Addictive Behaviors 45 (2015) 79–86

Contents lists available at ScienceDirect

Addictive Behaviors

Cost-effectiveness analysis of smoking-cessation counseling training for physicians and pharmacists

Scott B. Cantor [a,*], Ashish A. Deshmukh [a], Nancy Stancic Luca [b], Graciela M. Nogueras-González [c], Tanya Rajan [a], Alexander V. Prokhorov [d]

[a] Department of Health Services Research, The University of Texas MD Anderson Cancer Center, Houston, TX, USA
[b] Office of Research, Texas Woman's University, Houston, TX, USA
[c] Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, TX, USA
[d] Department of Behavioral Science, The University of Texas MD Anderson Cancer Center, Houston, TX, USA

HIGHLIGHTS

- We performed an economic evaluation of smoking-cessation counseling training.
- We compared training physicians or pharmacists, training both, and training none.
- Outcomes were measured using cost per quit and cost per quality-adjusted life-year.
- Training both physicians and pharmacists could be cost-effective.
- The intervention was highly sensitive to the quit rates and community size.

ARTICLE INFO

Available online 14 January 2015

Keywords:
Medical decision making
Costs and cost analysis
Nicotine
Smoking cessation

ABSTRACT

Background: Although smoking-cessation interventions typically focus directly on patients, this paper conducts an economic evaluation of a novel smoking-cessation intervention focused on training physicians and/or pharmacists to use counseling techniques that would decrease smoking rates at a reasonable cost.
Purpose: To evaluate the cost-effectiveness of interventions that train physicians and/or pharmacists to counsel their patients on smoking-cessation techniques.
Methods: Using decision-analytic modeling, we compared four strategies for smoking-cessation counseling education: training only physicians, training only pharmacists, training both physicians and pharmacists (synergy strategy), and training neither physicians nor pharmacists (i.e., no specialized training, which is the usual practice). Short-term outcomes were based on results from a clinical trial conducted in 16 communities across the Houston area; long-term outcomes were calculated from epidemiological data. Short-term outcomes were measured using the cost per quit, and long-term outcomes were measured using the cost per quality-adjusted life-year (QALY). Cost data were taken from institutional sources; both costs and QALYs were discounted at 3%.
Results: Training both physicians and pharmacists added 0.09 QALY for 45-year-old men. However, for 45-year-old women, the discounted quality-adjusted life expectancy only increased by 0.01 QALY when comparing the synergy strategy to no intervention. The incremental cost-effectiveness ratio (ICER) of the synergy strategy with respect to the non-intervention strategy was US$868/QALY for 45-year-old men and US$8953/QALY for 45-year-old women. The results were highly sensitive to the quit rates and community size.
Conclusion: Synergistic educational training for physicians and pharmacists could be a cost-effective method for smoking cessation in the community.

Published by Elsevier Ltd.

1. Introduction

Many smoking-cessation interventions have been successful and cost-effective. Typically, interventions focus directly on an individual patient through the use of pharmaceutical agents (e.g., bupropion (Bolin, Lindgren, & Willers, 2006) or nortriptyline (Hall et al., 2005)), nicotine gum (Fagerstrom, 1982; Hjalmarson, 1984), and transdermal

* Corresponding author at: Department of Health Services Research, Unit 1444, The University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77030, USA. Tel.: +1 713 563 0020; fax: +1 713 563 0059.
E-mail address: sbcantor@mdanderson.org (S.B. Cantor).

http://dx.doi.org/10.1016/j.addbeh.2015.01.004
0306-4603/Published by Elsevier Ltd.

nicotine patch and nicotine nasal spray (Abelin, Buehler, Muller, Vesanen, & Imhof, 1989; Fiscella & Franks, 1996; Hurt et al., 1994), or indirectly through physician counseling (Cromwell, Bartosch, Fiore, Hasselblad, & Baker, 1997; Cummings, Rubin, & Oster, 1989). Research on these interventions has shown that they can have significant health benefits.

Physicians are best positioned to play a crucial role in smoking cessation and prevention efforts (Fiore et al., 2000), and of all health care providers, pharmacists are possibly the most accessible to the public. Research shows that if trained, both physicians and pharmacists could have significant roles in helping patients quit smoking (Kottke, Brekke, Solberg, & Hughes, 1989; Richmond, Mendelsohn, & Kehoe, 1998). However, only one study (Pinget, Martin, Wasserfallen, Humair, & Cornuz, 2007) showed that such specialized training could be cost-effective.

On the basis of these previous studies, we hypothesized that an indirect physician and pharmacist training smoking-cessation intervention may also be cost-effective. The proposed study evaluates the cost-effectiveness of an intervention that trains physicians and/or pharmacists to counsel their patients on smoking-cessation techniques.

2. Methods

2.1. Intervention

Researchers at The University of Texas MD Anderson Cancer Center developed The Health Care Team Approach to Smoking Cessation: Enhanced Tobacco Outreach Education Program (eTOEP), known as the TEAM Tobacco intervention (Prokhorov et al., 2010).

The intervention is a community-based health care provider continuing medical education (CME) training program designed to improve smoking-cessation counseling skills among physicians and pharmacists. The effectiveness of the eTOEP intervention was tested through a group-randomized trial with four treatment conditions—training both physicians and pharmacists (synergy condition), training neither physicians nor pharmacists (which is the usual practice), training only physicians, or training only pharmacists—in 16 communities around Houston, Texas.

2.2. Providers

Physicians and pharmacists (hereafter, providers) from the 16 communities were recruited to participate in the eTOEP. Each community was randomized into one of the four training strategies for smoking-cessation counseling. When smoking-cessation counseling training was not delivered (usual practice), an alternative duration of CME-accredited training on skin cancer prevention was delivered to counteract any potential bias or Hawthorne effect (McCarney et al., 2007; Trudeau, 1982).

In each community, several clinicians and pharmacists were recruited for a total of 170 providers. The overarching “physicians” category included family practitioners, nurse practitioners, obstetrician/gynecologists, pediatricians, and physician's assistants. Of 87 recruited physicians, 45 were trained for smoking-cessation counseling while 42 were trained about skin cancer prevention. Of 83 pharmacists, 45 were trained in smoking-cessation and 38 in skin-cancer prevention. The details of recruitment and retention of health care providers are presented elsewhere (Prokhorov et al., 2010).

2.3. Participants

Participants eligible for the study were at least 18 years old, English or Spanish speaking adult smokers who consented to complete the baseline and follow-up surveys (Prokhorov et al., 2010). The participants were surveyed four times by telephone or mail: at baseline and then 3, 6, and 12 months after entering the study. Each participant remained in the clinical trial for a 1-year period. A written informed consent was obtained from the participants during the initial contact.

Of the 888 eligible participants recruited, 240 were from a community where neither pharmacists nor physicians experienced tobacco-cessation training, 225 were from a community where only pharmacists received training, 177 were from a community where only physicians received training, and 246 were from a community where both pharmacists and physicians received training. The participants were compensated US$25 for a baseline assessment (at the time of recruitment) and for each subsequent assessment, for a total of US$100 at the end of the study.

The MD Anderson Cancer Center institutional review board approved the study protocol (BS01-129) on June 20, 2001. The study was conducted from February 2004 to May 2007.

2.4. Perspective for economic evaluation

A health care provider's perspective was adopted for this economic evaluation. This perspective necessitates inclusion of direct health care costs associated with the actual delivery of the program, and the economic evaluation was conducted to determine the cost-effectiveness of implementing the intervention (Honeycutt et al., 2006).

2.5. Decision-analytic model

The study constructed two decision-analytic models (Cantor, 1995) to reflect the economic costs and potential clinical benefits produced by the four smoking-cessation counseling education training strategies for the providers at two time points. Short-term outcomes (at 1 year) were evaluated in terms of cost per successful quit. Long-term outcome was modeled using the quit rates from the trial, life expectancy data for smokers and non-smokers, and other parameters from the literature, and were presented in terms of cost per quality-adjusted life-year [QALY]. According to the Health and Human Services Commission guidelines, a longer study period better reflects ongoing costs because costs stabilize over the year as more participants enroll and staffs are fully trained (Honeycutt et al., 2006). The guidelines also recommend a time frame long enough to cover the start-up and full implementation of the program (Honeycutt et al., 2006). Thus, this analysis uses self-reported quit rates 1 year from the baseline to determine clinical outcomes.

The economic analysis, however, incorporated a lifetime analytic horizon to capture the long-term benefits of smoking cessation. This is consistent with the guidelines for cost-effectiveness analysis established by the Panel for Cost-Effectiveness in Health and Medicine (Cantor & Miller, 2009; Lipscomb, Weinstein, & Torrance, 1996).

2.6. Model parameters

Probability data for the decision-analytic models were based on the medical literature and on data collected for this study. The 1-year quit rates from the study formed a baseline model that used costs and probabilities of quitting to estimate the cost per quit for each training strategy. The analysis uses self-reported quit rates to determine how many participants quit smoking. This is a common practice in similar community-based studies on smoking cessation interventions (Velicer, Prochaska, Rossi, & Snow, 1992; Zhu et al., 2002). The quit rates were assessed on the basis of response to the following two survey questions at the 12-month time-point since the participant's entry into the study:

1. How would you describe your smoking at this time, would you say that you have completely stopped smoking?
2. How would you describe your smoking at this time, would you say that you have not smoked at all since we last spoke?

Those who responded “yes” to one of the questions at the end of the one-year clinical trial period were considered quitters.