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Letter to the Editor

Cigarette smoking among patients with chronic diseases ☆

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Tobacco dependence and chronic diseases are highly prevalent and each are top causes of morbidity and mortality in the world [1,2]. Tobacco use is also a modifiable risk factor for many chronic diseases including cardiovascular disease, diabetes, and inflammatory diseases [3–5]. In a 1999–2008 sample of U.S. citizens, 26% of diabetics smoked. Younger age, less education, more alcohol consumption and less physical activity, and symptoms of major depression increased their odds for smoking [6]. The prevalence of smoking among people with other chronic diseases, and with overlapping chronic diseases, is less well documented. A better understanding of comorbid tobacco use and chronic illnesses is important for higher income countries, where both are highly prevalent, and is also vital for system planning in middle income countries, where tobacco use is prevalent [2] and the incidence of chronic illness is on the rise [1].

We conducted a population-based survey of all patients attending a leading regional center for chronic conditions—*Centro HIPERDIA Minas* in Juiz de Fora (CHDM-JF) in the state of Minas Gerais, Brazil. CHDM-JF is a leading public secondary care facility affiliated with UFJF. It focuses on interdisciplinary treatment of diabetes, hypertension, and chronic kidney disease (CKD). This type of center is the middle link in the universal health care system in Brazil, which consists of primary, secondary, and tertiary (hospital) care facilities.

All CHDM-JF patients with scheduled appointments over a 3-month period, who were older than 18 years, were eligible and invited to participate. At CHDM-JF all patients check in at a central reception area, and patients' progress through visits with the multidisciplinary treatment team is tracked in a central location. Brazilian research assistants (RAs) screened for eligibility, explained the purpose of the study, invited eligible patients to participate, collected written consent, and verbally administered the survey. All study procedures were approved by the ethics committees at the University of Kansas Medical Center (#12787) and the Federal University of Juiz de Fora (#283/2011).

The survey consisted of items from international health assessments and screenings that had been validated in Brazilian Portuguese [7–11]. Data were recorded by RAs on paper forms, double-data entered into REDCap, and downloaded into Stata for cleaning and analysis [12,13].

Analyses included descriptive statistics, chi-square tests and t-tests. Tobacco use patterns were examined by number of chronic diseases. The percentage of patients who met Brazilian treatment guideline criteria for cessation medication was calculated. Generalized Linear Models were used for analysis comparing patient characteristics according to number of chronic diseases. The survey was conducted in 2012 and analyzed in 2013.

Over the 3-month study period, nearly all eligible patients (1584–98%) visiting the clinic participated in the survey. Smokers (N = 160) had a very low level of education and high rates of depression (Table 1). Most were being seen for hypertension (58.8%), followed by diabetes (48.8%) and CKD (33.8%). Comorbid chronic disease was the norm: 38.1% reported they had 1, 53.1% reported they had 2, and 8.8% reported they had 3 (data not shown).

Patients were highly interested in quitting and most were daily but light smokers (Table 1). Nearly all (98.1%) lived with another smoker

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Table 1
Sample, smoking patterns and history, and medication eligibility (N = 160).

Sociodemographics[a]	
Age mean (SD)	55.24 (±11.69)
Female	86 (53.8%)
Education	
Less than elementary/middle school (<8 grades)	114 (71.3%)
Middle school (≥8 grades)	14 (8.8%)
High school	26 (16.3%)
Technical school	3 (1.9%)
University degree	2 (1.3%)
Post-graduate education	1 (0.6%)
Medical history	
Receiving treatment from CHDM-JF for:	
Hypertension	94 (58.8%)
Diabetes	78 (48.8%)
Chronic renal disease	54 (33.8%)
Mental health comorbidities	
PHQ-2: depression	72 (45%)
AUDIT-C: high risk drinking[b]	21 (13.12%)
Smoking history[c]	N = 160[d]
Age started smoking, mean (SD) (N = 159)	16.66 (±7.95)
Current cigarettes per day, mean (SD)	14.1 (±9.02)
Light smokers (<10 cigarettes per day)	51.88%
Daily smoker (smoked every day, past 30 days)	141 (88.13%)
Fagerström Test for Nicotine Dependence (FTND), mean (SD)	4.3 (±2.1)
Carbon monoxide, parts per million mean (SD)	12.41 (±6.62)
Additional use of other forms of tobacco	
Hand-rolled cigarettes	12 (7.5%)
"Palha" cigarettes (cottage-industry rolled, in corn husk)	12 (7.5%)
Other (e.g., chewing tobacco, snuff, Bidis, pipes, cigars)	5 (3.1%)
Rules about smoking in the home	
Smoking is allowed in home	73 (45.6%)
Smoking is not allowed in home, with exceptions	10 (6.3%)
Smoking is not allowed in home	71 (44.4%)
Have no rule	6 (3.8%)
At least one other smoker lives in patients' home	157 (98.1%)
Exposure to health professionals/advice to quit	
Not counting today, in the past 12 months…	
Visited a health professional 3 or more times	144 (90%)
Was asked smoking status by a health professional	142 (88.8%)
Was advised to quit smoking by a health professional	139 (86.9%)
Interest/confidence in quitting	
0–10 interest in quitting smoking (0 = low; 10 = high) mean (SD)	8.77 (±2.69)
0–10 confidence in quitting (0 = low; 10 = high) mean (SD)	7.38 (±3.17)
Plans for quitting	
Planning to quit in the next month	56 (35%)
Planning to quit in the next 12 months	4 6 (28.8%)
Not interested in quitting smoking	35 (21.9%)
Other	23 (14.4%)
Quit attempts	
Longest quit attempt, during lifetime (in days) mean (SD)	234 (±1029)
Tried to quit at least one time in past 12 months	85 (53.1%)
If so, longest quit attempt (in days) median (IQR) (N = 80)	8 (49)
Received any assistance to quit in the past 12 months	90 (56%)
Types of assistance received:	
Counseling from a health professional	38 (23.8%)
Clinic with sessions for quitting smoking	15 (9.4%)
Cessation medication (patch, gum, or lozenge)	22 (13.8%)
Prescription cessation medications	10 (6.3%)
Introduction to Quitting program at CHDM-JF	58 (36.3%)
Other (telephone, homeopathy, acupuncture, herbs)	11 (6.88%)
Interest in tobacco treatment[e]	
Interested in receiving treatment through CHDM-JF	104 (65%)
0–10 interest in using medication to quit (0 = low; 10 = high) mean (SD)	7.38 (±3.17)
Eligibility for cessation medication	
Smokes 20 or more cigarettes per day	52 (32.5%)
Smokes first cigarette within 30 min of waking *and* smokes at least 10 cigarettes per day	98 (61.25%)
FTND score ≥5	77 (48.12%)
Tried to quit using the public cognitive-behavioral program	15 (9.4%)
Total meeting criteria[f]	124 (77.5%)

[a] No. (%) unless otherwise noted.
[b] AUDIT-C cutoff ≥5.
[c] No. (%) unless otherwise noted.
[d] N = 160 unless otherwise noted.
[e] This excludes one criterion, *the patient does not have clinical contraindications*, which we were not able to assess during our survey. In addition, guidelines permit treatment professionals to deem patients eligible based on clinical judgment.
[f] Patients must meet 1 or more criteria to be considered eligible.

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in the home. Although 87% had been advised to quit by a health professional in the past year, only half (56%) had been given any assistance to quit. Notably, only 6.3% received any medication in the past year. Patients with one chronic disease were significantly more interested in receiving tobacco treatment through CHDM-JF (73.8%) compared to those with two (61.2%), or three chronic illnesses (50%) ($p = 0.048$).

Most (65%) were interested in receiving treatment for tobacco dependence at CHDM-JF; interest was higher among those with 1 chronic illness (73.8%) compared to those with 2 (61.2%) or 3 (50%) ($p = 0.048$). Most (77.5%) participants met at least one criterion for receiving cessation medication (Table 1).

This study found that one in ten patients being treated for chronic diseases smoked cigarettes. These patients were light but daily smokers and lived with another smoker in the home. Although most had been advised to quit, very few received evidence-based tobacco treatment—consisting of counseling and medication. Interest in receiving treatment via the chronic disease clinic was lower for sicker patients—those with multiple chronic illnesses.

The Brazilian context of this study is in some ways different but also similar to conditions in other countries. Brazilian treatment guidelines are evidence-based and accord with those in the U.S. and many other countries. These guidelines include identifying smokers; assessing readiness to quit; providing counseling and medication to those who are ready to quit; and scheduling follow-up [14]. Unlike the U.S., but similar to other countries, Brazil has a national strategy and public funding for provider training and the provision of counseling and medications [15]. Hence, the generalizability of these data must be weighed by each country's smoking and treatment context and the clinic sample.

For example, the prevalence of smoking in this clinic population was approximately half of the Brazilian general population, which was 17.1% in 2008 [16,17]. However, Clair and colleagues found that tobacco use among U.S. diabetics, drawn from a nationally representative sample, was no different from the general population [6]. Interestingly, both studies found that depression was prevalent among smokers with diabetes in both countries.

Strengths of this study include the high response rate, use of standardized international survey items, and rigorous methods for RA training and data entry. Limitations include the brief data collection instrument, which facilitated data collection but reduced the depth of measures, and collecting data in only one clinic site, which limits generalizability within and outside of Brazil.

These data suggest that much can be done to close the gap between simply advising patients with chronic diseases to quit—and actually helping them to do so. Tobacco dependence should be redefined as a co-occurring and highly treatable chronic disease [18–20], equal in importance to patients' other chronic conditions. Couples treatment could be offered to patients that live with other smokers. Chronic disease care providers should employ systems that ensure routine, evidence-based tobacco treatment and address comorbidities such as co-occurring depression and alcohol use.

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