Clinical Scholarship

Guided Health Imagery for Smoking Cessation and Long-Term Abstinence

Christine A. Wynd

Purpose: To examine the effectiveness of guided imagery for immediate smoking cessation and long-term abstinence in adult smokers.

Design: A repeated measures design was used with 71 smokers recruited from a hospital outpatient clinic, 38 in the intervention group, and 33 in the control group.

Methods: Both study groups received educational and counseling sessions in their homes. The intervention group was provided with additional instruction in the use of guided imagery and was encouraged to practice this imagery at least once per day with a 20-minute audiotaped exercise for reinforcement. The repeated measures included smoking rates (cigarettes per day) that were measured and confirmed through corroborating friends and family.

Findings: At 24-months after the intervention, smoking abstinence rates were significantly higher for the guided health imagery intervention group (26% abstinence rate versus 12% abstinence rate for the placebo-control group).

Conclusions: Guided imagery was an effective intervention for long-term smoking cessation and abstinence in adult smokers.

[Key words: smoking cessation, abstinence, guided health imagery]

Despite a steady decline in cigarette smoking in the United States (US), 22% of adults continue to smoke (Centers for Disease Control, 2005). A major priority for national health promotion activities is to reduce cigarette smoking prevalence to no more than 12% of all adults by the year 2010 (U.S. Department of Health and Human Services [USDHHS], 2000). Related health objectives include decreasing the number of deaths from coronary heart disease, lung cancer, and chronic obstructive pulmonary disease that are directly related to cigarette smoking.

The study described in this paper was designed to emphasize national health promotion efforts by investigating an intensive, home-visit-oriented, smoking behavior change intervention with adult smokers. The selected intervention was guided health imagery, based on past research (Wynd, 1991, 1992a, 1992b). This specific type of guided imagery, was designed to promote relaxation and behavior change through a visualization of health and its positive outcomes. The study was done to examine the effectiveness of guided health imagery as a nursing intervention for immediate smoking cessation and long-term abstinence.

Background

Guided imagery has been clinically investigated with successful results for symptom management in patients undergoing surgery (Cupal & Brewer, 2001; Dreher, 1998) and cancer chemotherapy (Kolcaba & Fox, 1999; Kwekkeboom, Kneip, & Pearson, 2003), as well as for reducing pain caused by burns (Patterson & Ptacek, 1997), headache (Mannix, Chandurkar, Rybicki, Tusek, & Solomon, 1999), rheumatoid arthritis (Jacobi & Eisenberg, 2002), and chronic pain (Lewandowski, 2004). Imagery was also used with women who experienced rape and other types of sexual assault to re-evaluate and restructure traumatic situations into new and more positive images. As a result, the frequency and number of nightmares were reduced for these women, sleep quality improved, and the severity of posttraumatic stress symptoms was decreased (Kraakow et al., 2001).

Short, Hall, Engel, and Nigg (2004) investigated the use of exercise imagery in 497 college students. Imagery was used to stimulate motivation to exercise, and the students imagined the actual exercise they wanted to accomplish. They also imagined improved physical appearance and

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better health resulting from exercise. The effectiveness of imagery was determined in self-revaluation of values with respect to sedentariness as a problem behavior. This approach to imagery was recommended for work with other risky behaviors such as smoking, poor dietary practices, and binge drinking.

Although many people have suggested imagery as a clinical application for smoking cessation, little empirical research has been reported. An early study was focused on aversive hypnotic therapy combined with positive imagery in the Straatmeyer dual phase model (1984). The aversive therapy included an image of a cigarette combined with a decomposing white mouse and positive imagery was based on age regression to help participants visualize their last 2 years as nonsmokers with an appearance and sensation of health, vitality, and pride. This intervention resulted in a 22% abstinence rate after 9 months.

Imagery has also been used to simulate smoking urges and cravings in a laboratory setting (Maude-Griffin & Tiffany, 1996; Tiffany & Drobles, 1990; Tiffany & Hakenwerth, 1991). The imagined urges produced physiological increases in heart rate, similar to increases produced by the nicotine itself, and affective mood states accompanied the urges with modulating emotional effects. Negative emotions, such as anger, stress, depression, tension, and anxiety increased the urge ratings, and positive responses, including relaxed mood, happy feelings, and peaceful sensations, resulted in lower urge ratings for smoking, thus establishing the mechanism of imagery as a source of urge and craving control.

Guided imagery interventions were used with 84 people recruited from the community and randomly assigned to one of two imagery groups (guided power imagery or relaxation imagery) or to a placebo-treatment control group (Wynd, 1990, 1991, 1992a). Smoking rates were measured repeatedly during six program sessions. Both imagery groups were equally effective in reducing smoking and, after the 3-month follow up, the power imagery group achieved a smoking abstinence rate of 52%, the relaxation group had a 55% abstinence rate, and the control group had a 27% abstinence rate.

In another study, guided imagery was used to reduce stress and prevent relapse in adult smokers (N=76) who completed a cessation program (Wynd, 1992b). Participants were randomly assigned to a relaxation imagery group (n=39) or to an “attention placebo” control group (n=37). Individual stress levels were measured with the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). At the conclusion of the 3-month relapse prevention program, 72% of the imagery group versus 51% of the control group remained abstinent.

These reported studies were the only known research to date to examine guided imagery as an intervention for smoking cessation and abstinence. Additional studies are indicated to evaluate well-defined imagery interventions with longer follow-up periods.

Theoretical Framework

Theoretical underpinnings for the current study were adapted from several theorists who have defined imagery as a highly focused form of concentration that creates an alteration of sensations, awareness, and perceptions with the same biopsychosocial, integrative properties that allow people to process sensory information (Ahlen, 1984, 2001; Hochman, 2003; Strosahl & Ascough, 1981). During the early sensory and perceptive phase of imagery, representations of reality, or images, are introduced (molecular imagery). At this stage, individual comprehension of the image is minimal; however, as people become more aware of the image, they enter into a “subjective transformation” and the image begins to possess higher-order cognitive, affective, and somatic characteristics (molar imagery). A conscious, cognitive examination of the inner picture is made through image appraisal. Stored memories of past experiences and subsequent learning combine to aid interpretation and provide meaning to the entire imagery experience. As a result, imagery affects physiological and psychological activities via neural pathways between the cerebral cortex, autonomic nervous system, and the reticular activating system (the seat of awareness and emotions). Images appear real and they create the same behavioral and mental sensations as would an image from reality. The focus of therapeutic work with imagery is the molar imaging operations that help to move people toward behavioral change (Heinkel, Rosenfeld, & Sheik, 2003; Strosahl & Ascough, 1981). New and unfamiliar experiences or situations can be practiced through imagery rehearsal with a future response programmed toward the real and actual situation.

The guided imagery intervention designed for use in this current study incorporated a higher-order, molar image of health for self-revaluation and restructuring of lifestyles. An image of health as positive energy and high vitality was examined for its effects on reducing smoking rates and increasing cessation and abstinence. Smith's (1981) definition of eudaimonistic health, or self-actualization, was the basis of the health imagery exercise with representations of general well-being, including future-oriented, health-promoting behaviors contributing to long-term life goals. Successful smoking cessation and weight control were associated with a eudaimonistic conception of health in previous research (Laffrey, 1986; Segall & Wynd, 1990); therefore, the eudaimonistic definition of health was emphasized in the guided health imagery intervention.

Methods

Sample

A sample of 72 participants was needed for a power of 85% (Cohen, 1988), with a significance level of .05, and an effect size of .25; oversampling by 10 compensated for an approximately 10% attrition rate in previous studies (Wynd,
Seventy-nine participants were initially enrolled in the study (35 in the control group and 43 in the intervention group), and a total of eight smokers resigned. A final sample size of 71 was achieved, with 33 participants in the attention placebo-treatment control group and 38 participants in the guided health imagery intervention group. Inclusion criteria were: (a) age 18 or older, (b) smoking history of at least five cigarettes per day for a minimum of 1 year, (c) written informed consent, and (d) residence within a 30-mile radius because face-to-face interventions and data collection took place in the participants' homes.

Adult smokers were recruited from a hospital outpatient clinic where they received routine health care. Participants were considered “healthy” in that they had no known type of smoking-related illness. Potential study participants were asked by research assistants to take part in the study. If the potential participant met inclusion criteria, the study was explained, written informed consent was obtained, and random assignment to either the control or intervention group was accomplished via a set of closed envelopes containing random numbers from the Microsoft Excel random number generator.

**Design and Procedures**

A repeated measures design was selected to examine differences between the guided health imagery group and the placebo-control group over 24 months. Six data-collection points included one preintervention (Time 1), when participants were recruited from the outpatient clinic and enrolled in the study, and initial data were collected. Next, interventions were provided in participants' homes over a 3-week period. Two postintervention data-collection points were at 1-week (Time 2) and 1-month after completion of the interventions (Time 3). Follow-up home visits and telephone calls were used to assess the repeated measures of smoking rates at 6, 12, and 24 months.

Research assistants were trained by the principal investigator to provide the placebo-control or imagery interventions. These assistants were kept separate from the research assistants who collected data and were blinded to the types of treatments being provided.

**Measures**

Demographic data included age, sex, ethnic background, marital status, socioeconomic status, and educational level. A smoking history questionnaire provided information about smoking rate, defined as the number of cigarettes smoked per day; the length of the person's smoking habit in years; and the person's age at the time of smoking initiation. For management and analysis purposes, data were entered into the Statistical Package for the Social Sciences (Version 10.0) for Windows.

Smoking rates were monitored through use of self-report data and were validated by corroborating reports from friends and family members. Friends and family members were introduced to the study during or immediately following initial data collection, and their informed consent was also obtained. The corroborating friends and family members were told that follow-up telephone calls would be made by the research assistants to evaluate participant smoking behavior. Participants who varied in their answers from their significant contacts or could not be reached by telephone were considered ongoing smokers and were included in the resulting relapse rates.

The Creative Imagination Scale (CIS) was used to evaluate the effective use of the guided health imagery by intervention group participants only as an assessment of intervention fidelity. The scale was not used to measure dependent variables or study outcomes. The CIS indicated participants' capacities for effectively using imagery to simulate reality (Barber & Wilson, 1979). Each participant was provided with five brief imagery exercises and was asked to compare the imagery experience with the actual experience (e.g., experiencing feelings of drinking cool, refreshing water). A four-point Likert-like scale was used to obtain responses from a score of 0, signifying that imagery and reality were “not at all the same,” to 4, meaning the comparison was “almost exactly the same.” Kiddoo (1979) used the CIS with 217 participants and found a test-retest reliability of .82 and a split-half reliability of .89. Wynd (1992b) established a Cronbach alpha of .87 with a sample of 76 participants. Internal consistency reliability for the current study was .84. In this study, average scores obtained for each of the five imagery scenarios ranged from 2.61 to 2.84, denoting imagery practice as fairly comparable with reality.

**Interventions**

Both intervention and placebo-control group members were given counseling and educational sessions that included facts about (a) smoking and health recovery following cessation, (b) preparing to quit, (c) establishing a “cold turkey” quit date, (d) how to deal with symptoms of recovery (withdrawal symptoms), (e) preventing relapse by managing cravings and urges, (f) diet, (g) exercise, (h) nutrition, and (i) developing a positive image after smoking cessation. Intervention group participants were taught guided health imagery and were provided with a 20-minute audiotape cassette of imagery exercises for practice before reinforcement sessions. Intervention group participants were also asked to maintain a record of guided health imagery practice on a special calendar. The dose and variety of guided imagery interventions outweighed that of the control group because the control group received no imagery information whatsoever. Also, the imagery education and training surpassed the amount and intensity of attention given to the control group. The intervention group received approximately 30 more minutes of attention and imagery intervention in order to train and reinforce group members' imagery practice.

The guided health imagery intervention protocol consisted of: (a) raising awareness about imagery abilities by envisioning childhood bedrooms from memory; (b) deep diaphragmatic breathing practice with 5-second inhalations and exhalations using the abdomen and diaphragm; (c) progressive
muscle relaxation exercises involving tension followed by full relaxation of each muscle group from head to toe to achieve a relaxed, accepting frame of mind. Once relaxed and open to the guided health imagery visualization, the interventionists used a 20-minute audiotape developed by Belleruth Naparstek (1993). This tape provided a guided health imagery exercise to lead participants through visualization of personal states of health and wellness. The emphasis was on feelings of high energy, happiness, and positive affirmations about health. Imagery also included visualizations about health-promoting activities such as smoking cessation and abstinence, good nutrition, stretching, breathing, exercising, enjoying objects and people in the surrounding environment, a life with purpose, and goals to become and remain healthy.

**Data Analysis**

A significance level of .05 was established for all statistical tests. Independent t tests and chi square were used to analyze initial differences between the two study groups on demographic characteristics, smoking rates, length of smoking habit, and age of smoking initiation. Repeated measures analysis of variance (ANOVA) was used to examine differences in smoking rates over time and to compare the guided health imagery group with the placebo-control group.

**Findings**

Statistical descriptions of the participants’ demographic and smoking histories are shown in Table 1. Independent t tests and chi-square analyses showed no significant differences between intervention and control groups at preintervention, Time 1.

At the 24-month follow up, the smoking abstinence rate for the intervention group was 26% (n=10) with a relapse rate of 48% (n=18) and 26% of the participants (n=10) continued to smoke (never made any attempt to quit). The abstinence rate for the control group was 12% (n=4) with a 33% relapse rate (n=11). Although the relapse rate was lower for the control group, 55% of the control group participants (n=18) continued to smoke and never made any attempt to quit. The difference between the two groups on abstinence rates was significant [χ²(df = 2) = 6.23, p < .05]. Repeated measures ANOVA showed a significant interaction effect for Group X Time with follow-up univariate ANOVAs indicating significant reductions in smoking rates for the intervention group at 1-month (Time 3) and at 24-months postintervention (see Table 2).

**Discussion**

Guided molar imaging of health appears to be useful for reducing smoking as a risk behavior, but replication and further research are needed to determine whether smoking cessation and other healthy lifestyle changes will continue to be produced through such interventions. Findings from the current study expand past research on guided imagery with smokers (Wynd, 1991, 1992a, 1992b). To date, these are the only reported studies examining guided imagery and smoking cessation.

Wynd (1992a) compared power imagery (power or self-control over smoking), relaxation imagery, and a placebo-control treatment with adults attending a six-session program. Immediate cessation rates were high, ranging from 67% in the power imagery group to 69% in the comparison relaxation imagery group. Only 27% of the placebo-control group members quit smoking. At the 3-month follow-up, smoking abstinence rates continued to be high for both imagery groups (52% and 55% respectively), and the control group remained at 27%. Unfortunately, the follow-up

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**Table 1. Study Participants (N = 71)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>f (%)</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>48.86</td>
<td>10.34</td>
<td>23</td>
<td>75</td>
</tr>
<tr>
<td>Smoking rate at beginning of study (cigarettes/day)</td>
<td>24.91</td>
<td>10.30</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>Age for beginning smoking</td>
<td>16.67</td>
<td>4.54</td>
<td>12</td>
<td>39</td>
</tr>
<tr>
<td>Length of smoking habit</td>
<td>30.88</td>
<td>10.23</td>
<td>8</td>
<td>53</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>44 (62)</td>
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<tr>
<td>Male</td>
<td>27 (38)</td>
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<tr>
<td>Marital status</td>
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<td>Married</td>
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<td></td>
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<tr>
<td>Single</td>
<td>6 (9)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Divorced</td>
<td>11 (15)</td>
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<tr>
<td>Widowed</td>
<td>2 (3)</td>
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<tr>
<td>Racial background</td>
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<tr>
<td>Caucasian</td>
<td>66 (93)</td>
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<tr>
<td>Other</td>
<td>5 (7)</td>
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<tr>
<td>Employment status</td>
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<tr>
<td>Employed</td>
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<tr>
<td>Unemployed</td>
<td>19 (27)</td>
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<tr>
<td>Retired</td>
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<tr>
<td>Sex education</td>
<td></td>
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</tr>
<tr>
<td>High school</td>
<td>48 (68)</td>
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<td></td>
</tr>
<tr>
<td>No high school</td>
<td>10 (14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>13 (18)</td>
<td></td>
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</tr>
</tbody>
</table>

**Table 2. Smoking Rates: Repeated Measures ANOVA for Group X Time and Univariate ANOVAs**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Repeated measures ANOVA</th>
<th>Smoking rates at 1-month</th>
<th>Smoking rates at 24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking rates</td>
<td>F (1, 69)</td>
<td>F (1, 69)</td>
<td>F (1, 69)</td>
</tr>
<tr>
<td>Smoking rates</td>
<td>4.79*</td>
<td>14.47**</td>
<td>8.04*</td>
</tr>
</tbody>
</table>

* p < .01, ** p < .001.
period was short and no further data were collected to evaluate long-term smoking abstinence. Also, the theory that power imagery could enhance power over smoking was not supported, but anecdotally, participants indicated they used both types of imagery for relaxation and stress reduction.

Because smokers in the first study (Wynd, 1992a) benefited from the stress-reducing qualities of imagery and the relaxation imagery group achieved higher cessation rates, a second study was designed to evaluate imagery, smoking relapse prevention, and stress reduction. Three booster sessions were offered for preventing relapse in smokers who completed a cessation program (Wynd, 1992b). A specific relaxation type of imagery was compared to a placebo-control group and smoking rates were measured with perceived stress scores over time. Repeated measures MANOVA showed significant main effects for imagery treatments, and stress scores were significantly reduced for the relaxation imagery group (from 28.27 to 23.20). Seventy-two percent of the imagery group and 51% of the control group remained abstinent after 3 months. Once again, however, participants were followed for only 3 months after cessation, and further data were not collected for thorough abstinence evaluation.

The current study attempted to correct and extend methods of follow-up from previous research by including a 24-month follow-up, and the actual study focus was sustained abstinence versus immediate cessation. A 26% smoking abstinence rate was achieved for the guided imagery group after 24 months, while the control group had a significantly lower abstinence rate of 12%.

The smoking research literature does not provide a standardized method for comparing smoking behavior change rates. Immediate cessation rates (quit rates) as well as abstinence rates are reported throughout the literature, thus increasing the difficulty with study comparisons. Currently, the most popular length for abstinence follow-up is 12 months, although most clinicians regard cessation as not final until after two smoke-free years (USDHHS Public Health Service, 2000).

Abstinence rates after 12 months were reported in two studies with methods somewhat similar to the current study. Hill, Rigdon, and Johnson (1993) compared various behavioral therapies and established 12-month abstinence rates ranging from 10% in the control group to 32% in the behavioral groups. In another study, a cognitive-behavioral mood management intervention resulted in a 34% abstinence rate at 12 months versus 18% abstinence in the group receiving standard care (Hall, Munoz, & Reus, 1994).

A meta-analysis of 633 smoking cessation studies (71,806 participants) showed an average observed cessation rate of 25% across all interventions examined, but the mean follow-up time period was not given (Viswesvaran & Schmidt, 1992). Mean quit rates ranged from 7% for physician counseling and advice, 15% for self-care methods, 17% for drug-based programs, 28% for instructional methods, 31% for smoke-aversion techniques, and 36% for professional hypnosis. Formal intervention programs were more successful than were self-help materials for producing smoking cessation and abstinence. Methods that incorporated individual values about lifestyle, health, and quality of life showed improvement over didactic instructional techniques with passive transmittal of facts about smoking risks and cessation.

The tobacco cessation guidelines produced by the Agency for Healthcare Research and Quality (USDHHS, 2000) indicate that cessation programs with the highest levels of effectiveness have included person-to-person contact interventions with individuals or groups. Successful interventions also provided practical skills for overcoming the smoking habit and offered ongoing support. The guided imagery intervention reported in the current study included both individual counseling through professional support and teaching a practical skill for relaxation and visualization of healthy behaviors and lifestyles.

Several limitations to the current research were noted. The study had intervention and placebo-control groups, both receiving three educational sessions. Although guided health imagery contributed to a significant difference between the two groups, a third control group receiving no attention may have improved the design by allowing for assessment of the dose-response variable. Both study groups received attention in the form of education about smoking and cessation, and although the type of intervention and dose were greater for the guided health imagery group, the actual influence of imagery was difficult to differentiate from the placebo-control group's educational sessions.

"Intention to quit" could be another factor inadvertently introduced to both study groups via the educational sessions, thus influencing study outcomes. Members of both groups might have intended to quit smoking. Intention to quit and expectations for success with cessation need to be assessed in future research.

Although self-reported smoking cessation rates are considered accurate (Velicer, Prochaska, Rossi, & Snow, 1992), as are reports from corroborating friends and family members (Hughes, 1992; Navarro, 1999), biological measures of smoking cessation offer greater reliability and more valid confirmation of self-reported smoking rates. Stevens and Munoz (2004) provided current information about biophysiological measurements useful for validating the accuracy of self-report in smoking studies. Such measures should be used in future cessation research.

Participants in the current study were recruited from a hospital outpatient clinic and were self-selected to take part in the research. Smokers who participate in cessation research might have attributes different from smokers motivated to quit on their own or who continue to smoke in a chronic and "hard core" fashion, unaffected by pressures for change. Results are therefore biased toward smokers who attend research sessions, and findings can be applied only to those smokers who are willing to participate in research about smoking cessation.

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Conclusions

Smoking is a complex behavior, and interventions for successful, long-term smoking abstinence are particularly important to the public’s health. Self-help methods, one-time counseling, and education about smoking risks might help some smokers, thus leading to initial smoking cessation, but these methods are often insufficient for maintaining long-term abstinence. Guided health imagery appears useful for successful cessation and abstinence but further research is needed to replicate and improve study methods. The use of biological validation of self-report, ongoing posttreatment monitoring of imagery practice, evaluation of intention to quit, and dose-response comparisons with no-treatment control groups are important methods to provide evidence for practice.

References


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