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May, 2011

Men's Smoking Cessation Interventions: A Brief Review

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Available at: http://works.bepress.com/chizimuzo_okoli/22/

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Keywords

Men's health
Smoking cessation
Review
Sex differences
Gender differences

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Online 6 May 2011

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Abstract

Background: : Smoking is associated with adverse health effects and significant disease burden among men, making it an important men's health issue. Conversely, smoking cessation is associated with significant reductions in smoking-attributable risk. However, few studies have examined men-specific smoking cessation programs. The aim of our study was to conduct a comprehensive review of the literature to identify men-specific smoking cessation programs to make recommendations about future efforts to develop, implement and evaluate men-centered smoking cessation interventions.

Methods: : A comprehensive search of the COCHRANE Library, MEDLINE, and PsycINFO and SIGLE databases was performed. Out of 873 studies that we retrieved from the data base search, 11 publications met our inclusion criteria.

Results: : Of the 11 studies in our review, 7 employed a randomized controlled trial (RCT) design, 3 employed a cohort design, and 1 article employed a two-group pretest–posttest design. Only two studies had treatments that were tailored specifically for men. Overall, the majority of RCTs (6/7) provided significant treatment effects in favor of the intervention group.

Conclusions: : The few descriptive studies that have examined smoking cessation outcomes in men-only programs support calls for men-centered interventions. However, the factors underpinning men's smoking and cessation require further research attention. Future studies are needed that examine, incorporate, and evaluate sex-and gender-specific factors related to smoking cessation outcomes among men. Such studies will improve men's health by enhancing our understanding of their smoking behaviors. Moreover, the findings derived from such studies will be useful in guiding the development of tailored approaches to men's smoking cessation. © 2011 WPMH GmbH. Published by Elsevier Ireland Ltd.

Introduction

Smoking remains the single most preventable cause of mortality, and rates among men indicate that at least 35% of men in Western countries and 50% in developing countries continue to smoke [1]. Smoking is associated with several significant adverse health effects among men including cardiovascular disease [2] and cancer [3]. Indeed, the excess years of life lost for Western men versus women are most often attributed to cardiovascular disease [4], for which the high prevalence of smoking among men is a strong risk factor. Within the growing focus on gender and health, the influence of masculinities on men's health practices has attracted

recent attention [5]. In particular, understanding how men's roles, identities, and relations influence their smoking behaviors is key to effectively messaging men about health and for individualizing smoking cessation (SC) interventions. Although some sex- and gender-specific approaches to examining smoking have emerged [6–8], the focus has most often been on women while smoking among men is poorly understood.

The approaches most often described are related to sex differences, whereby *biologically* based constructs referring to an individual's anatomy, physiology, genes, and hormones are used to signal how smoking in males and females might differ. For example, studies have

shown that, compared to females, males are more sensitive to the reinforcing effects of nicotine, derive greater benefit from nicotine replacement therapy (NRT) during quitting, and are less sensitive to the non-nicotinic effects of cigarettes [9]. Supporting these assertions, a SC study found that men had higher nicotine dependence scores, but lower behavioral smoking scores than women [10].

Less attention has been paid to gender influences on men's smoking. Gender refers to *socially* prescribed and experienced dimensions of life. There is evidence that gender norms influence men's smoking behaviors. For example, men's propensity for tobacco and other substance use has been interpreted to represent men's alignment with masculine ideals that signify strength and invulnerability to illness and disease [11]. Masculine images (e.g., the Marlboro Man) have been used by tobacco companies to market cigarettes, indicating the importance of gender influences in attracting young men to smoking [12,13]. Moreover, other studies have found differences in patterns and motives for smoking that suggest gender influences related to the use of cigarettes in social interactions. For example, using the "Modified Reasons for Smoking Scale," a study found that men's scores were lower than women's scores on "tension reduction/relaxation", "stimulation" and "social smoking"[14]. In addition, a lower average number of cigarettes smoked per day (cigs/day) was predicted by higher "social smoking" scores in men, but higher depression scores in women. Negative affect was positively associated with "addictive smoking" and "social smoking" in men, but with "habit/automatism" in women [14].

Given emerging evidence relating to sex and gender influences on men's smoking, we conducted a comprehensive literature review to examine what has been offered to men as a means for making recommendations about future efforts to develop, implement and evaluate men-centered SC interventions.

Methods

A comprehensive search of the COCHRANE Library, Medical Literature Analysis and Retrieval System Online (MEDLINE), PsychINFO and System for Information on Grey Literature in

Europe (SIGLE) databases was performed using the following combinations of keywords: men; male; boys; gay; trans-gendered; gender or sex AND smoking; tobacco; nicotine or cigarette AND cessation; quit; reduction; abstinence or control AND therapy; treatment; intervention; program or counseling AND cognitive behavioral; pharmacotherapy or brief intervention AND bupropion/Wellbutrin/Zyban; nicotine replacement; varenicline/champix/chantix; nortriptyline; or naltrexone.

The search was limited to English language articles published before May 2009 that examined interventions specifically addressing SC or reduction among men. References from the retrieved articles were also examined for potentially relevant articles. Empirical studies were selected if they employed a quantitative research methodology and had clearly defined intervention components and SC outcomes (by biochemical validation and/or self-reports). The participants of the experimental intervention had to be men only. We excluded studies which aimed at reducing multiple risk behaviors concurrently (e.g., smoking and unhealthy diet). After removing duplicates, a total of 873 studies were obtained from our search of databases. After assessing titles and abstracts of the retrieved articles and relevant references of retrieved articles, 11 publications met the aforementioned inclusion criteria.

Results

Characteristics of included studies

The general characteristics of the reviewed studies are provided in Table 1. The reviewed studies were performed in five countries, with five articles (45%) from the United States of America (USA), two articles (18%) from the United Kingdom (UK), two articles (18%) from Australia, one study from China (9%), and one study from Finland (9%); representing a total of 6724 men. Individuals delivering the interventions included physicians, social workers, volunteers, and clinicians; and interventions were delivered in diverse settings (including a prison clinic, a residential treatment centre, a home, and a community-based volunteer charity). Three studies were carried out in a population of veterans with a history of substance use disorders and/or psychiatric illness [15–17],

Table 1 Description of studies

[Reference no.] author (year); country	Mean age	Population	Provider	Intervention setting	Smoking history (mean cigs/day)
[19] Rose & Hamilton (1978); UK	52.9	At risk for cardiovascular disease	Physicians	Clinic	19.0
[22] Li et al. (1984); USA	43.4	Asbestos workers	Physicians	Shipyard clinic	24.9
[15] Burling et al. (1991); USA	32.2	Substance users	Para professionals (social workers)	Residential treatment centre	19.0
[18] Pallonen et al. (1994); Finland	51.8	At risk for cardiovascular disease	None	Home	18.9
[24] Jenkins et al. (1997); USA	38.5	Vietnamese Americans	N/A	Media intervention	12.2
[17] Kalman et al. (2001); USA	NR	Substance users	Clinicians	Treatment centre	NR
[20] Stanton et al. (2004); Australia	Age range 16–56 years	Blue collar workers	General practitioner	Home/clinic	NR
[23] Harding et al. (2005); UK	37.1	Gay men	Volunteers	Community based volunteer charity	39% smoked 11–20 cigs/day
[21] Loke & Lam (2005); China	No information on husband's age. For women, mean age not stated; mode is 26–30 years.	Smoking husbands of never-smoking pregnant women	Obstetricians	Women and children health care centre	Mean not stated. Mode: 6–15 cigs/day
[25] Richmond et al. (2006); Australia	35	Prison inmates	Physician	Prison clinic	11–20
[16] Gershon Grand et al. (2007); USA	49.1	Substance users/mental illness	Clinic physicians	Clinic	17.6

cigs/day, cigarettes per day; NR, not reported; N/A, not applicable.

there were two studies each among men at risk for cardiovascular disease [18,19] and expectant fathers [20,21], and one study each among asbestos exposed workers [22], gay men [23], Vietnamese American men [24], and prison inmates [25]. The mean age of men represented by the studies varied from 32.2 to 52.9 years, and the average cigs/day ranged from 12.2 to 24.9.

The study design and intervention components are described in Table 2. Seven studies employed a randomized control trial (RCT) design, three studies employed a cohort design (i.e., single group pre-post test design), and one article employed a two-group pre-post test design. Among the RCTs, intervention components included advice on SC from physicians, the use of SC pamphlets with behavioral

counseling, contingency contract, self-help manuals designed for stages of change, and individual behavioral counseling with pharmacotherapy. The three studies that employed a cohort design used a behavioral intervention with pharmacotherapy, whereas the study employing a two-community pretest-posttest design used a media-led intervention.

Male-specific intervention components

In two studies treatments that were tailored for men were investigated [20,23]. The SC program for gay men included NRT, group treatment, and peer support. In addition to SC strategies, sexuality, drug use, and HIV issues were addressed. Based on the experiences with other group interventions delivered in this population, peer support occurred in groups

Table 2 Study design, intervention components and sample size

[Reference no.] author (year)	Study design	Intervention components	Intensity of intervention	Sample size
[19] Rose & Hamilton (1978)	RCT	Intervention group: advice to quit smoking from physicians. Control group: no intervention.	3 sessions (15 minutes)	<i>N</i> = 1445 Intervention: 714 Control: 731
[22] Li et al. (1984)	RCT	Intervention group: smoking cessation pamphlet and behavioral counseling. Control group: smoking cessation pamphlet.	One session of 3–5 minutes	<i>N</i> = 576 Intervention: 215 Control: 361
[15] Burling et al. (1991)	RCT	Intervention group: computerized nicotine fading, relapse prevention, contingency contract. Control group: no smoking cessation treatment.	3–4 week program (daily meeting with counsellors for 10 days)	<i>N</i> = 39 Intervention: 19 Control: 20
[18] Pallonen et al. (1994)	RCT	Intervention group: self help manuals designed for stages of change. Control group: no self-help manuals.	Manuals mailed every 6 months based on change in stages of change	<i>N</i> = 265 Intervention: 149 Control: 116
[24] Jenkins et al. (1997)	Two communities pre–post test with randomly selected participants	Intervention community: media-led anti-tobacco interventions (including videos, billboards, paid television ads, and newspaper ads). Control community: not exposed to intervention.	2 years	<i>N</i> = 2714 Intervention: 1133 Control: 1581
[17] Kalman et al. (2001)	RCT	Intervention group: individual smoking cessation counseling, 8 weeks of nicotine patch (22 mg for 2 weeks and 11 mg for 6 weeks) plus concurrent smoking cessation and substance use treatment. Control group: individual smoking cessation counseling, 8 weeks of nicotine patch (22 mg for 2 weeks and 11 mg for 6 weeks) plus delayed smoking cessation and substance use treatment.	8 weeks of treatment with 3 sessions (45 minutes) of behavioral counseling.	<i>N</i> = 36 Intervention: 18 Control: 18
[20] Stanton et al. (2004)	RCT (stratified by smoking status of female partner)	Intervention group: video, nicotine patch with telephone interview from GP, and support material. Control group: brochure with information about smoking cessation options	4–5 telephone contacts and 3 mailing contacts	<i>N</i> = 561 Intervention: 291 Control: 270
[23] Harding et al. (2005)	Cohort	Intervention: group behavioral counseling and nicotine replacement therapy and peer support.	7 weeks with 2 hours of counseling per weekly session	<i>N</i> = 69
[21] Loke & Lam (2005)	RCT	Intervention group: brief education for women on second-hand-smoke exposure, advice on encouraging their husbands to give up smoking, an educational/self-help booklet, and reminders during subsequent visits. Control group: no intervention	1 initial session of 2–3 minutes, additional reminders 1.5 minutes each	<i>N</i> = 758 women Intervention: 380 Control: 378

Table 2 (Continued)

[Reference no.] author (year)	Study design	Intervention components	Intensity of intervention	Sample size
[25] Richmond et al (2006)	Cohort	Intervention: brief behavioral counseling plus nicotine replacement therapy and bupropion.	10 week program with 2 sessions of behavioral counseling	N = 30
[16] Gershon Grand et al. (2007)	Cohort	Intervention: group behavioral counseling plus nicotine replacement therapy and bupropion.	6–12 week program with a 45 minute counseling session per week	N = 231

of 3–4 participants [23]. In an Australian study, which targeted expectant fathers, the intervention included a video which was introduced by a national football player, and focused on becoming a father and on the health risks of second hand smoke (SHS) exposure for the newborn [20]. In contrast, another study targeting expectant fathers employed an indirect intervention which did not include men-specific content. The expectant fathers' wives received education on SHS exposure, an educational booklet, and advice to urge their husbands to stop smoking [21]. In a fourth study, which targeted male prisoners, the counseling sessions were reported to be tailored specifically for inmates and based upon previous focus group discussion [25]. In the remaining studies, the counseling components consisted of non-sex and gender-specific strategies including behavioral cessation, coping, and relapse prevention strategies [15–17], disease-related information [19,22], intervention strategies based on the participant's readiness to quit [18], and a multicomponent multimedia community campaign [24].

Efficacy of smoking cessation and reduction interventions

Table 3 provides the SC outcomes of the studies. A majority of studies (7/11) utilized self-reported SC with biochemical validation (i.e., expired CO) as the main outcome measure; however, only 5 studies (45%) reported on smoking reduction outcomes. The assessment of final SC outcomes varied considerably between studies, with two studies assessing SC only at end-of-treatment, three studies at 6-months after intervention, and the remaining studies anywhere from 3-months to 3-years

post intervention. The differences in treatment outcome measurement and heterogeneity in treatment components preclude a meta-analytic assessment.

Smoking cessation outcomes

End-of-treatment SC outcomes for the three cohort studies were 22% [25], 36.4% [16], and 64% [23]. Furthermore, among RCT studies, the majority (i.e., 6/7) showed significant treatment effects in favor of the intervention. Finally, the study employing a two-communities pre-post test design [24] also demonstrated significant intervention effectiveness.

Smoking reduction outcomes

Of the five studies that assessed smoking reduction, only two studies reported significant findings. One study [25] examined a cohort of prison inmates who volunteered for a 10 week SC program. Of the three-quarters who had relapsed by 6 months, there was a median reduction in cigarettes from 45 g at baseline to 30 g. Furthermore, another study [21] reported that 39.7% of participants in the experimental condition reduced their cigs/day compared to 17.7% in the control condition; while 9.5% of participants in the experimental condition increased their smoking compared to 11.6% in the control condition.

Efficacy and effectiveness of treatments based on modality and intensity

In the three cohort studies [16,23,25] researchers used multi-component interventions that combined behavioral counseling with pharmacotherapy (i.e., bupropion and/or NRT). The average duration of the programs was 6–12

Table 3 Smoking cessation outcomes

[Reference no.] author (year)	Outcome measure	Time points of interest	Smoking cessation outcome (intervention vs. control group, unless otherwise specified)**	Smoking reduction outcome (intervention vs. control group, unless otherwise specified) Mean cigs/day
[19] Rose & Hamilton (1978)	Self-report	1 year	1 year: 227/714 (31.8%) vs. 56/731 (7.6%)*	One year: 4.8 vs. 16.6
		3 years	3 years: 162/714 (22.7%) vs. 74/731 (10.1%)*	Three year: 6.2 vs. 15.7
[22] Li et al. (1984)	Self-report plus expired CO	11 months	11 months: 18/215 (8.45) vs. 13/361 (3.6%)*	NR
[15] Burling et al. (1991)	Self-report plus expired CO	3-months	10 weeks: 5/19 (26.3) vs. 0/20 (0.0%)*	10 weeks: 20.5 vs. 17.9
		6-months	3-months: 0/19 (0%) vs. 0/20 (0%) 6-months: 0/19 (0%) vs. 0/20 (0%)	3-month: 21.4 vs. 16.1 6-month: 20.8 vs. 16.5
[18] Pallonen et al. (1994)	7-day point prevalence based on self-report	12-months 24-months	Contemplators: 12-months: 25% vs. 13.2%* 24-months: 28.9% vs. 22.6%* Pre-contemplators: 24-months: 7.6% vs. 6.4%	NR
[24] Jenkins et al. (1997)	Self reported quitting	Any time during 2 year period	Pretest vs. posttest intervention group: 7.2 vs. 10.2* Control group: 5.8 vs. 7.4 (ns)	NR
[17] Kalman et al. (2001)	7-day point prevalence based on expired CO	20 weeks (5 months)	20 weeks: 16.6% vs. 6%	20 weeks: 13.2 vs. 14.8
[20] Stanton et al. (2004)	Self report plus expired CO	End of pregnancy (6-months after treatment began)	6 months: 48/291 (16.5%) vs. 25/270 (9.3%)*	NR
[23] Harding et al. (2005)	Self-report plus expired CO	End of treatment (7 weeks)	7 weeks: 44/69 (64%)	NR
[21] Loke & Lam (2005)	Self-report of the men's wives	1 month before expected delivery date (3–5 months after intervention)	7-day-PPA: 8.4% versus 4.8%* 30-day-PPA: 6.1% versus 4.2% (n.s.)	39.7% vs. 17.7% of husbands reduced smoking; 9.5% vs. 11.6% increased smoking*
[25] Richmond et al. (2006)	7-day point-prevalence plus expired CO continuous abstinence	5 month follow up and 6 month follow up	7-day point prevalence: 5-months: 37% 6-months: 26% Continuous abstinence 5-months: 26% 6-months: 22%	For the three-quarters who had relapsed by 6-months, reduction in cigarettes was 30 g (6-month) vs. 45 g (baseline)*

Table 3 (Continued)

[Reference no.] author (year)	Outcome measure	Time points of interest	Smoking cessation outcome (intervention vs. control group, unless otherwise specified)**	Smoking reduction outcome (intervention vs. control group, unless otherwise specified) Mean cigs/day
[16] Gershon Grand et al. (2007)	7-day point- prevalence plus expired CO	End of treatment (12 weeks)	12 weeks: 84/231 (36.4%)	NR

* Significant differences between groups.
** Only biochemically validated responses are reported when biochemical validation (i.e., cotinine, or expired CO) was used as an outcome measure.
ns, non-significant; NR, not recorded; CO, carbon monoxide.

weeks but each differed in length of counseling sessions (i.e., 45 min to 2 h). Overall, the use of behavioral counseling with pharmacotherapy was associated with high end-of-treatment SC outcomes.

Among the seven RCTs, two used single-component interventions. One study [19] compared the advice to quit smoking (three 15 min sessions) from physicians against no intervention among males at high risk for cardiovascular disease. They found significant increases in smoking abstinence at 1- and 3-years post-intervention between those in the intervention and control groups. In a similar fashion, another study [18] found significant increases in abstinence at 12- and 24-months among males randomized to a stage-based self-help manual as compared to those receiving no self-help manuals. With regards to the five studies employing multi-component interventions, two studies employed the use of behavioral counseling and SC pamphlets [22] and relapse prevention in conjunction with a contingency contract [15]. These studies both found significant increases in end-of-treatment abstinence in the intervention relative to the control group. Moreover, a further two studies employed behavioral counseling in conjunction with pharmacotherapy. The first study [20] examined the efficacy of a SC program that included video exposure, telephone interview with a general practitioner, support material, and NRT patch. The intervention resulted in a significant difference in SC between the intervention and control group (16.5% vs. 9.3%). However, in the second study [17] in which males in alcohol abuse treatment were

randomized to receive either a sequential or concurrent treatment of behavioral counseling and pharmacotherapy for 8 weeks, there was no difference between the intervention and control group in treatment efficacy. The low end-of-treatment smoking abstinence rates (intervention=3% vs. control=1%) may be a reflection of the co-occurrence of alcohol dependence in that population. A final study [21] reported that males who received an indirect intervention delivered through their wives had significantly higher 7-day point-prevalence abstinence rates (8.4% vs. 4.8%) at the follow-up time-point compared to those who received no intervention.

Discussion

Although previous studies have reported sex differences between men and women in SC outcomes [26], discrete sex and gender patterns within male cohorts and the effects of masculinity on men’s SC are poorly understood. No intervention in our review explicitly considered sex (e.g., differences in SC between men with high and low testosterone levels) or gender (e.g., differences in SC between fathers and non-fathers) as a factor for contextualizing the men’s SC. Overall the findings of our current study indicate that several men’s SC interventions have shown moderate efficacy and effectiveness, particularly with the use of a combination of behavioral counseling and pharmacotherapy. This finding is congruent with evidence-based recommendations for the treatment of smoking [27].

Although these SC programs targeted men, it did not appear that sex or gender influences on men's smoking and cessation were key factors influencing the design or delivery of SC programs. In most studies, the development and/or delivery of the intervention was informed by theoretical considerations referring to the transtheoretical model, or learning theories that underlay cognitive-behavioral and relapse prevention components. Moreover, only two trials included treatment components which were specifically tailored to gay men [23] and expectant fathers [21], respectively, thus were identified as being men-centered. The remaining interventions were implemented in settings that served men, such as Veteran Affairs Centers and prisons for men, or just defined their target group as men.

Surprisingly, we identified only 11 intervention studies detailing men-specific SC programs. In contrast, in a recent systematic review on sex and gender-based smoking cessation programs, 44 studies targeting women were included [28]. This difference in availability of gender-specific intervention studies may mirror repeated observations that women achieve lower abstinence rates after participating in/completing mixed-gender SC interventions as compared to men [26,28–30]. As such, it has been suggested that women may benefit from tobacco dependence treatments that address their specific biological and psychosocial needs [31,32]. Hence, a suite of women-centered treatment models have been developed and tested to address the specific needs of women [28].

An argument can and should be made for developing men-centered SC programs. As men's smoking behaviors are consistently linked to the pharmacological effects of nicotine [33] it can be reasonably argued that men-specific SC interventions, as they currently stand, are synonymous with pharmacotherapy. In fact, all but one [21] of the studies published since 2000 included medication. However, focusing on pharmacotherapy alone may prevent the recognition of other sex- and gender-specific factors related to men's SC. For example, recent qualitative research on men's smoking in the context of their partner's pregnancy suggests that an understanding of gendered aspects of men's smoking is key for developing effective SC interventions that are tailored to men's lives [34].

Future studies might include direct examination of sex- and gendered-effects on SC outcomes. For example, measures such as the Bem Sex Role Inventory [35] and Conformity to Masculine Norms Index [36], which measure how closely individuals align with gender stereotypes and masculine ideals, may reveal associations and patterns to guide SC treatments and evaluate outcomes. In particular, based on previous research, it may be important to consider gendered elements that would enhance men's engagement in SC programs and accommodate their preferences (such as the need for autonomy)[34]. Moreover, it may be important to assess the effect of biological sex factors in SC outcomes among men. For example, low perceived stress has been identified as an important predictor of successful SC among men (but not among women) [37]. It may be important to assess whether there is a link between stress hormone levels and efficacy of SC intervention, with the potential addition of stress reduction/coping as a component of SC interventions among men.

In conclusion, the findings of our current review suggest the need for further sex- and gender-based analysis of SC outcomes, with a particular focus on how masculinity (as it intersects with culture, social class, and age) relates to SC among men. Although several SC interventions among men have yielded modest results, designing gender-sensitive SC programs will likely enhance their effectiveness. Sex- and gender-based analyses are required to advance the health of men and their families and guide future tobacco cessation research and policy, as well as tailored-interventions.

Acknowledgements

Dr Okoli was supported by a postdoctoral research fellowship from the Canadian Institute of Health Research (CIHR) Intersections of Mental Health Perspectives in Addictions Research Training (IMPART). Dr Torchalla was supported by a postdoctoral research fellowship through the CIHR Investigating Tobacco and Gender (iTAG) team grant. The CIHR had no further roles in study design; in the collection, analysis, and interpretation of the data; in the writing of the report; or in the decision to submit the paper for publication.

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