagnostic surgery or surgical resection of tumors.[30-32,37,38] Additionally, four of the reviewed studies initiated treatment as part of ongoing outpatient cancer care.[33,35,36,41] The final two studies initiated the smoking cessation intervention prior to a hospitalization for a surgical procedure[34,39] and one initiated treatment during the course of outpatient radiation treatment.[40]

Intervention approaches. All studies were nurse led and offered individual face-to-face

Table 1. Review of the literature about nurse-led smoking cessation interventions in patients with cancer

Author Year Country	Aim	Design	Sample	Intervention	Nurses' role	Usual care	Setting	Intervention initiation	Outcome measurement	Selected results: Quit rates			Quality rating
										Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
Stanislaw et al[31] 1994 USA	"To determine the effectiveness of a nurse-delivered structured smoking cessation intervention on short-term smoking abstinence in hospitalized surgical cancer patients"[31(p82)]	RCT	26 surgical patients with cancer	1. Individual counselling Sessions = 3 Duration = 20-30 mins 2. Education & material (booklet, audiotape) 3. Telephone follow-up Sessions = 5 Duration = N/A	1. Develop & evaluate intervention 2. Delivery intervention 3. Assess smoking status	1. A brief counseling	IPD	During a hospitalization for treatment	1. Saliva cotinine levels	I = 75% (9/12) C = 42.9% (6/14) $p < .10$	N/A	N/A	Strong
Wewers et al[30] 1994 USA	"To determine the effectiveness of a nurse-delivered structured smoking cessation intervention on short-term smoking abstinence among hospitalized postoperative patients"[30(p152)]	RCT	30 patients with cancer	1. Individual counselling Sessions = 3 Duration = 20-30 mins 2. Education & material (booklet, audiotape) 3. Telephone follow-up Sessions = 5 Duration = N/A	1. Develop & evaluate intervention 2. Delivery intervention 3. Assess smoking status	N/A	IPD	During a hospitalization for treatment	1. Saliva cotinine levels	I = 64.3% (9/14) C = 50% (8/16) $p < .01$	N/A	N/A	Strong
Wewers et al[38] 1997 USA	"To determine the effectiveness of a nurse-managed smoking cessation intervention"[38(p1419)]	QE (prospective, one group repeated measures)	15 patients with lung cancer	1. Individual counselling Sessions = 3 Duration = 20-30 mins 2. Education & material (booklet, audiotape) 3. Telephone follow-up Sessions = 5 Duration = N/A	1. Develop & evaluate intervention 2. Delivery intervention 3. Assess smoking status	N/A	IPD	During a hospitalization for treatment	1. Saliva cotinine levels	I = 40% (6/15) C = N/A	N/A	N/A	Moderate • Confounders (cannot tell the differences between groups prior to the intervention)
Griebel et al[32] 1998 USA	"To determine the effect of a nurse-managed minimal smoking-cessation intervention among patients with cancer hospitalized for surgery"[32(p898)]	RCT	28 surgical patients with cancer	1. Individual counselling Sessions = 1 Duration = 20 mins 2. Education & material (booklet) 3. Telephone follow-up Sessions = 5 Duration = 10 mins	1. Develop & evaluate intervention 2. Delivery intervention 3. Assess smoking status	1. Materials	IPD	During a hospitalization for treatment	1. Saliva cotinine levels	I = 21% (3/14) C = 14% (2/14) p = NS	N/A	N/A	Moderate • Selection bias (42% of patients refused to participate)
Browning et al[37] 2000 USA	"To determine the effectiveness of a nurse-managed smoking cessation intervention based on the AHCPR's Smoking Cessation Guideline in the usual practice of a lung cancer surgery clinic"[37(p1249)]	QE (non-equivalent comparison group)	25 patients with lung cancer	1. Individual counselling Sessions = 9 Duration = Brief 2. Education & material (booklet) 3. Telephone follow-up Sessions = 1 Duration = N/A 4. NRT and bupropion encouraged (not provided by nurses)	1. Develop & evaluate intervention 2. Delivery intervention	1. Asking smoking status 2. A brief counseling 3. Materials (available at the lobby)	OPD	After diagnosis	1. Expiratory CO levels	N/A	I = 71% (10/14) C = 55% (6/11) p = .38	N/A	Moderate • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)
Duffy et al[35] 2006 USA	"Developed and tested a tailored smoking, alcohol, and depression intervention for patients with head and neck cancer"[35(p2203)]	RCT	184 patients with head and neck cancer	1. Individual counseling Sessions = 11 Duration = N/A 2. Education & material (booklet) 3. NRT, bupropion, antidepressant as needed (not provided by nurses)	1. Develop & evaluate intervention 2. Delivery intervention	1. Asking smoking status 2. A brief counseling 3. Materials (handout for resources)	OPD	After diagnosis	1. Self-reported quit status (Yes/No)	N/A	I = 47% (35/74) C = 31% (19/62) $p < .05$	N/A	Weak • Selection bias (42% of patients refused to participate) • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)

Table 1. Review of the literature about nurse-led smoking cessation interventions in patients with cancer

Author Year Country	Aim	Design	Sample	Intervention	Nurses' role	Usual care	Setting	Intervention initiation	Outcome measurement	Selected results: Quit rates			Quality rating
										Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
Sharp et al[40] 2008 Sweden	"Developed and evaluated a nurse-led smoking cessation program on 50 patients with head and neck cancer undergoing radiotherapy with 1-year follow-up"[40(p114)]	QE (prospective, one group repeated measures)	50 patients with head and neck cancer	1. Individual counselling Sessions = 5 Duration = Brief 2. NRT (not provided by nurses)	1. Develop & evaluate intervention 2. Delivery intervention	N/A	IPD	After diagnosis	1. Expiratory CO levels	I = 78% (39/50) C = N/A	I = 51% (21/41) C = N/A	I = 68% (28/41) C = N/A	Weak • Confounders (cannot tell the differences between groups prior to the intervention) • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)
Gosselin et al[36] 2011 USA	"To evaluate the effectiveness of a brief staff training program on improving the delivery of tobacco cessation services to patients with head and neck cancers"[36(p578)]	QE (non-equivalent comparison group)	179 patients with head and neck cancer	1. Individual counseling Sessions = 1 Duration = Brief 2. Education & material (booklet) 3. Telephone follow-up Sessions = 1 Duration = N/A 4. NRT, bupropion, varenicline as needed (not provided by nurses)	1. Delivery intervention	1. Asking smoking status 2. Providing assistance to quit	OPD	After diagnosis	1. Self-reported quit status (Yes/No)	I = 14% (7/52) C = 13% (8/60) *p* = NS	N/A	N/A	Moderate • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)
de Bruin-Visser et al[41] 2012 The Netherlands	"Examining the effect of nurse-delivered smoking cessation program for patients with head and neck or lung cancer"[41(p659)]	QE (prospective, one group repeated measures)	145 patients with head and neck or lung cancer	1. Individual counselling Sessions = 4 Duration = 10-60 mins 2. Education	1. Delivery intervention	N/A	OPD	Anytime	1. Self-reported quit status (Yes/No)	N/A	I = 40% (58/145) C = N/A	I = 33% (48/145) C = N/A	Weak • Confounders (cannot tell the differences between groups prior to the intervention) • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable) • Data collection methods (cannot tell the reliability and validity of data collection tools)
McDonnell et al[39] 2014 USA	"To test the feasibility of a multidisciplinary, multicomponent, theory-based decision aid"[39(649)]	QE (prospective, one group repeated measures)	8 patients with lung cancer	1. Individual counseling Sessions = 4 Duration = 45 mins 2. Education & material (booklet, CD, printed sheets) 3. Telephone follow-up Sessions = 6 Duration = 15 mins	1. Develop & evaluate intervention 2. Delivery intervention	N/A	OPD	After diagnosis	1. Expiratory CO levels	I = 100% (8/8) C = N/A	I = 25% (2/8) C = N/A	N/A	Weak • Selection bias (44% of patients refused to participate) • Confounders (cannot tell the differences between groups prior to the intervention) • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)

Table 1. Review of the literature about nurse-led smoking cessation interventions in patients with cancer

Author Year Country	Aim	Design	Sample	Intervention	Nurses' role	Usual care	Setting	Intervention initiation	Outcome measurement	Selected results: Quit rates			Quality rating
										Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
Ostroff et al[34] 2014 USA	"To evaluate the efficacy of a novel, pre-surgical cessation intervention in newly diagnosed cancer patients scheduled for surgical hospitalization"[34(p737)]	RCT	185 patients with cancer	1. Individual counselling Sessions = 3 Duration = 5-45 mins 2. Education & material 3. Telephone follow-up Sessions = 2 Duration = 15-20 mins 4. NRT (not provided by nurses) 5. Pre-surgical scheduled reduced smoking	1. Delivery intervention	1. Individual counseling 2. Education & material 3. Telephone follow-up 4. NRT	OPD IPD	After diagnosis	1. Saliva cotinine levels	I = 36% (34/95) C = 34% (30/87) OR = .95 95% CI = .49-1.82 *p* = .88	I = 32% (30/95) C = 32% (28/87) OR = 1.03 95% CI = .53–2.01 *p* = 1.00	N/A	Moderate • Blinding (information about blinding of patients, facilitators, and data collectors was unavailable)
Li et al[33] 2018 China	"To study the effectiveness of a face-to-face individualized brief risk communication to encourage patients with cancer to stop smoking"[33(p2)]	RCT	528 patients with cancer	1. Individual counselling Sessions = 1 Duration = 15-30 mins 2. Education & material (booklet, leaflet) 3. Telephone follow-up Sessions = 1-2 Duration = 10-15 mins	1. Develop & evaluate intervention 2. Delivery intervention 3. Assess smoking status	1. A brief counseling 2. Material (self-help booklet) 3. Telephone follow-up	OPD	After diagnosis	1. Saliva cotinine levels 2. Expiratory CO levels	I =18.3% (49/268) C = 17.3% (25/260) *p* = NS	I = 5.2% (14/268) C = 3.8% (10/260) *p* = NS	I = 5.6% (16/268) C = 4.6 % (12/260) *p* = NS	Moderate • Withdraws and drop-outs (42.7% of participants dropped-out from the study)

*Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies[29] used to evaluate study quality.

**RCT = Randomized Controlled Trial study, QE = Quasi-Experimental study OPD = Outpatient department, IPD = Inpatient department, CO = Carbon monoxide, I = Intervention group, C = Control group, NS = No statistically significant, N/A = Not applicable, AHCPR = Agency for Health Care Policy and Research, Strong = no weak ratings, Moderate = one weak rating, Weak = two or more weak ratings

counseling as the primary treatment delivery modality. The average number of counseling sessions was 4, ranging from 1 to 11. The duration of counseling varied, the average time per session was 28 minutes, ranging from 5 to 60 minutes per session. In addition to counseling, the majority of studies (n = 11) also provided patients with educational materials such as booklets, audiotapes, DVDs, and printed informational materials.[30-39,41] Nine intervention approaches also included follow-up or booster sessions in the form of either telephone or in person sessions.[30-34,36-39] Although nicotine replacement therapy (NRT) has been shown to improve smoking cessation outcome rates[42] and is consistent with recommended best practice for smoking cessation treatment, only five of the included studies offered pharmacological assistance (Nicotine Replacement Patches, Bupropion or Varenicline).[34-37,40] In each of the studies that included NRT, pharmacological management was overseen by physicians and not nurses.

Control conditions: Control group conditions for each of the RCT was described as "standard of care" for oncology patients. However, details about what constituted standard of care were largely missing.[30,38-41] Among the remaining studies, standard of care was variously described. For example, asking smoking status, brief counseling, and education was described as standard of care in two studies.[35,37] Brief counseling, educational materials, and telephone follow-ups were reported in Li et al.[33] One study included two activities including asking smoking status and providing assistance to quit.[36] Two studies included only one activity such as brief counseling[31] and educational materials.[32] Finally, in one study, enhanced standard of care was described as including non-pharmacological strategies (counselling, education, and telephone follow-up) combined with NRT.[34]

Measurement of smoking status. The definition of smoking status was most commonly defined as 7-day point prevalence abstinence.[43] That is, no smoking, not even a puff for the past seven days. However, four of the twelve studies did not provide an operational definition of abstinence.[35,36,39,41] Consistent with smoking cessation treatment evaluation best practices,[42] the majority of studies conducted biochemical verification of smoking status. Biochemical verification was determined by saliva cotinine levels in five studies,[30-32,34,38] expired carbon monoxide levels in three studies,[37,39,40] and combined saliva cotinine and expired carbon monoxide levels in one study.[33] Three of the studies relied exclusively on patient self-report to establish quit status.[35,36,41]

Smoking cessation assessment time points: Smoking cessation intervention best practices includes the determination of quit status immediately post treatment and during subsequent follow-up periods.[42] Short-term outcomes (≤ 3-month follow-up period) were most commonly reported (n = 5),[30-32,36,38] followed by intermediate outcomes (6 months) (n = 2).[35,37] Each of the remaining studies reported smoking cessation outcomes from multiple assessment outcomes.[33,34,39-41] Only three of the twelve studies included long-term outcomes (12 months or greater).[33,40,41]

Effects of Smoking Cessation Interventions

Table 2 displays a summary of smoking cessation outcomes. In general, the average overall quit rates across all studies was 37.4% (range 3.8% to 100%). Only one of the four RCT studies in the review obtained statistically significant differences in smoking cessation rates between the intervention and control groups ($\overline{X}$= 64.3% vs. = 50%, $p < .01$).[30] The remaining three RCT studies reported non-statistically significant differences in quit rates between the experimental and control groups.[31-33] Both quasi-experimental studies (nonequivalent comparison group design) showed non-statistically significant differences in quit rates between the

Table 2. Quit outcomes by intervention type

Intervention types	Author Year	Intervention	Quit rates			Outcome measurement
			Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
Counselling + Education	de Bruin-Visser et al[41] 2012	1.Individual counselling Sessions = 4 Duration = 10-60 mins 2.Education	N/A	I = 40% (58/145) C = N/A	I = 33% (48/145) C = N/A	Self- report
Counselling + Education + Follow-up	Stanislaw et al[31] 1994	1.Individual counselling Sessions = 3 Duration = 20-30 mins 2.Education & material (booklet, audiotape) 3.Telephone follow-up Sessions = 5 Duration = N/A	I = 75% (9/12) C = 42.9% (6/14) $p < .10$	N/A	N/A	Biochemical verification
	Wewers et al[30] 1994	1.Individual counselling Sessions = 3 Duration = 20-30 mins 2.Education & material (booklet, audiotape) 3.Telephone follow-up Sessions = 5 Duration = N/A	I = 64.3% (9/14) C = 50% (8/16) $p < .01$	N/A	N/A	Biochemical verification
	Wewers et al[38] 1997	1.Individual counselling Sessions = 3 Duration = 20-30 mins 2.Education & material (booklet, audiotape) 3.Telephone follow-up Sessions = 5 Duration = N/A	I = 40% (6/15) C = N/A	N/A	N/A	Biochemical verification
	Griebel et al[32] 1997	1.Individual counselling Sessions = 1 Duration = 20 mins 2.Education & material (booklet) 3.Telephone follow-up Sessions = 5 Duration = 10 mins	I = 21% (3/14) C = 14% (2/14) p = NS	N/A	N/A	Biochemical verification

Table 2. Quit outcomes by intervention type

Intervention types	Author Year	Intervention	Quit rates			Outcome measurement
			Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
	McDonnell et al[39] 2014	1. Individual counseling Sessions = 4 Duration = 45 mins 2. Education & material (booklet, CD, printed sheets) 3. Telephone follow-up Sessions = 6 Duration = 15 mins	I = 100% (8/8) C = N/A	I = 25% (2/8) C = N/A	N/A	Biochemical verification
	Li et al[33] 2018	1. Individualized counselling Sessions = 1 Duration = 15-30 mins 2. Education & material (booklet, leaflet) 3. Telephone follow-up Sessions = 2 Duration = 10-15 mins	I =18.3% (49/268) C = 17.3% (25/260) *p* = NS	I = 5.2% (14/268) C = 3.8% (10/260) *p* = NS	I = 5.6% (16/268) C = 4.6 % (12/260) *p* = NS	Biochemical verification
Counselling + Pharmacology	Browning et al[37] 2000	1. Individual counselling Sessions = 9 Duration = Brief 2. Education & material (booklet) 3. Telephone follow-up Sessions = 1 Duration = N/A 4. NRT and bupropion encouraged (not provided by nurses)	N/A	I = 71% (10/14) C = 55% (6/11) *p* = .383	N/A	Biochemical verification
	Duffy et al[35] 2006	1. Individual counseling Sessions = 11 Duration = N/A 2. Education & material (booklet) 3. NRT, bupropion, antidepressant as needed (not provided by nurses)	N/A	I = 47% (35/74) C = 31% (19/62) *p* < .05	N/A	Self-report

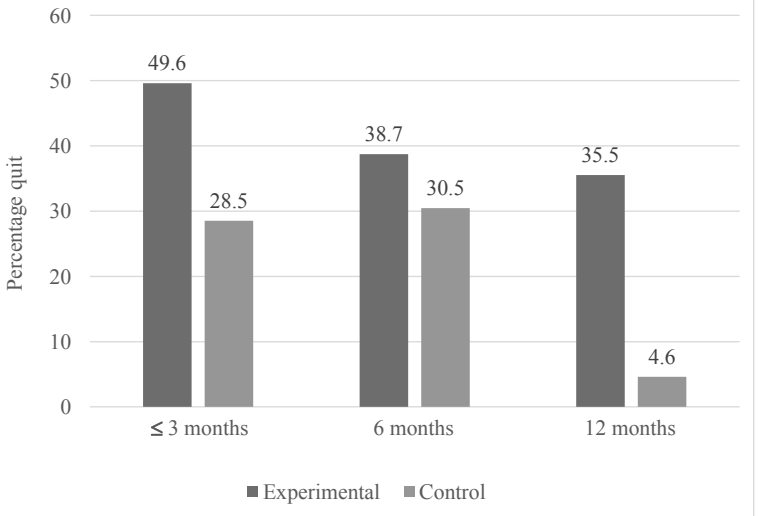
Table 2. Quit outcomes by intervention type

Intervention types	Author Year	Intervention	Quit rates			Outcome measurement
			Short-term (≤ 3 months)	Intermediate (6 months)	Long-term (12 months)	
	Sharp et al[40] 2008	1.Individual counselling Sessions = 5 Duration = Brief 2.NRT (not provided by nurses)	I = 78% (39/50) C = N/A	I = 51% (21/41) C = N/A	I = 68% (28/41) C = N/A	Biochemical verification
	Gosselin et al[36] 2011	1.Individual counseling Sessions = 1 Duration = Brief 2.Education & material (booklet) 3.Telephone follow-up Sessions = 1 Duration = N/A 4.NRT, bupropion, varenicline as needed (not provided by nurses)	I = 14% (7/52) C = 13% (8/60) *p* = NS	N/A	N/A	Self-report
	Ostroff et al[34] 2014	1.Individual counselling Sessions = 3 Duration = 5-45 mins 2.Education & material 3.Telephone follow-up Sessions = 2 Duration = 15-20 mins 4.NRT (not provided by nurses) 5.Pre-surgical scheduled reduced smoking	I = 36% (34/95) C = 34% (30/87) OR = .95 95% CI = .49-1.82 *p* = .88	I = 32% (30/95) C = 32% (28/87) OR = 1.03 95% CI = .53–2.01 *p* = 1.00	N/A	Biochemical verification

*I = Intervention group, C = Control group, NS = Not statistically significant, N/A = Not applicable

intervention and control groups (= 42.5% vs. = 34%, p > .05), ranging from 14% to 71% and 13% to 55%, respectively.[36,37] Although most studies did not observe statistically different quit rates between the intervention and control groups, the overall average quit rates were higher for the intervention and control groups at the three-month (= 49.6%, range 14-100% vs. = 28.5%, range 13-50%), six-month (= 38.7%, range 5.2-71% vs. = 30.5%, range 3.8-55%) and twelve-month follow-up assessments (= 35.5%, range 5.6 to 68% vs. = 4.6%, range 4.6 to 4.6%) as shown in **Figure 2.** Given the differences in study designs, intervention types, the intensity of treatments offered and reported outcomes, it was not possible to determine whether there was a statistically significant difference in overall interventions compared to control groups or by type of intervention tested

Figure 2. Mean smoking cessation outcomes by time



Secondary Smoking-Cessation Outcomes

In addition to the primary outcomes of quit status, a number of studies also reported on secondary smoking cessation outcomes. McDonnell et al[39] reported on differences between participants in the intervention (100%) and control group (50%) on having set a specific quit date. Two studies measured and found no group differences in self-reported quit attempts.[33,36] Three studies measured changes in the mean number of cigarettes smoked per day.[32,34,41] Only Griebel et al[32] found a reduction in daily cigarettes smoked (= 18.7 vs. = 12.1, t(28) = 2.15, $p < .05$). All secondary smoking cessation outcomes were based on self-report.

Correlates of Smoking Cessation Outcomes

Due to small sample sizes, very few of the included studies examined correlates of smoking cessation outcomes. Where included, patient's baseline demographic characteristics and smoking-related variables were most commonly examined as potential correlates of smoking cessation outcomes. Patients

diagnosed with lung[34] or laryngeal cancers[40] were more likely to successfully quit compared to other cancer types. Illness type was also a predictor of smoking cessation outcomes in a study including general hospital patients, oncology patients, and patients with cardiovascular disease. General hospital patients were less likely to quit compared to oncology patients and patients with cardiovascular disease ($X^2 = 9.21$, df = 2, $p < .001$).[30] Only older patient age was associated with an increased likelihood of quitting,[34] however, other studies did not find an association between patient demographic characteristics and quit outcomes.[38,40,41] Studies were mixed in terms of smoking-related variables. While Wewers et al[38] and Li et al[33] did not find an association between smoking-related variables (daily cigarettes smoked, previous quit attempts), de Bruin-Visser et al[41] found that having made a prior quit attempt was associated with smoking cessation results (n = 33, 69% vs. n = 14, 29%, $p < .005$). Further, Sharp and colleagues[40] found that longer use of nicotine replacement therapies resulted in marginally statistically significant improvements in quit rates ($p < .058$).

Discussion

Smoking cessation has been shown to improve health outcomes and quality of life among patients with cancer and among cancer survivors.[3] The objective of this review was to examine the effects of nurse-led smoking cessation interventions on smoking cessation rates among diverse populations of patients with cancer. Overall, a total of 12 experimental studies met the study eligibility criteria and were included in the review. However, the methodological quality of included studies was mixed with the majority of studies including at least one major limitation including the limited demographic and diagnostic diversity of study participants, the lack of an appropriate control group, small sample sizes, self-reported smoking status, lack of information about treatment fidelity and variable intensity of intervention dose within the same study. Of the reviewed studies, only two reported statistically significant differences in smoking cessation rates in the intervention compared to the treatment as usual control conditions. The results of this review highlight the importance of additional nursing research aimed at increasing the number, quality, and benefits of smoking cessation interventions for patients with cancer.

As identified in the review, nurse-led interventions were primarily targeted toward hospital-based surgical oncology patients and most specifically, patients with head and neck cancers. The timing of these interventions (pre-surgery) is appropriate given well-documented harms of continued smoking among surgical patients.[43,44] The majority of interventions targeted hospitalized pre or post-surgical patients included brief (20-30 minute) counseling sessions during the post-operative recovery period followed by additional booster sessions offered by phone. The control conditions included standard of care which typically included advice from the surgical care team to quit smoking. In the majority of studies focusing on surgical patients, high rates of smoking cessation were observed among participants in both the intervention and control groups. The changes in behaviors among both the experimental and control patients were likely due to the fact of surgical patients being diagnosed with a clearly smoking-related cancer, the documented impact of provider advice to quit on patient cessation attempts,[45] and the increased receptivity of patients with cancer to make health behavior changes at the time of a new cancer diagnosis.[11] Each of these factors suggests that targeting surgical patients is potentially a high impact window of opportunity, however, additional research is needed to improve the methodological rigor of the intervention studies tested.

The Tobacco Treatment Clinical Practice Guidelines[42] has established best practices for

smoking cessation interventions. These best practice approaches include assessment of smoking status, brief counseling, NRT and follow-up monitoring.[42] In the health care setting, the practice guidelines focus on the five major steps for providing brief smoking cessation intervention in the health care setting. Referred to as the 5A's,[46] these steps include: "(1) *ask* the patient if he or she uses tobacco; (2) *advise* him or her to quit; (3) *assess* willingness to make a quit attempt; (4) *assist* those who are willing to make a quit attempt; and (5) *arrange* for follow-up contact to prevent relapse."(p3248) With the exception of one study,[41] each of the studies reported an intervention approach that included assessment of smoking status, the provision of brief counseling, education (with/or without written handout materials) and follow-up support (face-to-face or telephone-based). However, only 41.7% of the studies provided patients with NRT. NRT is a critical component of evidenced-based smoking cessation treatments[42] and increases the likelihood of abstinence from smoking.

Based on our review, multi-component and high-intensity smoking cessation interventions that include counseling, education, NRT, and follow-up sessions appear to hold the most promise in terms of cessation rates. In our review, patients with cancer provided with intensive interventions had on average higher quit rates compared to patients who received treatment as usual. These results are consistent with the findings from the extant literature. For example, a recent Cochrane review of smoking cessation interventions for generalized hospitalized patients found that high intensity behavioral interventions delivered during hospitalization and continued for at least one month post-discharged resulted in higher smoking cessation rates compared to standard of care (RR 1.37, 95% CI 1.27-1.48).[47] The Clinical Practice Guidelines for Treating Tobacco Use and Dependence[42] has also documented the benefits of higher intensity counseling interventions compared to more minimal counseling interventions (minimal counselling interventions (≤ 3 minutes, OR = 1.3, 95% CI 1.01-1.6), low-intensity (4-10 minutes, OR = 1.6, 95% CI 1.2-2.0), high intensity interventions (≥ 10 minutes, OR 2.3, 95% CI 2.0-2.7)). Due to the time constraints of nurses in the hospital setting, the intensity of many of the interventions reviewed was increased by the distribution of printed educational materials, stress reduction audio-recordings, and repeated post-discharge telephone booster sessions.

The combination of counseling and medications (NRT, Bupropion, and Varenicline) is also effective for patients with cancer who smoke. In this review, we found that the combination interventions can enhance quitting rates among patients with cancer, with quit rates approximately 17% higher than in usual care. The finding from this review supported an update clinical practice guideline for treating tobacco use and dependence.[42] This guideline suggested that the combination of counselling and medications is more effective than counselling alone or medications alone in general populations. The quit rates for the combination of counselling and medications (OR 1.4, 95% CI 1.2-1.6) were significantly higher than medications alone. In comparison to counseling alone, the quitting rates for the combination treatment were significantly higher (OR 1.7, 95% CI 1.3-2.1). Moreover, two or more sessions of counseling with medications can significantly increase quitting rates (OR 1.4, 95% CI 1.1-1.8), with the highest quitting rate when providing more than eight sessions (OR 1.7, 95% CI 1.3-2.2).[42] However, the medications were typically prescribed by physicians, dentists and nurse practitioners. In addition to counseling, oncology nurses have a vital role in educating patients with cancer about advantages and disadvantages of using medications, and encouraging patients with cancer to use medications during the smoking cessation attempts. Also, they provide information to patients with cancer on how to use these medications correctly and safely, and help patients dealing with the side effect of medications.

Implications for Future Research and Nursing Practice

Overall, the methodological quality of studies prohibits making firm conclusions regarding nurse-led smoking cessation interventions. However, preliminary results show some promise and all patients should be offered treatment. Sarna and Bialous[48] described strategies for implementing tobacco dependence treatment programs in oncology settings. Addressing tobacco cessation will include systematic assessment of tobacco dependence. Oncology nurses should perform this assessment as part of their routine care at the initial intake session. The use of validated questionnaires will allow nurses and other health care providers to obtain consistent information about a patient's smoking status and history. The Cancer Patients Tobacco Use Questionnaire (C-TUQI) is one of the validated questionnaires developed and proposed by the National Cancer Institute Grid-Enabled Measures Database. This tool is also useful for analyzing the impact of continued tobacco use and smoking cessation on cancer treatment outcomes.

Next, education of nurses resulting in effective smoking cessation strategies is needed.[48] It is suggested that all nurses must have at a minimum of fundamental knowledge on tobacco, its toxicities, and strategies for providing tobacco independence treatment. All nurses should be continuously educated throughout their career. Nursing education should be revised by including such training as part of nursing program curriculum. Also, all new registered nurses should be trained during their orientation. For those who are already in clinical practice, on-site workshops, webinars, or routine update about changes in guideline practice should be offered. Moreover, nurses can be motivated through continuing nursing education units. In addition, nurses can have access to excellent resources due to dedication of health care organization such as WHO, National Cancer Institute, as well as cancer center.

Delivery of tobacco dependence treatment should be part of routine care.[48] Oncology nurses are able to offer bedside tobacco dependence treatment based on the guideline for their patients during hospitalization. Based on the results of this review, the ideal nurse-led smoking cessation interventions would be initiated as soon as possible after patients are diagnosed with cancer and continue during the post-discharged period. Both out-patient and in-patient units would be the possible setting for delivered smoking cessation interventions. The ideals elements of nurse-led smoking cessation interventions would be comprised of high intensity non-pharmacological approach such as counselling, education, self-help materials, telephone follow-ups, as well as pharmacotherapy. In addition, trained nurses could have authority to prescribed alternative NRT.

Further studies of nurse-led smoking cessation intervention for oncology populations are still needed to improve on the methodological rigor of previously published studies. Using RCT design with a proper theoretical framework, ensuring enough sample size, blinding of participants and outcome assessors, and using standard outcome measurement (biochemical verification) to record cessation outcomes are one of the strategies to improve quality of research. Selection bias, refusal, withdraw and dropouts, and time point of outcomes should also be considered. Further research should focus more on specific elements of nurse-led interventions in order to clarify which elements are the most effective or not useful for patients with cancer. Moreover, targeted patients with cancer with different stages of cancer and different cultures are needed. Further research in people with high risk of cancer, childhood and adolescent cancer survivors are needed. Effects of nurse-led interventions for patients with cancer' family members or care givers who smoke should also be conducted. Through the diversity of patients,

we can find that interventions in this review are effective for most patients with cancer, but it may or may not work for other groups of people. Further research is needed to examine whether oncology nurses with different competency levels account for the effects of nurse-led interventions in patients with cancer. Focusing on smoking cessation intervention initiation is also needed. Cost-effectiveness of nurse-led interventions is also important to examine. Lastly, research without barriers of nurses' roles would be of value to translate evidence to clinical practice.

Limitations

The primary limitation of the current review was the low methodological quality of available studies. Using an established tool for evaluation of methodological quality,[29] four of the studies were rated as weak and six studies were rated as moderate. The primary threats to internal validity was the lack of a control condition or randomization of study participants to treatment condition. Further, the sample sizes for many of the studies was small and the majority did not provide a power calculation to establish that the sample size was adequate for detecting a difference between the intervention and control groups, increasing the risk of Type II error. Further, the diversity of the patient demographic characteristics was also a limitation with the majority of study participants being male, head and neck patients with cancer, and White race. As such, the findings from the studies may not generalize to women, other racial and ethnic groups, and other cancer diagnoses. Although, most studies confirmed smoking status by using biochemical verification, three studies relied on self-report to determine smoking status. Prior research as suggested that self-report may overestimate actual abstinence rates by as much as 20% compared to biochemical verification.[49] Also, biochemical verification (saliva or air-expired carbon monoxide levels) was recommended as best practice for verification of smoking status for patients who smoke.[50,51] The variety of content and components of interventions, the length and number of sessions, end point, assessment time points, as well as the limit number of relevant studies prevented a quantitative synthesis of study findings. Finally, only English language publications were included in this review which may have omitted relevant studies conducted in other languages and regions.

Conclusions

In conclusion, this systematic review suggests that counselling based as per the primary smoking cessation interventions delivered by nurses may be effective for cancer populations, however, we cannot be certain due to the low-moderate quality of included studies. These findings are encouraging and suggest that nurses have a role in helping patients with cancer to stop smoking. Nurses have the ability and authority to develop, examine, and provide smoking cessation interventions. Also, smoking cessation interventions can integrate into part of routine nursing care. However, collaboration between nurses and other health professionals is the heart of implementing smoking cessation interventions among patients with cancer. Further investigation is needed to better understand and translate research to practice.

Acknowledgements

The authors would like to acknowledge funding from the HRH Princess Chulabhorn College of Medical Science, Thailand and from the University of Illinois Cancer Center, USA in the completion of this study. We would also like to acknowledge funding from the National Institutes of Health (3 U54 MD012523-03S1) in the completion of this work.

References

1. National Cancer Institute. Cancer trends progress report. Cancer survivors and smoking. 2019; Available at: https://progressreport.cancer.gov/after/smoking. Accessed January, 31, 2019.
2. Warren GW, Kasza KA, Reid ME, Cummings KM, Marshall JR. Smoking at diagnosis and survival in cancer patients. Int J Cancer. 2013 01/15; 2018/11;132(2): 401-410.
3. Cox LS, Africano NL, Tercyak KP, Taylor KL. Nicotine dependence treatment for patients with cancer. Cancer. 2003;98(5):1104-1104.
4. Parsons A, Daley A, Begh R, Aveyard P. Influence of smoking cessation after diagnosis of early stage lung cancer on prognosis: systematic review of observational studies with meta-analysis. BMJ. 2010;340(7740):251-251.
5. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. U.S. Department of Health and Human Services. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014.
6. Sitas F, Weber MF, Egger S, Yap S, Chiew M, O'Connell D. Smoking cessation after cancer. J Clin Oncol. 2014;32(32):3593-3595.
7. Peppone LJ, Mustian KM, Morrow GR, Dozier AM, Ossip DJ, Janelsins MC, et al. The effect of cigarette smoking on cancer treatment-related side effects. Oncologist. 2011;16(12):1784-1792.
8. Mills E, Eyawo O, Lockhart I, Kelly S, Wu P, Ebbert JO, et al. Smoking cessation reduces postoperative complications: A systematic review and meta-analysis. Am J Med. 2011;124(2):144-154.e8.
9. Balduyck B, Sardari Nia P, Cogen A, Dockx Y, Lauwers P, Hendriks J, et al. The effect of smoking cessation on quality of life after lung cancer surgery. Eur J Cardiothorac Surg. 2011;40(6):1432-1438.
10. Demark-Wahnefried W, Aziz NM, Rowland JH, Pinto BM. Riding the crest of the teachable moment: Promoting long-term health after the diagnosis of cancer. J Clin Oncol. 2005;23(24):5814-5830.
11. Gritz ER, Fingeret MC, Vidrine DJ, Lazev AB, Mehta NV, Reece GP. Successes and failures of the teachable moment: smoking cessation in cancer patients. Cancer. 2006;106(1):17-27.
12. The Joint Commission. Tobacco Treatment. 2015; Available at: http://www.jointcommission.org/tobacco_treatment/. Accessed February, 19, 2019.
13. Kazemzadeh Z, Manzari ZS, Pouresmail Z. Nursing interventions for smoking cessation in hospitalized patients: a systematic review. Int Nurs Rev. 2017;64(2):263-275.
14. Padberg RM, Padberg LF. Strengthening the effectiveness of patient education: applying principles of adult education. Oncol Nurs Forum. 1990;17(1):65.
15. Porter A. The role of the advanced practice nurse in promoting smoking cessation in the adult population. Medsurg Nursing. 2013;22(4):264.
16. Perloff J, DesRoches CM, Buerhaus P. Comparing the cost of care provided to medicare beneficiaries assigned to primary care nurse practitioners and physicians. Health Serv Res. 2016;51(4):1407-1423.
17. Shelley D, Goldfeld KS, Park H, Mola A, Sullivan R, Austrian J. System changes to implement the Joint Commission Tobacco Treatment (TOB) Performance Measures for improving the treatment of tobacco use among hospitalized patients. Jt Comm J Qual Saf. 2017;43(5):234-240.
18. Rice VH, Stead L. Nursing intervention and smoking cessation: meta-analysis update. Heart Lung. 2006 May-Jun;35(3):147-163.
19. Cooley ME, Lundin R, Murray L. Smoking cessation interventions in cancer care: opportunities for oncology nurses and nurse scientists. Annu Rev Nurs Res. 2009 06;27:243-272.
20. McCarter K, Martinez U, Britton B, Baker A, Bonevski B, Carter G, et al. Smoking cessation care among patients with head and neck cancer: a systematic review. BMJ Open. 2016 Sep 20;6(9):e012296-2016-012296.
21. Nayan S, Gupta MK, Strychowsky JE, Sommer DD. Smoking cessation interventions and cessation rates in the oncology population: An updated systematic review and meta-analysis. Otolaryngol Head Neck Surg. 2013;149(2):200-211.

22. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS medicine. 2009;6(7):e1000097.
23. Albarran JW. Response to editorial on nurse led care. BMJ. 2005;330:682-683.
24. Garrard J. Health sciences literature review made easy: the matrix method. 5th ed. Sudbury, MS: Jones & Barrlett Learning; 2017.
25. Hughes JR, Keely JP, Niaura RS, Ossip-Klein DJ, Richmond RL, Swan GE. Measures of abstinence in clinical trials: issues and recommendations. Nicotine Tob Res. 2003;5(1):13.
26. Cheung KL, de Ruijter D, Hiligsmann M, Elfeddali I, Hoving C, Evers SMAA, et al. Exploring consensus on how to measure smoking cessation. A Delphi study. BMC Public Health. 2017;17(1):890-10.
27. Fiore MC, Bailey WC, Cohen SJ, Dorfman SF, Goldstein MG, Gritz ER, et al. Treating tobacco use and dependence. Clinical practice guideline. Rockville, MD: US Department of Health and Human Services; 2000.
28. Cooper MH. Research synthesis and meta-analysis: a step by step approach. 5th ed. Thousand Oaks, CA: Sage; 2017.
29. Armijo-Olivo S, Stiles CR, Hagen NA, Biondo PD, Cummings GG. Assessment of study quality for systematic reviews: a comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: methodological research. J Eval Clin Pract. 2012;18(1):12-18.
30. Wewers ME, Bowen JM, Stanislaw AE, Desimone VB. A nurse-delivered smoking cessation intervention among hospitalized postoperative patients--influence of a smoking-related diagnosis: a pilot study. Heart Lung. 1994 Mar-Apr;23(2):151-156.
31. Stanislaw AE, Wewers ME. A smoking cessation intervention with hospitalized surgical cancer patients: a pilot study. Cancer Nurs. 1994 1994;17(2):81-86.
32. Griebel B, Wewers ME, Baker CA. The effectiveness of a nurse-managed minimal smoking-cessation intervention among hospitalized patients with cancer. Oncol Nurs Forum. 1998;25(5):897-902.
33. Li WHC, Wang MP, Ho KY, Lam KKW, Cheung DYT, Cheung YTY, et al. Helping cancer patients quit smoking using brief advice based on risk communication: a randomized controlled trial. Sci Rep. 2018 Feb 9;8(1):2712-018-21207-1.
34. Ostroff JS, Burkhalter JE, Cinciripini PM, Li Y, Shiyko MP, Lam CY, et al. Randomized trial of a presurgical scheduled reduced smoking intervention for patients newly diagnosed with cancer. Health Psychology. 2014 07;33(7):737-747.
35. Duffy SA, Ronis DL, Valenstein M, Lambert MT, Fowler KE, Gregory L, et al. A tailored smoking, alcohol, and depression intervention for head and neck cancer patients. Cancer Epidemiol Biomarkers Prev. 2006 Nov;15(11):2203-2208.
36. Gosselin M, Mahoney MC, Cummings KM, Loree TR, Sullivan M, King BA, et al. Evaluation of an intervention to enhance the delivery of smoking cessation services to patients with cancer. J Cancer Educ. 2011;26(3):577-582.
37. Browning KK, Ahijevych KL, Ross P,Jr, Wewers ME. Implementing the Agency for Health Care Policy and Research's smoking cessation guideline in a lung cancer surgery clinic. Oncol Nurs Forum. 2000 09;27(8):1248-1254.
38. Wewers ME, Jenkins L, Mignery T. A nurse-managed smoking cessation intervention during diagnostic testing for lung cancer. Oncol Nurs Forum. 1997;24(8):1419-1422.
39. McDonnell KK, Bullock LF, Kozower BD, Hollen PJ, Heath J, Rovnyak V. A decision aid to improve smoking abstinence for families facing cancer. Oncol Nurs Forum. 2014 Nov 1;41(6):649-658.
40. Sharp L, Johansson H, Fagerstrom K, Rutqvist L. Smoking cessation among patients with head and neck cancer: cancer as a 'teachable moment'. Eur J Cancer Care. 2008 03;17(2):114-119.
41. de Bruin-Visser JC, Ackerstaff AH, Rehorst H, Retel VP, Hilgers FJ. Integration of a smoking cessation program in the treatment protocol for patients with head and neck and lung cancer. Eur Arch Otorhinolaryngol. 2012 Feb;269(2):659-665.

42. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2008 update. Clinical practice guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service; 2008.
43. Moller AM, Pedersen T, Villebro N, Schnaberich A, Haas M, Tonnesen R. A study of the impact of long-term tobacco smoking on postoperative intensive care admission. Anaesthesia. 2003;58(1):55-59.
44. Gajdos C, Hawn MT, Campagna EJ, Henderson WG, Singh JA, Houston T. Adverse effects of smoking on postoperative outcomes in cancer patients. Ann Surg Oncol. 2012;19(5):1430-1438.
45. Aveyard P, Begh R, Parsons A, West R. Brief opportunistic smoking cessation interventions: a systematic review and meta-analysis to compare advice to quit and offer of assistance. Addiction. 2012;107(6):1066-1073.
46. The Tobacco Use and Dependence Clinical Practice Guideline Panel, Staff, and Consortium Representatives. A clinical practice guideline for treating tobacco use and dependence: a US Public Health Service report. JAMA. 2000;283(24):3244-3254.
47. Fiore MC, Wetter DW, Bailey WC, Bennett G, Cohen SJ, Dorfman SF, et al. The Agency for Health Care Policy and Research Smoking Cessation Clinical Practice Guideline. JAMA. 1996;275(16):1270-1280.
48. Sarna L, Bialous SA. Implementation of tobacco dependence treatment programs in oncology settings. Seminars in Oncology Nursing. 2016 Aug;32(3):187-196.
49. Rigotti NA, Clair C, Munafò MR, Stead LF. Interventions for smoking cessation in hospitalised patients. The Cochrane database of systematic reviews. 2012(5):CD001837.
50. Cooley ME, Sarna L, Brown JK, Williams RD, Chernecky C, Padilla G, et al. Tobacco use in women with lung cancer. Ann Behav Med. 2007 Jun;33(3):242-250.
51. SRNT Subcommittee on Biochemical Verification. Biochemical verification of tobacco use and cessation. Nicotine Tob Res. 2002;4(2):149.

ผลของโปรแกรมการเลิกสูบบุหรี่โดยพยาบาลในผู้ป่วยโรคมะเร็ง:การทบทวนวรรณกรรมอย่างเป็นระบบ

เชิดศักดิ์ ดวงจันทร์ Alicia K. Matthews*

บทคัดย่อ: การสูบบุหรี่ในผู้ป่วยโรคมะเร็งมีความสัมพันธ์ต่อความรุนแรงของโรคและอัตราตายที่เพิ่มสูงขึ้น พยาบาลมีบทบาทสำคัญด้านการส่งเสริมพฤติกรรมการสร้างเสริมสุขภาพของผู้ป่วย อย่างไรก็ตาม ยังไม่มีแนวปฏิบัติที่เป็นเลิศเพื่อการเลิกสูบบุหรี่สำหรับผู้ป่วยโรคมะเร็ง การทบทวนวรรณกรรมอย่างเป็นระบบครั้งนี้มีวัตถุประสงค์เพื่อศึกษาถึงผลของโปรแกรมการเลิกสูบบุหรี่โดยพยาบาลในผู้ป่วยโรคมะเร็ง เรียบเรียงขึ้นตามแบบรายงาน Preferred Reporting Items for Systematic Reviews and Meta-Analyses สืบค้นงานวิจัยจากฐานข้อมูลอิเล็กทรอนิกส์ ได้แก่ CINAHL plus with full text, PubMed, Scopus, Embase และ PsycINFO ครอบคลุมภาษาอังกฤษ ไม่จำกัดระยะเวลาการตีพิมพ์ ซึ่งงานนิพนธ์ต้นฉบับที่เป็นงานวิจัยเชิงทดลอง ศึกษาเกี่ยวกับโปรแกรมการเลิกสูบบุหรี่โดยพยาบาล และรายงานผลอัตราการเลิกสูบบุหรี่ ได้ถูกรวบรวม คัดเลือกและสกัดข้อมูลอย่างเป็นระบบ ประเมินคุณภาพงานวิจัยโดยใช้ Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies งานวิจัยที่ถูกคัดเลือกประกอบไปด้วยงานวิจัยเชิงทดลอง 6 ฉบับ และกึ่งทดลอง 6 ฉบับ คุณภาพของงานวิจัยมีความหลากหลาย โปรแกรมการเลิกสูบบุหรี่ส่วนใหญ่จะเป็นการให้คำปรึกษาแบบสั้นโดยพยาบาลในโรงพยาบาล นอกจากนี้ยังพบว่า มีการใช้นิโคตินทดแทนร่วมด้วยใน 5 งานวิจัย และยืนยันอัตราการเลิกสูบบุหรี่ด้วยวิธีทางชีวเคมีใน 9 งานวิจัย อัตราการเลิกสูบบุหรี่โดยรวมของกลุ่มทดลองคือ 43.4% และกลุ่มควบคุมคือ 27.1% โปรแกรมการเลิกสูบบุหรี่แบบเข้มข้นที่ประกอบไปด้วยการให้คำปรึกษา สื่อการสอน และการติดตามต่อเนื่องมีผลต่ออัตราการเลิกสูบบุหรี่ที่สูงสุด ผลการวิจัยแสดงให้เห็นถึงแนวโน้มที่ดีของโปรแกรมการเลิกสูบบุหรี่โดยพยาบาล อย่างไรก็ตาม งานวิจัยเกี่ยวกับโปรแกรมการเลิกสูบบุหรี่โดยพยาบาลในอนาคตควรได้รับการออกแบบให้มีคุณภาพที่สูงขึ้น

Pacific Rim Int J Nurs Res 2020; 24(1) 118-139

คำสำคัญ: ผู้รอดชีวิตจากมะเร็ง โปรแกรม การพยาบาล การเลิกสูบบุหรี่ การทบทวนวรรณกรรมอย่างเป็นระบบ บุหรี่

ติดต่อที่: เชิดศักดิ์ ดวงจันทร์*, RN, MSN, Doctoral student, Department of Health System Sciences, University of Illinois at Chicago College of Nursing, Chicago, Illinois, USA. E-mail:* cduang2@uic.edu

Alicia K. Matthews*, PhD, Professor, Department of Health System Sciences, University of Illinois at Chicago College of Nursing, Chicago, Illinois, USA. E-mail: aliciak@uic.edu*