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Computerized scheduled gradual reduction for smokeless tobacco cessation: development and preliminary evaluation of a self-help program

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Abstract

This paper chronicles the development and feasibility testing of a computerized scheduled gradual reduction program for smokeless tobacco cessation. During Study 1, the LifeSign smoking cessation computer was adapted for use with smokeless tobacco by pairing it with an electronic timer. The computer recorded frequency of dips during a baseline phase and prompted for tobacco use during a gradual reduction phase. The timer was used to track the length of dips during baseline and to hold them to a fixed length during the reduction phase. Abstinence rates among 60 male daily smokeless tobacco users who received the program were 29% at 3-month follow-up (biochemically validated) and 19% at 12-month follow-up. Self-reported changes in topography of tobacco use were consistent with the scheduled reduction protocol. Study 2 evaluated a prototype computer that tracked both frequency and duration of dips during baseline and gradually reduced both parameters during the reduction phase. Among 19 subjects who received the program, self-reported abstinence rates were 56% at end of treatment and 11% at 12-month follow-up. Results of these two studies demonstrate the feasibility of computerized scheduled gradual reduction for smokeless tobacco cessation and provide a basis for further product development. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Smokeless tobacco; Addiction; Computer; Self-help; Smoking

1. Introduction

Use of smokeless tobacco is a growing public health concern. In the United States, more than 6% of adult men report using smokeless tobacco within the past month, and nearly 7.5 million Americans use smokeless tobacco daily (US Department of

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Health and Human Services, 1996). Concern over smokeless tobacco use stems from evidence that it is addictive and that long-term use is associated with a variety of diseases including cardiovascular disease, gum disease and oral cancer (see Hatsukami & Severson, 1999, for a review).

Despite the popularity of smokeless tobacco and clear evidence of health risks associated with use, only a relatively small number of treatment studies have been reported. Treatment approaches have included multicomponent behavioral interventions (Dilorenzo, Kern & Pieper, 1991) and self-help manuals adopted from smoking cessation programs (Boyle & Hatsukami, 1996; Severson, Akers, Andrews, Lichtenstein & Jerome, 2000); behavioral interventions conducted in dental office settings (Severson, Andrews, Lichtenstein, Gordon & Barley, 1998; Stevens, Severson, Lichtenstein, Little & Leben, 1995); and use of nicotine gum (Hatsukami, Jensen, Allen, Grillo & Bliss, 1996) and nicotine patches as treatment adjuncts (Howard-Pitney, Killen & Fortmann, 1999). After reviewing the available studies on smokeless tobacco cessation, Hatsukami and Severson (1999) concluded that among behavioral studies, abstinence rates at 3–6 months follow-up were typically in the 12–30% range; self-help studies and dental office interventions were promising avenues for further research; and available data do not support nicotine replacement as an effective treatment.

This paper chronicles the development of an innovative self-help intervention — LifeSign for Smokeless Tobacco³ (LS-ST) — that employs a small hand-held computer (HHC) to help tobacco users quit gradually. The first reported use of HHCs for behavioral intervention was a series of studies focusing on the treatment of obesity (Agras, Taylor, Feldman, Losch & Burnett, 1990; Burnett, Taylor & Agras, 1985). The program, referred to as CADET (computer-assisted diet and exercise treatment), adapted core components of behavioral interventions for weight loss (e.g. goal setting, self-monitoring, feedback) for implementation on an HHC. More recently, Newman and colleagues described the use of HHCs as treatment adjuncts for facilitating cognitive-behavioral therapy for anxiety disorders (Newman, Consoli & Taylor, 1999; Newman, Kenardy, Herman & Taylor, 1997). HHCs are well-suited for delivering interactive behavioral interventions in the user's environment. Treatment parameters can be adjusted dynamically in response to recorded behavior; feedback can be provided instantaneously; and self-monitored data can be stored, manipulated and displayed in numerous ways (Jerome & Frederiksen, 1992).

The first use of HHCs for tobacco cessation was our work with the LifeSign smoking cessation computer (Jerome, Perrone & Kalfus, 1992; Prue, Riley, Orlandi & Jerome, 1990). LifeSign for smoking cessation, as well as the current LS-ST program, uses a technique we refer to as computerized scheduled gradual reduction (CSGR). CSGR is an outgrowth of work on scheduled smoking (smoking on cue) that was explored in the early 1970s (see Cinciripini, Wetter & McClure, 1997, for a

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