



# Assessing the Extent to Which Healthcare Workers Advised and Assisted Smokers to Quit Based on Patient Motivation Levels

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## Abstract

Smoking remains the leading cause of preventable death in the United States. Although healthcare workers play a key role in helping patients quit smoking, the degree to which they provide help varies. This study assesses the extent to which smokers report that their healthcare worker advised and assisted them with quitting based on their level of readiness to make a change.

The 2006 Hawaii Adult Tobacco Survey asked questions regarding smoking status and if advice and assistance with quitting was given from a healthcare worker.

Percentages for reporting healthcare worker's advice and assistance were compared among the three levels of motivational readiness using the chi-square test of association for 331 current, everyday smokers (56% women; 38% in the age group of 45–54 years). Most smokers are given advice to quit smoking. However, only about half of those motivated to quit are given assistance to do so. Most smokers across all motivation levels received advice to quit smoking with no significant difference between levels of readiness to quit. Less than half of smokers received any type of assistance with quitting smoking, with higher motivated smokers significantly receiving more assistance with cessation medication or nicotine replacement therapy and setting a quit date. This is a call to action for healthcare workers to address smoking with every patient. Adjustments to protocols for addressing smoking cessation and readiness to quit may be warranted.

**Keywords:** healthcare workers, motivation, smoking cessation

## INTRODUCTION

Smoking is one of the leading causes of preventable death from cardiovascular disease and cancer (U.S. Department of Health and Human Services, 2004). It is estimated that, in the United States, 46 million people or about 21% of all adults (aged 18 years and older) currently smoke cigarettes (Centers for Disease and Prevention, 2009).

The construct of motivation to quit smoking has been identified as a predictor of successful quitting (Osler & Prescott, 1998; Rose, Chassin, Presson, & Sherman, 1996). The stages of change (SOC) construct, which is part of the transtheoretical model, has been used to describe motivational readiness to quit (Prochaska, DiClemente, & Norcross, 1992). The SOC divides smokers into three categories of motivational readiness to quit: smokers in the precontemplation (PC) stage do not intend to quit smoking in the next 6 months; contemplators (C) are smokers who intend to quit in the next 6 months and (a) are not seriously intending to quit within the next 30 days or (b) have not made at least one 24-hour quit attempt in the past year, or both (a) and (b); and smokers in the preparation (P) stage are seriously intending to quit within the next 30 days and had at least one 24-hour quit attempt during the past year (Prochaska et al., 1992). Therefore, smokers in the PC stage have low motivational readiness to quit, smokers in the C stage have medium motivational readiness, and smokers in the P stage have high motivational readiness to quit.

Well-accepted, evidence-based guidelines for delivering tobacco cessation treatments in the primary care setting have been shown to be effective and are recommended as standard care (Fiore et al., 2008; Hollis et al., 2000; Katz et al., 2004; Lancaster, Stead, Silagy, & Sowden, 2000; Quinn et al., 2005, 2009; Stead, Bergson, & Lancaster, 2008). Healthcare workers (HCWs) are encouraged to help patients quit by implementing the “5As” of smoking cessation: (a) Ask all patients whether they use tobacco, (b) Advise all smokers to quit, (c) Assess smokers' willingness to quit, (d) Assist smokers with quitting, and (e) Arrange follow-up contact to prevent relapse. Adherence by an HCW to the first two As (Ask and Advise) has been shown to be over 70% but less so for the following three As (Assess, 39%; Assist, 39%; and Arrange, 2%; Simmons, Litvin, Unrod, & Brandon, 2012).

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Advice from an HCW to quit smoking has been shown to be effective in increasing quitting among smokers and should be directed at all smokers regardless of motivation level (Fiore et al., 2008; Kottke, Battista, DeCristofaro, & Brekke, 1988; Lancaster et al., 2000). HCWs have a unique opportunity to direct smokers toward the decision to stop smoking and assist them with successful interventions (Block, Hutton, & Johnson, 2000). Even brief advice from an HCW about quitting smoking will increase quit rates (odds ratio = 1.69, 95% confidence interval [1.45, 1.98]; Lancaster et al., 2000), and a patient's desire to quit smoking correlates with HCW advice to quit (odds ratio = 1.77, 95% confidence interval [1.24, 2.54]; Eckert & Junker, 2001).

Providing assistance to quit smoking is appropriate for smokers who are more motivated to quit smoking (Fiore et al., 2008; Woody, DeCristofaro, & Carlton, 2008). If a smoker is not ready to make a change, any attempt at an intervention will fail (Prochaska & DiClemente, 1983). Specifically, a smoker in the C stage should be offered educational materials regarding the risks of smoking, benefits of quitting, and cessation medication options. Smokers in the P stage should set a quit date, be offered cessation medication (both nonpharmaceutical and pharmaceutical aids), and referred to additional quitting support, such as calling a smoking cessation quitline for telephone counseling.

It is not well documented from past research how smokers at different levels of motivational readiness to quit receive the appropriate help with quitting smoking. Understanding this can provide direction for future training and policy initiatives within a healthcare setting to maximize on a patient's motivational readiness to quit. Therefore, this article extends previous work by assessing the extent to which HCWs provided advice to quit to all smokers and assistance with quitting to those who are more motivated to make a change.

## METHODS

The data presented in this analysis were derived from the 2006 Hawaii Adult Tobacco Survey (HATS) sponsored by the Hawaii Department of Health, Tobacco Prevention and Education Program. The HATS was a random-digit-dial telephone survey of the civilian, noninstitutionalized Hawaii population aged  $\geq 18$  years that was conducted from September 2006 to March 2007. The core HATS questions included questions about motivation to quit based on the SOC construct and HCWs' assistance in helping their patients quit defined by the 5As. This study was approved by the University of Hawaii Committee on Human Studies, and no parts of the HATS have been previously published.

## Participants and Procedures

Participants for this study were chosen through random digit dialing throughout Hawaii. Eligible participants for the telephone interview included adult (aged  $\geq 18$  years or over) smokers, former smokers, and those who have never smoked. Survey data were collected using a uniform, detailed telephone-calling protocol. Telephone numbers that had not received a final disposition code after at least 15 call attempts and that had

received at least three weekday calls, three weeknight calls, and three weekend calls were assigned a final disposition code of "unable to reach" and no longer called. Surveys were administered over a period of 7 months without longitudinal follow-up.

## Measures

Data from current, everyday smokers were used in this study and are defined as smokers who reported smoking 100 or more cigarettes in their lifetime and smoke every day. Questions were developed by the Centers for Disease Control and Prevention and the Hawaii State Department of Health's Tobacco Prevention and Education Program.

**Measure of Motivational Readiness to Quit Smoking.** The current study used the SOC construct as a measure of motivational readiness to quit smoking, which has been validated (DiClemente et al., 1991; Fava, Velicer, & Prochaska, 1995). For the purposes of this study, the SOC construct was adapted to define preparers as those who are seriously intending to quit within the next 30 days, regardless of a 24-hour quit attempt.

The questionnaire used in this study defined smokers in the PC stage as those answering "no" to "Are you seriously considering stopping smoking within the next six months?" Contemplators were categorized as answering "yes" to "Are you seriously considering stopping smoking within the next six months?" and by answering "no" to "Are you planning to stop smoking within the next 30 days?" Preparers were defined as those answering "yes" to "Are you planning to stop smoking within the next 30 days?"

**Measure of Providing Advice and Assistance With Quitting Smoking.** Five questions measuring whether advice and assistance with quitting smoking were provided were asked: In the past 12 months, did any doctor, nurse, or other health professional (for the purposes of this article, defined as an HCW) (a) provide advice not to smoke (advise); (b) provide smoking cessation materials (assist); (c) suggest that you use a smoking cessation class, program, quitline, or counseling and provide you with booklets, videos, or other materials to help you quit smoking on your own (assist); (d) prescribe or recommend using nicotine replacement therapy (NRT; such as the nicotine patch, nicotine gum, nasal spray, or inhaler) or cessation medication (assist); and (e) suggest that you set a specific date to stop smoking?

Participants could respond as "yes," "no," or "don't know." "Don't know" responses comprised less than 5% of responses and were excluded from the analysis.

## Analysis

Available data allowed for bivariate (contingency table) comparisons of motivation level by HCW assistance using chi-square tests. All *p* values are two sided with significance defined at the .05 level.

## RESULTS

### Participant Characteristics

A total of 3,965 participants completed the telephone survey (63.1% women; mean age = 53 years, *SD* = 16.1 years). The cooperation rate (number of interviews conducted divided by

TABLE 1 Participant Demographics		
	<i>N</i>	%
Current, everyday smokers	331	100
	<i>n</i>	%
Level of Motivation		
Precontemplators	163	49
Contemplators	100	30
Preparers	68	21
Gender		
Male	146	44
Female	185	56
Age group, years		
18–24	9	3
25–34	34	10
35–44	55	17
45–54	120	36
55–64	74	22
65+	39	12

the number of eligible respondents contacted) was 63.9%, and the response rate (number of interviews conducted divided by the number of eligible respondents, including those not reached) was 36.3%. Of the 3,965 people who completed the survey, 387 people were current, everyday smokers; 110 smoked some days; and 1,292 did not smoke at all. Missing responses to this question were 1,789. This study focused on

current, everyday cigarette smokers ( $N = 387$ ), excluding those that smoked some days, nonsmokers, and participants who did not answer this question. Out of these 387 current, everyday smokers, 331 reported a level of motivation to quit, representing the final study population. Most current, everyday smokers with a reported motivation level were women (56%). Most participants were in the age group of 45–54 years (36%), followed by 55–64 years (22%). Only 3% of the participants were in the age group of 18–24 years. In the analysis of motivation level, it was found that 49% of smokers were in the PC stage, 30% were in the C stage, and 21% were in the P stage (see Table 1 for participant demographics).

### HCW Providing Advice and Assistance With Quitting Smoking

Table 2 displays the rates of advice and assistance that were provided to smokers by motivation level. A total of 235 (71%) smokers answered the question about whether they received advice from their HCWs to quit smoking, with 76% answering “yes.” No significant differences were found between motivation level of smokers that reported receiving advice to quit smoking (48% of PC, 28% of C, and 24% of P;  $\chi^2[2,235] = 2.9, p = .23$ ).

A total of 177 (53%) smokers reported on whether their HCWs provided them with smoking cessation materials. Thirty-three percent (33%) of smokers reported that their HCWs provided them with cessation materials. A significant difference ( $\chi^2[2,177] = 8.4, p = .01$ ) between motivation level was found for smokers reporting that they were offered cessation materials. Thirty-seven percent of PC and P were offered materials, whereas only 25% of C were offered cessation materials.

TABLE 2 Advice and Assistance Provided to Smokers by Motivation Level						
	Rate of Responding Yes, Total <i>N</i> = 331 (%)	Precontemplator	Contemplator	Preparer	Total	Chi-Square
Provided advise not to smoke (Advice)	235 (71)	85 (48)	50 (28)	43 (24)	178 (76)	$\chi^2(2,235) = 2.9, p = .23$
Provided smoking cessation materials (Assist)*	177 (52)	22 (37)	15 (25)	22 (37)	59 (33)	$\chi^2(2,177) = 8.4, p = .01$
Referred to a smoking cessation class, program, quitline, books, videos, or counseling (Assist)	173 (52)	24 (41)	14 (24)	20 (35)	58 (34)	$\chi^2(2,173) = 5.6, p = .06$
Recommend to use nicotine replacement therapy or quit smoking medication (Assist)*	177 (53)	19 (33)	17 (30)	21 (37)	57 (32)	$\chi^2(2,177) = 9.1, p = .01$
Recommend to set a quit date (Assist)*	176 (53)	17 (32)	17 (32)	19 (36)	53 (30)	$\chi^2(2,176) = 9.2, p = .01$
*Significant differences found between motivation level at $p < .05$ .						

A total of 173 (52%) smokers answered the question about whether their HCWs suggested that they use a smoking cessation class, program, quitline, or counseling. Thirty-four percent of smokers answered "yes" to this question, with no significant differences between motivation level found (41% of PC, 24% of C, and 34% of P;  $\chi^2[2,173] = 5.6, p = .06$ ).

A total of 177 (53%) smokers responded to whether their HCWs prescribed or recommended that they use NRT or cessation medication. Only 32% of smokers reported that their HCWs prescribed or recommended that they use NRT or cessation medication. A significant difference ( $\chi^2[2,177] = 9.1, p = .01$ ) was found between motivation level of smokers. Just fewer than 40% of P reported that their HCWs prescribed or recommended that they use NRT or cessation medication, whereas 33% of those in the PC stage and 30% in the C stage reported this.

Out of the 176 (53%) smokers who answered the question regarding recommendations from their HCWs to set a quit date, 30% responded with "yes." A significant difference ( $\chi^2[2,176] = 9.2, p = .01$ ) between motivation level was found for smokers answering "yes" to this question. Thirty-six percent of P reported that their HCWs recommended to them that they set a quit date, and 32% of PC and C reported this.

Analysis revealed that there were no significant differences between gender for receiving advice or any type of assistance with quitting (all  $ps > .05$ ). A significant difference was found between smoker age groups for setting a quit date ( $\chi^2[5,176] = 21.4, p = .001$ ). A post hoc analysis was run using a logistic regression with setting a quit date (yes or no) as the outcome and age category as the predictor variable. The youngest category was excluded as this only had an  $n = 4$ . The regression was significant (Wald[4] = 16.70,  $p = .002$ ). Using the youngest age category of 25–34 years as reference (with 37.5% setting a quit date), the age categories of 35–44 (69.2% setting a quit date) and 55–64 (82.9% setting a quit date) years were significantly different ( $p < .05$ ), and the category of 45–54 years (60.0% set a quit date) was marginally ( $p = .06$ ) different.

## DISCUSSION

The analysis examined the extent that advice and assistance with quitting smoking was provided based on a patient's level of motivational readiness to change. This is important for assessing if smokers are receiving the relevant help that they need from their HCW to successfully quit smoking.

Most (76%) smokers received advice to quit smoking, which is consistent with other research findings indicating that HCWs typically offer advice to all smokers during a visit (Curry, Orleans, Keller, & Fiore, 2006; National Committee for Quality Assurance, 2007; Stevens et al., 2005). However, when stratified by motivation level, only half of smokers in the PC stage and even fewer in the C and P stages received advice to quit (although these differences were not significant). Yet, according to recommended guidelines for helping patients quit, all smokers regardless of motivation level should be advised to quit (Fiore et al., 2008; Woody et al., 2008). A possible explanation for this

unique finding is that HCWs may already assume that a patient with higher motivation already wants to stop smoking and does not need to be advised to quit. This is an area that warrants further research to fully understand this finding.

Past research has indicated that assistance is appropriate for those who are more motivated to quit smoking (Fiore et al., 2008; Woody et al., 2008), yet less than half of motivated smokers in this sample reported receiving any assistance for smoking cessation from their HCW. This finding could be due to several reasons. First, HCWs may have low confidence in how to address smokers (Browning, Ferketich, Salsberry, & Wewers, 2008; Spangler, George, Foley, & Crandall, 2002) possibly because of lack of training on how to address smoking cessation with patients (Browning et al., 2008). In addition, patients who have made past quit attempts may be perceived as more likely to quit smoking (Meredith, Yano, Hickey, & Sherman, 2005). Conversely, groups with a higher prevalence of smoking, including patients who are poor, less educated, and in poor health, may be perceived as having less probability of quitting (Parnes, Main, Holcomb, & Pace, 2002). A second explanation could be due to provider bias toward smokers in general. Some HCWs may view smoking as a personal lifestyle choice, and therefore, smokers are responsible for the health consequences of their behaviors (Underwood & Bailey, 1993). With increasing stigma against smoking, HCWs may hold a negative and pessimistic attitude toward smokers (Lev-Ran, Adler, Nitzan, & Fennig, 2013). Third, racial and ethnic disparities that exist in the healthcare setting may contribute to differences seen in assistance with quitting, possibly because of language or social discordance between the patient and the HCW (Browning et al., 2008; Zhu, Melcer, Sun, Rosbrook, & Pierce, 2000). Along these same lines, environments such as health clinics that provide care to low-income or minority patients tend to be more busy and chaotic, leading to limiting time to address smoking with these groups of patients (Vogt, Hall, & Marteau, 2005). Finally, there are barriers to providing assistance to the smoker within the healthcare setting, such as HCW time constraints, limited administrative support, case management issues, provider and patient situational differences, and lack of resources to support cessation effort (Manfredi & LeHew, 2008).

A significant difference between motivation levels was found for smokers who reported that their HCW offered cessation materials, recommended NRT or cessation medication, and recommended that they set a quit date, with smokers in the PC stage reporting the highest percentage (except for offering cessation materials where PC and P were of the same percentage). This is an interesting finding, as past research has indicated that assistance should only be made to smokers ready to quit (Fiore et al., 2008; Woody et al., 2008). Additional research is warranted on the effect of offering materials and NRT to those not ready to quit.

It has been suggested that older smokers may receive help with smoking cessation more often than younger smokers (Browning et al., 2008; Quinn et al., 2009). This could be a result of older smokers having more interest in quitting, whereas younger smokers may encounter increased social pressures to



smoke and be less motivated to quit (Hughes, Marcy, & Naud, 2009; Zhu et al., 2000). Nonetheless, the possible gap in services offered to patients of different ages indicates that HCWs may need to tailor protocols for addressing readiness to quit according to age group. However, in our sample, we only found a significant difference between age group for those setting a quit date with their HCW. Smokers in the age group of 35–64 years were more likely to set a quit date with their HCW compared with younger and older smokers.

Limitations to this study exist. Any influences of directionality, such as whether the discussion about smoking was instigated by the HCW or by the patient, could also be in the other direction. Second, the SOC at the time of the survey may not be reflective of the SOC at the time of the visit with the HCW, potentially introducing confounders into the study results. Third, the type of medical care site where the intervention occurred and the type of healthcare provider were unknown. It is possible that smokers in different stages may receive medical care in different types of medical sites (such as an inpatient or clinic setting) or from different types of HCWs (such as a registered nurse, nurse practitioner, or physician). Fourth, we did not include in the analysis the number of cigarettes smoked per day and how this may correlate with receiving smoking cessation counseling. Fifth, the SOC model defines smokers in the P stage as planning to quit in the next 30 days and having at least one 24-hour quit attempt in the past year (Velicer et al., 1995). However, the HATS defined smokers in the P stage as only planning to quit in the next 30 days, regardless of a past 24-hour quit attempt. The P stage combines intention and behavior change, which was not captured in the HATS definition. This may mask true differences between the C and P stages. Finally, bias, such as social desirability, may have been introduced into the study as a result of self-reported data and recall. However, research has indicated that self-reporting of smoking behaviors tends to be accurate (Patrick et al., 1994).

The overall results indicate that most smokers across all levels of motivation readiness are given advice to quit smoking. However, only about half of those motivated to quit are given assistance to do so. This is a call to action that HCWs need to be more proactive in engaging smokers in cessation beyond just advising them not to smoke. Adjustments to protocols or policy initiatives for addressing smoking cessation and readiness to quit may be warranted.

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