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Prompting Depression Treatment Seeking among Smokers: A Comparison of Participants from Six Countries in an Internet Stop Smoking RCT

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Websites containing information and advice about health are increasingly common and popular. It is important to understand whether the material these sites contain can positively influence individual behavior, and whether populations differ in their response to that material. Participants in an international web-based stop smoking randomized controlled trial (RCT) were screened for major depression; participants whose history and/or depression symptoms were deemed of concern were offered one of two prompts (Strong and Mild) to seek treatment, depending on depression history. Participants from 3 predominantly English-speaking and 3 predominantly Spanish-speaking countries were analyzed. Individuals given a Strong prompt were more likely to seek treatment for depression than those given a weak prompt (16.6% vs. 10.2% of previously untreated individuals reported seeking treatment), controlling for symptom level and other variables. Country-specific differences were observed, with participants

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from South Africa and Spain departing from the common pattern of Strong prompt leading to higher likelihood of treatment seeking. Older age and female gender, but not symptom level predicted higher likelihood of seeking treatment following a prompt. The results suggest that information provided by the health websites can promote help seeking in affected individuals.

KEYWORDS behavior change, cross-national, smoking cessation, treatment seeking

Smoking is a major cause of death and disability internationally (World Health Organization, 2008). Smoking and depression are frequently comorbid (Pratt & Brody, 2010), and receiving treatment for depression may help smokers quit and stay quit (Hebert et al., 2011). An estimated 50% of people with depression in the United States, and 75% worldwide, are undertreated (Kessler et al., 2003). Undertreatment may reflect availability of services and national resources as well as cultural norms. Studies also suggest that many depressed individuals elect to forgo or defer treatment, with some reports showing that depressed individuals struggle for 10 years on average prior to seeking treatment (Mark, Shern, Bagalman, & Cao, 2007). Factors shown to affect a person's decision to seek services include symptom level (Dew, Dunn, Bromet, & Schulberg, 1988), stigma (Barney, Griffiths, Jorm, & Christensen, 2006; Sherwood, Salkovskis, & Rimes, 2007), and, importantly, lack of mental health literacy (Weich, Morgan, King, & Nazareth, 2007), with some individuals being unaware that their symptoms indicate a serious disorder, such as depression.

As increasing number of individuals search online for health topics, both to get information as well as to find quality advice, it is important to understand whether online information can affect individual behavior. Furthermore, considering Internet's global reach, understanding the similarities and differences of populations can inform efforts to direct people to much-needed care for depression. The present study is based on a large sample of English- or Spanish-speaking smokers participating in an Internet-based smoking cessation trial. At baseline as well as at follow-up, participants were screened for the presence of depression and asked about depression treatment; many were given automated prompts to seek care for depression. Participants from six countries, three of which were largely English speaking (United States, India, and South Africa), and three—Spanish speaking (Spain, Argentina, and Mexico) were analyzed. Baseline characteristics, including country of residence, were examined to determine the predictors of treatment seeking after being prompted to do so. We hypothesized that there will be measurable differences in treatment seeking between the six countries.

METHODS

Participants

Over 17 thousand ($n = 17,497$) participants from 168 countries joined an Internet-based smoking cessation trial, conducted in English and Spanish. For this report, we retained three countries with the largest number of participants for each language. Thus, the 2,334 English-speaking participants are represented by India (n = 415), South Africa (n = 336), and the United States (n = 1,583); the 9,343 Spanish-speaking participants are represented by Argentina (n = 2,620), Mexico (n = 2,215), and Spain (n = 4,508).

Measures

Demographics questionnaire assessed participants' age, gender, race, work status, education, and marital status, as well as other demographic information.

The major depressive episodes (MDEs) Screener (Muñoz, 1998) is an 18-item self-report measure designed to screen for the presence of current and past MDEs. It rates the presence of nine symptoms of depression according to the DSM-IV (DSM-IV; American Psychiatric Association, 1994) over a 2-week period and assesses whether Criterion C (significant impairment in functioning) is met within the same time span. Both current and lifetime presence of an MDE are assessed.

The *Center for Epidemiological Studies–Depression* scale (CES-D; Radloff, 1977) is a widely used 20-item self-report scale that measures the current level of depressive symptoms.

Depression treatment history asked whether participants have sought treatment for depression, and the type of practitioner they saw.

Study Procedures

The study procedures (approved by the university IRB) are detailed in Muñoz, Barrera, Delucchi, Penilla, and Pérez-Stable (2009), which described a smaller sample of this study. Briefly, participants responded to an online advertisement carried out chiefly using worldwide Google AdWords campaigns, for a free Internet-based smoking cessation study. Eligible participants were 18+ years of age, smoking 5+ cigarettes per day, with at least once-weekly access to e-mail, and indicating their readiness to quit within the next 30 days. After giving informed consent, participants were randomized into four conditions (see Muñoz et al., 2009). Participants were not compensated for participation in the study. The study URLs were http://stopsmoking.ucsf.edu (English) and http://dejardefumar.ucsf.edu (Spanish).

Participants' smoking, depression, and depression treatment were reassessed at 1, 3, 6, and 12 months post quit date via e-mailed invitations to return to the site and complete follow-up surveys. For the first 500

English-speaking and the first 500 Spanish-speaking participants, phone follow-up was attempted if the online survey was not completed.

Treatment seeking prompts

Based on responses to the depression instruments, participants were given feedback on their depression and its possible impact on smoking cessation. Participants may have received one of two prompts to seek treatment for depression based on their responses to the MDE Screener: "Strong" or "Mild" (see Appendix). Those who screened positive for current depression, as well as those who screened positive for past depression and had endorsed 5 or more DSM-IV current depression symptoms or Criterion C (which addresses severity of symptoms by asking whether the symptoms "interfered with your life or activities a lot") were given a "Strong" prompt. Those who endorsed either current or past Criterion C, or endorsed 5 or more DSM-IV past depression symptoms (but did not meet criteria for the "Strong" prompt) were given a "Light" prompt. Those not meeting the above criteria, even in the presence of elevated symptoms as measured by the CES-D, were not prompted to seek care; these participants (only 6.1% of whom reported seeking depression treatment at follow-up) are omitted from this report.

Data Analysis

Analyses were limited to participants who were treatment-naïve at baseline, because it was not possible to determine whether those with previous treatment had sought new treatment at follow-up or continued with existing treatment. The variable of interest (Sought/Did not seek treatment) was examined in relation to participants' characteristics either hypothesized to predict treatment seeking on the basis of previous findings (e.g., age, gender), or presumed to affect treatment seeking (e.g., the strength of the treatment-seeking prompt). A logistic regression model was constructed, with treatment seeking as the dependent variable, predicted from prompt (Strong or Light), country of residence, gender, job status, and relationship status, randomization to conditions which included a mood management component, and follow-up (live or automated), and covarying age, education level, and the CES-D score. Two-way interactions between country of residence and other predictors were examined to test for moderating effects of country of residence; nonsignificant interactions were removed to examine main effects.

RESULTS

Participant Demographic and Clinical Characteristics

Participant's demographic and depression characteristics are presented in Table 1. U.S. participants were the oldest ($F(5,11670) = 71.3$, $p < 0.001$), least likely to be working ($chi^2(5) = 361.1$, $p < 0.001$), and most likely to be female

($chi^2(5) = 677.9$, $p < 0.001$). Indian participants were the most educated ($chi^2(5) = 1013.6$, $p < 0.001$), least likely to be in a relationship ($chi^2(5) = 54.9$, $p < 0.001$), and smoked fewest cigarettes daily ($F(5,11670) = 144.9$, $p < 0.001$); the Indian subsample also had fewest women (6.0%).

Participants from India were most likely to screen positive for current MDE ($chi^2(5) = 182.1$, $p < 0.001$) and had highest depressive symptoms ($F(5,11647) = 26.4$, $p < 0.001$). U.S. participants who screened positive for current or past MDE were most likely to have been treated at baseline ($chi^2(5) = 244.5$, $p < 0.001$), by their primary care physician ($chi^2(5) = 113.8$, $p < 0.001$), and with antidepressants ($chi^2(5) = 126.3$, $p < 0.001$). Indian participants with current or past depression were least likely to be treated for depression or take antidepressants. Participants from Argentina were most likely to have been treated by a psychologist ($chi^2(5) = 73.7$, $p < 0.001$).

Predictors of Prompted Treatment-Seeking

Of the participants from the six countries, 9,142 were treatment-naïve at baseline (United States: 58.9%, India: 85.5%, South Africa: 69.6%; Spain: 84.2%, Argentina: 78.8%, Mexico: 81.5%). Of these, 41.7% were given either a Light (25.7%) or a Strong (16.0%) prompt to seek treatment.

There was greater variability in the proportions of participants receiving the Strong prompt (United States: 10.2%, India: 23.9%, South Africa: 9.9%; Spain: 12.9%, Argentina: 19.8%, Mexico: 20.5%), than the Light prompt

TABLE 1 Participant baseline characteristics, by country

	English-speaking			Spanish-speaking		
	USA (n = 1,583)	India (n = 415)	S. Africa (n = 336)	Spain (n = 4,509)	Argentina (n = 2,620)	Mexico (n = 2,215)
Mean Age (yrs)	40.1 (11.8)	31.2 (9.2)	34.4 (10.2)	35.2 (9.5)	36.6 (11.2)	35.8 (11.0)
% women	63.4	6.0	48.2	55.7	47.6	35.6
% bachelors+	33.1	86.1	30.4	35.6	27.3	60.6
% in relationship	59.8	46.0	57.9	57.4	53.2	51.4
% working	62.1	74.2	83.9	82.5	83.6	81.3
# of cigarettes/day	20.0 (10.0)	13.6 (7.7)	20.4 (10.3)	21.5 (9.8)	22.1 (10.5)	16.3 (8.4)
% baseline MDE	30.2	33.0	24.8	27.3	33.3	30.1
Current MDE	10.3	22.3	10.1	12.7	19.1	19.4
Past MDE only	19.9	10.7	14.6	14.6	14.2	10.7
CES-D score	15.0 (11.8)	19.4 (12.1)	16.1 (11.8)	15.5 (11.7)	18.0 (11.8)	17.2 (12.4)
% Tx at baseline[a]	71.1	22.8	56.6	35.6	39.4	31.8
If YES: PCP[a]	61.9	32.3	59.6	39.0	27.5	26.8
Psychiatrist[a]	44.2[+]	38.7[+]	29.8[+]	48.9[+]	47.4[+]	38.8[+]
Psychologist[a]	34.8	19.4	43.2	53.0	64.0	55.5
Other MHP [a]	21.5	3.2	2.1	3.9	3.8	6.2
Other[a]	4.7	38.7	4.3	7.3	9.9	20.6
Current antidepr.[a]	31.8	4.4	25.3	18.9	14.5	9.3

Note. For all comparisons, $p < 0.001$ except [+] = $p < 0.05$; [a] = Those with current or past MDE; PCP = primary care physician; MHP = mental health professional; Tx at baseline = in treatment at baseline.

(United States: 21.6%, India: 23.1%, South Africa: 23.2%; Spain: 25.2%, Argentina: 30.1%, Mexico: 24.9%), $chi^2 = 183.2$, $p < 0.001$, due to the differences we identified in current and past depression rates between the countries. India was the only country that received more Strong than Light prompts (23.9% vs. 23.1%), reflective of the greater rates of current depression. Of the participants who were treatment-naïve at baseline, received a prompt, and provided follow-up data (N = 1,871), 10.2% reported seeking treatment at any follow-up assessment after the Light prompt, and 16.6% sought treatment following the Strong prompt (Figure 1). Thus, across all six countries, receiving a stronger prompt predicted greater likelihood of seeking treatment in a logistic regression model (Wald $chi^2 = 9.32$, $p < 0.002$, OR = 1.66, 95%CI: 1.20–2.30), controlling for other variables, including the level of depression (CES-D score).

To understand country-specific differences in responses to prompts, we tested the interactions between country of residence and the other predictors. Country of residence interacted with the strength of the prompt to predict treatment seeking at follow-up in a logistic regression model (Wald $chi^2 = 14.36$, $p < 0.02$). As illustrated in Figure 1, for participants from four of six countries stronger prompt predicting greater likelihood of treatment seeking, as expected; this was especially true for Mexican participants. Spanish participants, however, did not seem to distinguish between prompts, and South African participants receiving the Light prompt sought treatment at higher rates than those receiving the Strong prompts. Because all

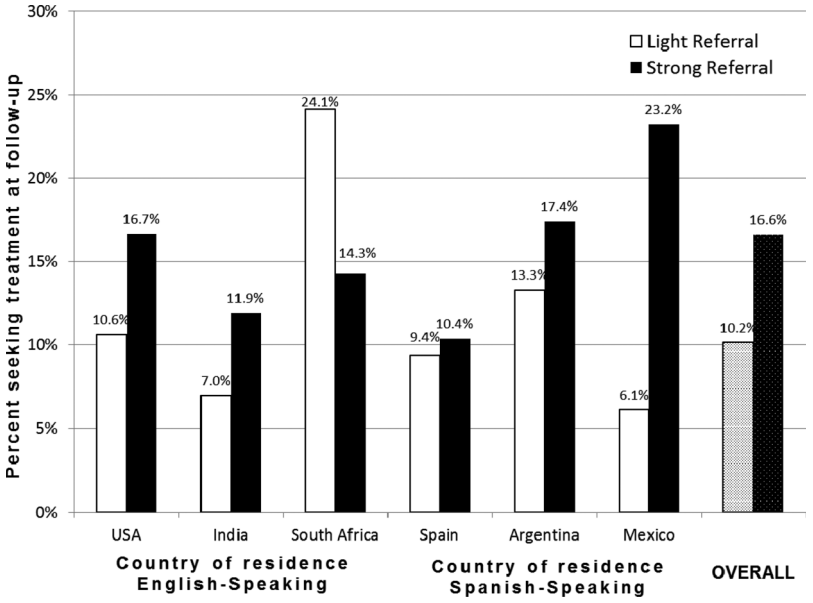

FIGURE 1 Country of residence and strength of the prompt to seek treatment interact to predict treatment seeking at follow-up.

English-speaking participants received the same wording of the English prompts, and all Spanish-speaking participants received the same wording of the Spanish prompts it is likely that cultural factors may have played a role in these differences. No other interactions were significant. Of the main effects, being older predicted greater likelihood of seeking care in a logistic regression model (Wald $chi^2 = 5.04$, $p < 0.03$, OR = 1.02, 95%CI: 1.00–1.03), with every year of age increasing the likelihood of seeking treatment by 2%, as did female gender (Wald $chi^2 = 5.04$, $p < 0.03$, OR = 1.4, 95%CI: 1.04–1.89). Interestingly, CES-D score did not predict increased treatment seeking in a logistic regression model (Wald $chi^2 = 0.79$, $p = 0.38 > 0.05$, OR = 1.01, 95%CI: 0.99–1.02).

We further tested whether the language of the prompt predicted treatment seeking, but found that it was not the case. Neither the interaction of language with the strength of the prompt (Wald $chi^2 = 0.29$, $p = 0.59 > 0.05$), nor language as a main effect (Wald $chi^2 = 0.30$, $p = 0.58 > 0.05$, OR = 1.13, 95%CI: 0.74–1.71) with the interaction removed were significant in logistic regression models.

DISCUSSION

This study found that stronger online prompts to seek treatment generally resulted in greater likelihood of seeking care. However, our findings also indicate country differences in response to prompts to seek treatment. In particular, South African participants responded best to the light prompt and Mexican participants—to strong prompts to seek treatments. Our results suggest differences in the ways individuals from different countries respond to prompts. Reasons for these differences might include differences in the availability of care between high- and middle-income countries. Other reasons may be cultural as in the case of Mexican participants who may respond especially strongly to a perceived expert or authority (Arredondo et al., 1996). Our diverse sample is a strength of this study, highlighting potential future avenues of investigation to understand differential response to prompts of individuals from different countries.

A concern has been voiced that individuals might forgo traditional treatments if they are exposed to interventions online. Our findings suggest the contrary—26.8% individuals who were prompted to seek treatment did so. Furthermore, being randomized to a condition that included access to a mood management intervention did not reduce treatment seeking. A stronger prompt increased treatment seeking for most participants, even when controlling for symptom intensity, which suggests that the particulars of the prompt, rather than symptom level, influenced participants. As more people search for health information online, the finding that they may respond to a helpful prompt is encouraging because it demonstrates that online information can positively influence health care behavior.

Older age and female gender appeared to be universal predictors of treatment seeking, which is consistent with previous findings (Bristow & Patten, 2002). Importantly, the differences found in this study were based only on individuals who received a prompt (therefore having symptoms or risk factors), suggesting that factors other than higher prevalence of depression in women differentially affects service seeking for men and women. Perhaps older individuals, having attempted to cope with depression on their own, might become convinced that they are unable to do so without help. Alternatively, younger participants may find standard treatments for depression unappealing; they may also be less likely to follow expert suggestions or consider information obtained on the internet as authoritative.

This study has several limitations. Participants were smokers recruited for an Internet-based smoking-cessation study; the results may not generalize to nonsmokers. For some participants English or Spanish may not have been their native language, which may have influenced their results. Given that it is a worldwide study with several thousand participants, it was impossible to verify the identity of each participant. While it is possible that there was fraud or duplication it is unlikely, mainly due to the fact that participants were not compensated and thus had low motivation for fraud. Participation, which includes filling out surveys, reading online materials, etc., would likely only appeal to those who genuinely wished to do so. The MDE Screener was not standardized in each of the six countries, which may have influenced the results. The prompts to seek treatment for depression were limited to two levels of urgency. Future research should address how greater variability in prompts predicts treatment seeking. The strength of the prompt was driven by participants' depression symptoms; though symptom level was controlled in our analyses, a more powerful experiment would involve randomizing participants to receive prompts of different strengths. We did not do so because of ethical concerns.

The results of this study suggest both similarities in treatment seeking across a multinational sample of individuals, as well as distinct differences. Given the toll of depression, it is imperative to understand the factors that interfere with suffering individuals receiving much-needed care, and work to provide effective interventions to all those in need. Our results also highlight the potential of websites that screen for health problems and provide encouragement to seek care to increase the number of affected individuals who obtain needed services.

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APPENDIX
LIGHT AND STRONG PROMPTS TO SEEK CARE

Light Prompt:
{Discussion of the endorsed responses} … you should consider getting some help. There is no need to go it alone. If things get worse, let your primary care physician know that you are having several depressive symptoms, and ask him or her 1. if he or she knows how to treat depression, or 2. if he or she can refer you to a specialist on depression. If you already see a professional about depression, and things get worse, you might consider updating him or her about how things are going. This may help you to avoid serious problems with your mood, as well as help you in your effort to quit smoking.
Strong prompt:
{Discussion of the endorsed responses} … you might consider, as part of your effort to quit smoking, letting your primary care physician know about these problems, and ask him or her 1. if he or she knows how to treat depression, or 2. if he or she can refer you to a specialist on depression. If you already see a professional about depression, you might consider updating him or her about how things are going. There are treatments that are successful with depression and there is no need to go it alone. Getting help may help you deal with depression, as well as help you in your effort to quit smoking.