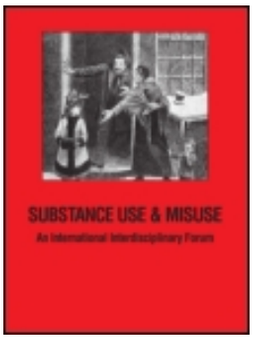

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ORIGINAL ARTICLE

Religiosity and Tobacco and Alcohol Use in a Brazilian Shantytown

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This article analyzes the role of religious involvement and religious beliefs in the prevalence and frequency of smoking and alcohol consumption. This was a cross-sectional, population-based study. In 2005, we conducted door-to-door interviews with 383 people, aged 18 years or more, randomly selected from the "Paraisopolis" shantytown in São Paulo, Brazil. Four regression models were created to explain the relationships among religious involvement, tobacco and alcohol use, controlling for demographic, social, and psychobehavioral factors. High religious attendance was associated with less alcohol use, alcohol abuse, tobacco use, and combined alcohol/tobacco use, as well as less days consuming alcoholic beverages per week, controlling for confounding factors. Additionally, high nonorganizational religious behavior was associated with less tobacco and combined alcohol/tobacco use. Religiosity plays an important role in the control of alcohol and tobacco use in a shantytown setting; further management initiatives in the area should consider this issue. The study's limitations are noted.

Keywords alcohol, behavioral, smoking, faith based, religiosity, religion, shantytown, spirituality

INTRODUCTION

Drugs use is a worldwide public health problem. According to World Health Organization's World Mental Health Survey Initiative, which evaluated 17 countries worldwide, lifetime use of drugs ranges from 46% to 97% for alcohol, from 16.8% to 73.6% for tobacco, from 0.3% to 42.4% for cannabis, and from 0% to 16.2% for cocaine (Degenhardt et al., 2008). They found that the use of drugs is not related to drug policy, since countries with stringent drug-related policies did not have lower levels of use than those with liberal ones.

Age, gender, education, income, parental drug-use-related problems/monitoring, mood disorders, and personality disorders are the most common risk factors[1] for any type of drug usage (Benjet et al., 2007; Compton, Thomas, Stinson, & Grant, 2007; Degenhardt et al., 2008). Nevertheless, many studies show the protective role[2] of religiosity/spirituality in this kind of behavior, in which higher organizational religiosity, nonorganizational religiosity, and some religious affiliations are associated with less use of alcohol, tobacco, and illicit drugs (Edlund et al., 2010; Michalak, Trocki, & Bond, 2007; Yeung, Chan, & Lee, 2009). Furthermore, addiction treatment groups such as Alcoholics Anonymous have developed in and out of faith-based settings and emphasize personal searching, prayer, meditation, and conscious contact with God (higher power as one understands it to be) (Steigerwald & Stone, 1999), considering spirituality as an important step in recovery.

Although several studies have been conducted in community and general population groups, those regarding the relationship between religious involvement and use of drugs in shantytowns are unreported in the literature.

[1]The reader is reminded that the concepts of "risk factors," as well as "protective factors," are often noted in the literature, without adequately noting their dimensions (linear, nonlinear; rates of development; anchoring or integration, cessation, etc.), their "demands," the critical necessary conditions (endogenously as well as exogenously; from a micro to a macro level), which are necessary for either of them to operate (begin, continue, become anchored and integrate, change as de facto realities change, cease, etc.) or not to, and whether their underpinnings are theory-driven, empirically based, individual and/or systemic stakeholder-bound, based upon "principles of faith," historical observation, precedents and traditions that accumulate over time, perceptual and judgmental constraints, "transient public opinion," or what. This is necessary to consider and to clarify if these terms are not to remain as yet additional shibboleth in a field of many stereotypes, tradition-driven activities, "principles of faith," and stakeholder objectives. Editor's note.

[2]The journal's style utilizes the category *substance abuse* as a diagnostic category. Substances are used or misused; living organisms are and can be *abused.* Editor's note.

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If we consider that shantytown inhabitants are posited to be more prone to using drugs due to the low socioeconomic status and the easier access to drugs (Zaluar, 2001), it would be important to investigate if religiousness and spirituality could have any "protective effect." This relation could even help developing countries to establish antidrug use programs in very low-income communities.

We aim with the following study to analyze the role of different kinds of religious involvement (organizational, nonorganizational, intrinsic) and religious beliefs (life after death and reincarnation) in the prevalence and frequency of smoking and alcohol consumption, as well as the variables that may confound this relationship.

METHODS

In this observational, cross-sectional study, we conducted door-to-door interviews with 439 subjects aged 18 years or more living in a Brazilian shantytown named "Paraisópolis" community located in the city of São Paulo, Brazil.

This informal settlement has approximately 60,000 inhabitants (Torres, Braga, Taddei, & Nobrega, 2006) and 11,223 houses, which occupies 85 hectares in the Morumbi district (Southwest São Paulo, Brazil). According to a recent publication, at least 52% have an annual income of less than 3 BMW (Brazilian minimum wage, approximately US$ 305.00) and 24% have an annual income of less than 1 BMW (da Silva & Ribeiro, 2006). The name Paraisopolis means "Paradise City" in Portuguese.

According to a recent survey (Almeida & D'andrea, 2004), there is a predominance of Evangelical Protestant churches in Paraisópolis shantytown. For instance, there are eight churches from "Assembléia de Deus," seven from "Deus é Amor," four from "Igreja Presbiteriana," and seven from other Evangelical Protestants denominations. Catholics, however, were represented by only one church.

Although somewhat confusing, most "Paraisopolis" residents (70%–75%) still have a Roman Catholic denomination. However, Catholics have a lower frequency of religious attendance compared with Evangelical Protestants.

According to de Almeida (Almeida & D'andrea, 2004), 70% of Evangelical Protestants in "Paraisopolis" reported attending to religious services at least once a week. The social interaction at these meetings often results in increased friends and strong relationships that are available for support when needed.

In "Paraisopolis," the Evangelical Protestants focus on personal growth and friendships, which lead to an increase in well-being and trust. In Evangelical churches, there is mutual help involving food distribution, access to information, information about jobs, and financial help, among others (Almeida & D'andrea, 2004).

There are also some social programs conducted by other religious denominations. The Catholic congregation offers educational programs (educational scholarships in private schools), professional training programs, and day care centers. In addition, Spiritists often volunteer in social projects throughout the community.

PROCEDURES

The original data were gathered as part of a study examining headache prevalence and "risk factors" in very low-income communities (Lucchetti & Peres, 2011).

We randomly selected households according to the sectors included in the Albert Einstein Family Health Program number 2. This program had 34 family health agents and approximately 3,400 households included (100 per agent). Then, 10 agents and 45 households for each agent were randomly selected, expecting 450 households. Eleven households were not evaluated by the agents, remaining 439 for final analysis.

The interview was carried out by trained personnel from the Family Health Program, who were called community health agents (CHAs). CHAs are key people within the nationwide community health agent program (CHAP), created in 1991, that operates within Brazil's Family Health Strategy (FHS). CHAs work directly with residents to identify health problems, provide health information, and refer residents to health professionals on the local FHS team. They follow up with clients to ensure successful treatment and to protect, promote, and restore their general health (Zanchetta et al., 2009).

CHAs act as informal health educators in poor, socially marginalized areas, where residents feel that they are disempowered and lack rights. CHAs provide leadership, education about rights, and facilitate communities' and citizens' empowerment (Zanchetta et al., 2009). The CHA interviewers usually have a good relationship with the community residents and have full access to patients' homes.

Training was carried out by a group of supervisors during a 4-day workshop. These workshops included presentation of information to the interviewers about research methods and substance use terminology; familiarization with aspects of survey research (including the importance of precision in collecting data); technique for the selection of households and individuals to be interviewed; and instruction on the design of the questionnaire and the relevant skip patterns within it. This model was adapted from a previous study (Jutkovitz, 1992).

The interviewers presented the study objectives to the household resident and, if eligible, he/she was invited to participate. After agreeing, the participant signed a written informed consent. Eligible respondents were aged 18 years or more, a permanent resident of the household, and mentally capable of answering the questions.

The questionnaire included questions about sociodemographic characteristics, as well as questions about headache (based on the Second Edition of the International Classification of Headache Disorders (ICHD-II), depression and anxiety [based on *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM IV) criteria; American Psychiatric Association, 1994],

alcohol use and abuse, tobacco use, and religious involvement/beliefs.

Current alcohol consumption was assessed by the following questions: "Did you use alcoholic beverages last month?" and "How many days do you usually drink alcohol beverages per week?" We defined nondrinkers as those who recorded zero for current consumption of any alcoholic beverage during the last month. Alcohol abuse was defined as the consumption of more than 14 drinks a week for men and more than 7 drinks a week for women (Barros & Nahas, 2001).

Current tobacco use was assessed by the following questions: "Did you smoke last month?" and "How many cigarettes do you usually smoke per day?" We defined nonsmokers as those who recorded zero for current use of any cigarettes in the last month.

Religiosity was analyzed using the Duke Religion Index (DUREL; Koenig, Parkerson, & Meador, 1997) validated by the present study into Portuguese (Lucchetti et al., 2010). The DUREL is a five-item measure of religious involvement, which yields three subscales: (1) organizational religious behavior (1 item), (2) nonorganizational religious behavior (1 item), and (3) intrinsic religious motivation. Response options are on a 5- or 6-point Likert scale. Responses to the items of the organizational and nonorganizational subscales are rated on a 6-point scale: 1 = never, 2 = once a year or less, 3 = a few times a year, 4 = a few times a month, 5 = once a week, and 6 = several times a week. Response options for the intrinsic subscale are on a 5-point scale ranging from 1 = definitely not true to 5 = definitely true. Items are reverse-scored and summed.

Religious beliefs were analyzed through the following additional questions: "Do you believe in life after death?" (yes/no) and "Do you believe in reincarnation?" (yes/no/no opinion).

Prevalence rates of tobacco and alcohol use/abuse were calculated. Student t-test and χ^2 analysis were used to compare continuous and dichotomous variables (Table 1).

Logistic regression (enter method) was conducted for the following dependent variables: smoking (yes/no), alcohol use (yes/no), alcohol abuse (yes/no), and both smoking and alcohol use (yes/no). Furthermore, linear regression was used to examine the following dependent variables: cigarettes smoking per day (absolute number) and alcohol consumption per week (days a week).

The independent variables analyzed were organizational religious behavior (religious attendance), nonorganizational religious behavior, intrinsic religious motivation, and religious beliefs (life after death and reincarnation).

All social, psychosocial, and other behavioral factors were treated as confounding variables rather than as mediators. Thus, four models were created to explain the relation among religious involvement and alcohol/tobacco use/abuse (see Table 2).

Goodness of fit was evaluated by the Hosmer–Lemeshow test and Omnibus Tests of Models Coefficients. Values of $p \leq .05$ defined statistical significance. Odds ratio (OR) was presented with 95% confidence intervals. All statistical analyses were performed with SPSS version 17.0 software (SPSS, Inc.).

The project of this study was approved by the Ethics Committee on Research of the Hospital Israelita Albert Einstein in São Paulo, Brazil.

RESULTS

Of the 439 households contacted, at least one member from 383 (87.2%) households participated. In the remaining 56 households, the survey was not completed because no one in the household was eligible or those who were eligible refused to participate.

Table 1 shows the distribution of the survey participants by sociodemographic characteristics and use of alcohol and tobacco. Participants were more likely to be women (74.4%) and more likely to be aged 18–39 years [mean age was 41.7 (SD = 8.5) years]. Almost half of the subjects reported an annual household income of less than 2 BMW, 51.2% were of mixed race, and approximately 30% were unemployed.

The following are social, environmental, and psychological aspects of this population: (a) environmental: 91% of residents have a brick house, 73% have access to a treated water supply, and 72% have a sanitary sewer (18% have an open sewer and 10% a cesspit); (b) social: there are on average 4.3 residents per house, and 40 (10.4%) have private health insurance; and (c) psychological: anxiety disorder is present in 37% of participants and depressive symptoms in 63%. Concerning sleep patterns, 48% complain of morning tiredness, 66% have difficulties in maintaining sleep, 37% have difficulties in initiating sleep, and 33% indicate that it takes more than one hour to initiate sleep.

Concerning religiousness, 35.5% reported they attended religious services at least once a week, 58.2% were engaged in private religious activity at least daily, and the majority scored high on intrinsic religiosity. Roman Catholic was the most common religious affiliation (72.6%), followed by Evangelical Protestants (13.3%).

More than 20% reported tobacco use, 17.5% alcohol use, and 7.8% alcohol abuse. Smoking was more prevalent in Blacks, whereas alcohol use was more prevalent among men and less prevalent among housewives. Other types of beliefs such as reincarnation and life after death were not related to current smoking and/or use of alcohol.

Table 2 (logistic regression models) shows that high religious attendance was associated with less alcohol use, alcohol abuse, tobacco use, and combined alcohol/tobacco use, even after controlling for demographic, social, and behavioral variables. Furthermore, high nonorganizational religious behavior was associated with less tobacco use and less combined alcohol/tobacco use. Evangelical Protestants used less alcohol than Catholics and those without religious affiliation. Intrinsic religiosity or religious beliefs were surprisingly unrelated to tobacco or alcohol use.

TABLE 1. Distribution of the respondents, by some sociodemographic characteristics ($n = 383$)

	Total		Tobacco and alcohol use	
			Smoking (%)	Alcohol use (%)
Sociodemographic characteristic	*n*	%	$n = 79$ (20.6%)	$n = 67$ (17.5%)
Gender				
Male	98	25.6	21.9	35.4***
Female	285	74.4	21.1	12.0
Age (years)				
18–40	222	57.9	22.3	19.5
41–60	130	34.0	17.8	17.0
>60	31	8.1	8.7	9.5
Race				
White	143	37.3	15.8	19.4
Black	43	11.2	29.3*	17.1
Mixed	196	51.2	23.7	16.8
Indian	1	0.3	0.0	0.0
Education level (years of school)				
Illiterate	39	10.2	27.0	16.2
Less than 4 years	118	30.8	22.6	13.9
5–8	118	30.8	24.3	21.7
8–11	104	27.2	14.0	20.0
>11	4	1.0	25.0	0.0
Marital status				
Single	133	34.7	21.9	21.9
Married or cohabitating	217	56.7	21.2	17.0
Divorced	24	6.3	18.2	9.1
Widowed	9	2.3	22.2	11.1
Household income (BMW)				
≤1	47	12.7	28.9	11.1
1.1–2	127	34.2	20.7	14.9
2.1–4	166	44.7	20.4	19.8
4.1–6	19	5.1	5.3	36.8*
>6	12	3.2	3.3	16.7
Job status				
Working	127	33.2	25.6	23.2
Unemployed	114	29.8	23.9	17.4
Housewife	74	19.3	13.9	9.7*
Other	68	17.7	16.9	18.5
Religious affiliation				
Catholic	278	72.6%	24.4	21.4
Evangelical Protestants	51	13.3%	6.0	2.0*
No religious affiliation	34	8.9%	24.2	21.2
Spiritists	2	0.5%	0.0	0.0
Others	18	4.7%	15.0	0.5
Religious attendance				
Never	35	9.1%	34.3	28.6
Once a year or less	62	16.2%	32.2	23.7
A few times a year	73	19.1%	27.8	27.8
A few times a month	77	20.1%	22.7	14.7
Once a week	69	18.0%	13.4**	10.4*
More than once a week	67	17.5%	3.2***	7.9***
Private religious activity				
Rarely or never	55	14.4%	37.7*	30.2*
A few times a month	32	8.4%	28.1	21.9
Once a week	22	5.7%	9.5	23.8
Two or more times/week	51	13.3%	16.0	16.0
Daily	198	51.7%	18.4	13.7
More than once a day	25	6.5%	20.0	20.0

(Continued on next page)

TABLE 1. Distribution of the respondents, by some sociodemographic characteristics ($n = 383$) *(Continued)*

	Total		Tobacco and alcohol use	
			Smoking (%)	Alcohol use (%)
Sociodemographic characteristic	*n*	%	$n = 79$ (20.6%)	$n = 67$ (17.5%)
Intrinsic religiousness (DUREL)				
3–10	57	14.9	26.8	28.6
11–14	99	25.8	23.5	16.3
15	227	59.3	13.4**	21.7
Do you believe in life after death?				
Yes	164	44.2	20.1	16.5
No	207	55.8	22.2	19.3
Do you believe in reincarnation?				
Yes	109	29.4	22.0	15.6
No	222	59.8	19.4	18.0
No opinion	40	10.8	30.0	25.0

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 3 (linear regression models) shows that less religious attendance was related to fewer days per week consuming alcoholic beverages, but not to frequency of cigarette smoking. Other measures (intrinsic religiosity and religious beliefs) were not related to frequency of alcohol consumption or frequency of smoking.

DISCUSSION

In the present study, organizational religiosity was strongly associated with less smoking and alcohol consumption. These results are in line with many previous studies in which higher religious attendance was related to less use of licit and illicit drugs (Blay, Batista, Andreoli, & Gastal, 2008; Edlund et al., 2010; Koenig, George, Meador, Blazer, & Ford, 1994; Yeung et al., 2009).

Recently, a meta-analysis evaluated 22 studies from 1995 to 2007 and found that religiosity was consistently associated with less youth substance use, including alcohol, cigarette, marijuana, and other illicit drugs (Yeung et al., 2009). This association was maintained in other groups such as adults (Koenig et al., 1994) and the elderly (Blay et al., 2008).

Not only was there a lower prevalence of licit drugs use in those who attended religious services more frequently, but alcohol consumption was also lower in this group. This relationship in our study was also present for both prevalence and quantity of alcohol use.

Many explanations for this relationship are possible. Some authors believe that social support may play an important role, but this alone is probably not the only reason. A 2010 study examined the role of social and mental health status in mediating the relationship between religiosity and substance use. Authors evaluated religious attendance and importance of religion, finding that social support and mental health status variables had little effect on the magnitude of the religiosity coefficients in the logistic regression models (Edlund et al., 2010). These findings are similar to the present study. Controlling for demographic, social, and behavioral aspects and other drugs used, the results for organizational religiosity were the same. Social support also did not explain the role of nonorganizational religiosity in smoking and combined use of both tobacco and alcohol.

Other possible explanations may involve the enhancement and cultivation of moral values by religion. Cole et al. (2007) found that some traditional (conformity, tradition, security) and humanitarian (benevolence, universalism/equality) values were associated with lower substance use in school children. Furthermore, Dollinger and Kobayashi (2003) evaluated alcohol use among college students and found alcohol consumption negatively correlated with humanistic (universalism and benevolence) values. Most religions encourage moral values in their doctrines.

There are also differences in alcohol use/abuse between religious traditions, just as we found. For instance, Roman Catholics utilize it in their sacraments and Afro-religions (i.e., Umbanda) utilize it in their rituals, whereas some Brazilian Protestant Evangelicals forbid its use. These findings are in line with a previous Brazilian study that showed a lower prevalence of alcohol use among Evangelical Protestants (Soeiro et al., 2008). There is a difference, however, between the use of sacramental substances (consuming the substance only for religious purposes) and the use of substances for recreational purposes, which can have repercussions on substance use and abuse.

Some authors also hypothesize that religious group support could buffer life stress and also enhance the participation in nondrinking activities that are church related (Galen & Rogers, 2004).

Nevertheless, the exact mechanism for this relationship is still not completely understood. Some genetics studies have been contributory. Recently, a study conducted by Button, Hewitt, Rhee, Corley, and Stallings (2010) evaluated the genetic variance moderation of alcohol use in adolescence and early adulthood. They found that religiosity appeared to moderate the genetic effects on

TABLE 2. Effect of religiosity measures on current tobacco and alcohol use, controlling for demographic, social, and behavioral factors and other drugs use (logistic regression models)

	Total smoking and alcohol use	Smoking	Alcohol use	Alcohol abuse
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Unadjusted				
Religious attendance				
Once a week or more	0.243 (0.139–0.425)***	0.240 (0.119–0.481)***	0.405 (0.203–0.808)**	0.639 (0.490–0.833)**
Less than once a week	1.00	1.00	1.00	1.00
Nonorganizational religious behavior				
Daily or more	0.829 (0.723–0.951)**	0.811 (0.698–0.943)**	0.812 (0.693–0.952)*	0.747 (0.600–0.930)**
Less than once a day	1.00	1.00	1.00	1.00
Intrinsic religious motivation				
14–15	0.934 (0.867–1.007)	0.953 (0.877–1.034)	0.902 (0.830–0.980)*	0.926 (0.825–1.039)
Less than 14	1.00	1.00	1.00	1.00
Model 1 (demographic)				
Religious attendance				
Once a week or more	0.243 (0.137–0.431)***	0.219 (0.109–0.440)***	0.364 (0.181–0.730)**	0.681 (0.520–0.893)**
Less than once a week	1.00	1.00	1.00	1.00
Nonorganizational religious behavior				
Daily or more	0.841 (0.725–0.977)*	0.789 (0.666–0.934)**	0.866 (0.725–1.033)	0.787 (0.618–1.0000)*
Less than once a day	1.00	1.00	1.00	1.00
Intrinsic religious motivation				
14–15	0.947 (0.869–1.031)	0.934 (0.849–1.028)	0.955 (0.865–1.054)	0.953 (0.831–1.093)
Less than 14	1.00	1.00	1.00	1.00
Model 2 (Sociodemographic)				
Religious attendance				
Once a week or more	0.240 (0.134–0.428)***	0.209 (0.102–0.427)***	0.372 (0.185–0.749)**	0.684 (0.520–0.900)**
Less than once a week	1.00	1.00	1.00	1.00
Nonorganizational religious behavior				
Daily or more	0.852 (0.733–0.991)*	0.812 (0.684–0.964)*	0.864 (0.721–1.036)	0.793 (0.620–1.013)
Less than once a day	1.00	1.00	1.00	1.00
Intrinsic religious motivation				
14–15	0.946 (0.868–1.020)	0.932 (0.847–1.027)	0.949 (0.859–1.048)	0.950 (0.829–1.089)
Less than 14	1.00	1.00	1.00	1.00
Model 3 (Sociodemographic and behavioral aspects)				
Religious attendance				
Once a week or more	0.205 (0.111–0.378)***	0.170 (0.079–0.365)***	0.322 (0.151–0.688)**	0.681 (0.515–0.900)**
Less than once a week	1.00	1.00	1.00	1.00
Nonorganizational religious behavior				
Daily or more	0.832 (0.711–0.973)*	0.783 (0.656–0.935)**	0.832 (0.688–1.006)	0.780 (0.607–1.001)
Less than once a day	1.00	1.00	1.00	1.00
Intrinsic religious motivation				
14–15	0.930 (0.850–1.016)	0.909 (0.823–1.005)	0.932 (0.840–1.034)	0.947 (0.825–1.086)
Less than 14	1.00	1.00	1.00	1.00
Model 4 (drugs use)				
Religious attendance				
Once a week or more	–	0.185 (0.083–0.413)***	0.400 (0.203–0.789)**	0.740 (0.540–0.997)*
Less than once a week		1.00	1.00	1.00
Nonorganizational religious behavior				
Daily or more	–	0.810 (0.670–0.979)*	0.901 (0.735–1.105)	0.821 (0.633–1.065)
Less than once a day		1.00	1.00	1.00
Intrinsic religious motivation				
14–15	–	0.918 (0.823–1.024)	0.969 (0.870–1.078)	0.986 (0.855–1.137)
Less than 14		1.00	1.00	1.00

Notes: Model 1: Demographic variables: income, age, sex, education, job status, marital status, and race.
Model 2: Demographic and social variables: income, age, sex, education, job status, marital status, race, number of persons living in the house, water supply, and type of house.
Model 3: Demographic, social, and behavioral aspects: income, age, sex, education, job status, marital status, race, number of persons living in the house, water supply, type of house, physical activity, depression, anxiety, and sleep patterns (initiating sleep and diurnal somnolence).
Model 4: drugs use (alcohol, smoking, and illicit drug use).
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

TABLE 3. Effect of religiosity measures on frequency of alcohol and tobacco use, controlling for demographic, social, behavioral and other drugs use (Linear Regression Models).

	Cigarettes/day Beta (SE)	Alcohol consumption/week Beta (SE)
Unadjusted		
Religious attendance	−1.103 (0.901)	−0.090 (0.028)***
Nonorganizational religious behavior	0.068 (1.250)	−0.082 (0.028)**
Intrinsic religious motivation	0.281 (0.711)	−0.038 (0.015)*
Model 1 (demographic)		
Religious Attendance	−0.459 (0.926)	−0.063 (0.027)*
Nonorganizational religious behavior	1.229 (1.257)	−0.049 (0.028)
Intrinsic religious motivation	0.731 (0.726)	−0.012 (0.016)
Model 2 (Socio-demographic)		
Religious Attendance	−0.619 (0.962)	−0.060 (0.027)*
Nonorganizational religious behavior	1.330 (1.296)	−0.046 (0.028)
Intrinsic religious motivation	0.692 (0.760)	−0.013 (0.016)
Model 3 (Socio-demographic and behavioral aspects)		
Religious Attendance	−0.848 (0.967)	−0.066 (0.027)*
Nonorganizational religious behavior	1.197 (1.500)	−0.058 (0.028)*
Intrinsic religious motivation	0.604 (0.820)	−0.017 (0.016)
Model 4 (drugs use)		
Religious attendance	−1.174 (1.001)	−0.036 (0.027)*
Nonorganizational religious behavior	1.367 (1.510)	−0.039 (0.028)
Intrinsic religious motivation	0.616 (0.821)	−0.009 (0.016)

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Model 1: Demographic variables: income, age, sex, education, job status, marital status, race

Model 2: Demographic and Social variables: income, age, sex, education, job status, marital status, race, number of persons living in the house, water supply, type of house

Model 3: Demographic, Social and Behavioral aspects: income, age, sex, education, job status, marital status, race, number of persons living in the house, water supply, type of house, physical activity, depression, anxiety, sleep patterns (initiating sleep and diurnal somnolence)

Model 4: drugs use (alcohol, smoking and illicit drug use)

SE: Standard Error

problem alcohol use during adolescence, but not during early adulthood. In other words, religiosity may attenuate the heritability of alcohol-use-related problems more in adolescence. Another study compared female twins and found that low levels of religiosity were associated with earlier smoking initiation (Kendler et al., 1999). Further studies are needed to clarify these findings.

Concerning nonorganizational religiosity (prayer, meditation, or Bible study), we found that those with higher levels had a lower prevalence of tobacco use. This relationship may be explained by the reduced smoking due to religious practices such as prayer (Ferguson, Willemsen, & Castañeto, 2010) or meditation (Oman, Shapiro, Thoresen, Plante, & Flinders, 2008) that may fulfill the need that smoking does. According to some authors, stress levels are inversely associated with smoking (Childs & de Wit, 2010).

Intrinsic religiousness was also evaluated by the present study, but no relationship was found in tobacco or alcohol use. Surprisingly, this result was different compared with previous research (Patock-Peckham, Hutchinson, Cheong, & Nagoshi, 1998; Storch, Storch, Kovacs, Okun, & Welsh, 2003). One would expect lower levels of substance use in persons with higher levels of intrinsic religiosity. Probably, in this kind of population (very low income), religious service attendance is more important than intrinsic religiosity due to the support, warmth, and sharing of experiences and life stressors. Furthermore, the moral values leaned with other religious members could lead to these findings. Another explanation could be difficulty understanding the statements on intrinsic religiosity as presented by the DUREL. This low-education and low-income population had more trouble filling out this subscale due to complex statements and "Likert format" responses.

Other types of beliefs such as reincarnation and life after death have been rarely addressed in previous studies regarding religiosity and health, although these beliefs have been associated with better health in the few studies that have examined this, which differs from our findings. In 2002, Krause et al. evaluated the elderly in Japan and found that those who believed in a good afterlife were less likely to report hypertension at follow-up. Additionally, Flannelly et al. evaluated the association between belief in life after death and psychiatric symptomatology among 1,403 adult Americans. An inverse relationship between belief in life after death and symptom severity was found with the following psychiatric symptoms: anxiety, depression, obsession-compulsion, paranoia, phobia, and somatization (Flannelly, Koenig, Ellison, Galek, & Krause, 2006). In our setting, these beliefs were not related to current use of alcohol or tobacco.

Study's Limitations

This study has several limitations. First, the data are cross sectional, not allowing us to say anything about whether the relationship is a causal one. Second, we evaluated only one Brazilian shantytown and these findings may not be generalizable to other settings. Third, the alcohol use may be a causal factor[3] in decreasing religiosity and church attendance. Fourth, we did not evaluate all social, behavioral, and demographic variables, some of which may confound or mediate these relationships. Some important social support issues such as number of friends, relatives, and those to share personal issues were not assessed.

Despite the possible "protective effects" of religiosity regarding substance use, this is a complex, dynamic, and multidimensional relationship. Addiction is influenced by several distinct factors, including (a) macro level (economic opportunity, educational opportunity, and popular culture; Anderson, 1998; Pacula & Chaloupka, 2001), (b) meso level (social marginalization and identification with a drug subcultural group), (c) micro level (personal marginalization, ego identity discomfort, and lost control in defining an identity; Anderson, 1998), (d) endogenous variables (an emotion or behavior that is spontaneously generated from the substance user's internal state), and (e) exogenous variables (caused by external factors).

CONCLUSIONS

This study also has several strengths. Little research has been done to understand the role of social, behavioral, and spiritual issues in shantytowns. In such a poverty condition, the search for anything that brings hope and ways to cope with reality must be considered important. If religiosity can help in difficult situations, this surely deserves further study.

These findings may also be relevant to developing countries as they develop antidrug use programs in shantytowns, utilizing the resources available within faith-based community organizations.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

RÉSUMÉ

Religiosité, usage de tabac et d'alcool dans une favela brésilienne

Cet article a pour objectif d'analyser le rôle de l'engagement religieux et des croyances religieuses dans la prévalence et dans la fréquence des consommations de tabac et d'alcool. Il s'agit d'un étude transversale faite à partir de la population. En 2005, nous avons réalisé 383 interviews en porte à porte, sur des sujets âgés de plus de 18 ans, choisis au hasard dans la favela de Paraisopolis à São Paulo au Brésil. Quatre modèles de régression ont été créés pour expliquer les relations entre l'engagement religieux et l'usage de tabac et d'alcool, en prenant en compte les facteurs démographique, social, et psycho-comportemental. Une religiosité élevée a été reliée à moins d'alcool, d'abus d'alcool, d'usage de tabac, moins d'usage associé alcool/tabac et moins de journées de consommations de produits alcoolisés par semaine, le tout en contrôlant les facteurs confondants. De plus, un comportement religieux hautement non-organisé a été associé à moins de tabac et d'alcool/tabac. La religiosité joue un rôle important dans le contrôle de la consommation d'alcool et de tabac dans le cadre d'une favela, des initiatives de management plus poussées dans ce domaine devraient considérer cette question.

RESUMEN

Religiosidad, uso de alcohol y tabaquismo en una favela brasilera

El objetivo con el presente estudio es analizar el papel del envolvimiento religioso y de las creencias religiosas en la prevalencia y frecuencia del tabaquismo y consumo de alcohol. Fue realizado un estudio poblacional de carácter transversal en el año 2005. Fueron realizadas entrevistas domiciliarias en 383 personas, mayores de 18 años, seleccionadas randomicamente de la favela de Paraisópolis, localizada en Sao Paulo, Brasil. Fueron creados cuatro modelos de regresión para explicar las relaciones entre el envolvimiento religioso, tabaquismo y uso de alcohol, controlándose para variables demográficas, sociales y factores psico-comportamentales. Mayor frecuencia religiosa fue asociada a menor uso de alcohol, abuso de alcohol, tabaquismo y uso combinado de alcohol y tabaco, así como, menos días de consumo de alcohol, asimismo después del control de factores confundidores. De la misma forma, mayor religiosidad no organizacional fue asociada a menos tabaquismo y uso combinado de alcohol y tabaco. La religiosidad parece poseer un papel importante en el control del uso del alcohol y tabaco en las favelas. Nuevas iniciativas de gestión en esos lugares deben considerar ese aspecto."

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[3]The reader is referred to Hills's criteria for which were developed in order to help assist researchers and clinicians determine if posited *risk factors* were causes of a particular disease or outcomes or merely associated (Hill, 1965). Editor's note.

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GLOSSARY

Religiosity: extension to which an individual believes and practices a religion.

Organizational religiosity: church or temple attendance.

Nonorganizational religiosity: to pray, to read books, or to watch religious programs on television.

Intrinsic religiosity:: religion as the organizing principle of life, a central and personal experience.

REFERENCES

Almeida, R., & D'andrea, T. (2004). Pobreza e redes sociais em uma favela paulistana. *Novos Estudos CEBRAP, 68*, 94–106.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders. Arlington, VA: Author

Anderson, T. L. (1998). A cultural-identity theory of drug abuse. *The Sociology of Crime, Law, and Deviance, 1*, 233–262.

Barros, M. V., & Nahas, M. V. (2001). Health risk behaviors, health status self-assessment and stress perception among industrial workers. *Revista De Saude Publica, 35*(6), 554–563.

Benjet, C., Borges, G., Medina-Mora, M. E., Fleiz, C., Blanco, J., Zambrano, J., et al. (2007). Prevalence and socio-demographic correlates of drug use among adolescents: Results from the Mexican Adolescent Mental Health Survey. *Addiction, 102*(8), 1261–1268.

Blay, S. L., Batista, A. D., Andreoli, S. B., & Gastal, F. L. (2008). The relationship between religiosity and tobacco, alcohol use, and depression in an elderly community population. *American Journal of Geriatric Psychiatry, 16*(11), 934–943.

Button, T. M., Hewitt, J. K., Rhee, S. H., Corley, R. P., & Stallings, M. C. (2010). The moderating effect of religiosity on the genetic variance of problem alcohol use. *Alcoholism—Clinical and Experimental Research, 34*(9), 1619–1624.

Childs, E., & de Wit, H. (2010). Effects of acute psychosocial stress on cigarette craving and smoking. *Nicotine and Tobacco Research, 12*(4), 449–453.

Cole, M., Stanton, B., Deveaux, L., Harris, C., Cottrell, L., Clemens, R., et al. (2007). Latent class analysis of risk behaviors among Bahamian young adolescents: Relationship between values prioritization and latent class. *Social Behavior and Personality: An International Journal, 35*(8), 1061–1076.

Compton, W. M., Thomas, Y. F., Stinson, F. S., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: Results from the national epidemiologic survey on alcohol and related conditions. *Archives of General Psychiatry, 64*(5), 566–576.

da Silva, E. N., & Ribeiro, H. (2006). Temperature modifications in shantytown environments and thermal discomfort. *Revista De Saude Publica, 40*(4), 663–670.

Degenhardt, L., Chiu, W. T., Sampson, N., Kessler, R. C., Anthony, J. C., Angermeyer, M., et al. (2008). Toward a global view of alcohol, tobacco, cannabis, and cocaine use: Findings from the WHO World Mental Health Surveys. *PLoS Medicine, 5*(7), e141.

Dollinger, S. J., & Kobayashi, R. (2003). Value correlates of collegiate alcohol abuse. *Psychological Reports, 93*(3 Pt. 1), 848–850.

Edlund, M. J., Harris, K. M., Koenig, H. G., Han, X., Sullivan, G., Mattox, R., et al. (2010). Religiosity and decreased risk of substance use disorders: Is the effect mediated by social support or mental health status? *Social Psychiatry and Psychiatric Epidemiology, 45*(8), 827–836.

Ferguson, J., Willemsen, E., & Castañeto, M. (2010). Centering prayer as a healing response to everyday stress: A psychological and spiritual process. *Pastoral Psychology, 59*(3), 305–329.

Flannelly, K. J., Koenig, H. G., Ellison, C. G., Galek, K., & Krause, N. (2006). Belief in life after death and mental health: Findings from a national survey. *Journal of Nervous and Mental Disease, 194*(7), 524–529.

Galen, L. W., & Rogers, W. M. (2004). Religiosity, alcohol expectancies, drinking motives and their interaction in the prediction of drinking among college students. *Journal of Studies on Alcohol, 65*(4), 469–476.

Hill, A. B. (1965). The environment and disease: Associations or causation? *Proceedings of the Royal Society of Medicine*, *58*, 295–300.

Jutkovitz, J. (1992). Survey on drug prevalence and attitudes in the Dominican Republic. *Narcotic Awareness and Education Project*. Retrieved February 2, 2011, from http://pdf.usaid.gov/pdf_docs/PNABZ298.pdf

Kendler, K. S., Neale, M. C., Sullivan, P., Corey, L. A., Gardner, C. O., & Prescott, C. A. (1999). A population-based twin study in women of smoking initiation and nicotine dependence. *Psychological Medicine, 29*(2), 299–308.

Koenig, H. G., George, L. K., Meador, K. G., Blazer, D. G., & Ford, S. M. (1994). Religious practices and alcoholism in a southern adult population. *Hospital and Community Psychiatry, 45*(3), 225–231.

Koenig, H. G., Parkerson, G. R., Jr., & Meador, K. G. (1997). Religion index for psychiatric research. *American Journal of Psychiatry, 154*(6), 885–886.

Krause, N., Liang, J., Shaw, B. A., Sugisawa, H., Kim, H. K., & Sugihara, Y. (2002). Religion, death of a loved one, and hypertension among older adults in Japan. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 57*(2), S96–S107.

Lucchetti, G., Granero Lucchetti, A. L., Peres, M. F., Leão, F. C., Moreira-Almeida, A., & Koenig, H. G. (2010). Validation of the Duke Religion Index: DUREL (Portuguese version). *Journal of Religion and Health*, 1–8.

Lucchetti, G., & Peres, M. F. P. (2011). The prevalence of migraine and probable migraine in a Brazilian Favela: Results of a community survey. *Headache: The Journal of Head and Face Pain, 51*(6), 971–979.

Michalak, L., Trocki, K., & Bond, J. (2007). Religion and alcohol in the U.S. National Alcohol Survey: How important is religion for abstention and drinking? *Drug and Alcohol Dependence, 87*(2–3), 268–280.

Oman, D., Shapiro, S. L., Thoresen, C. E., Plante, T. G., & Flinders, T. (2008). Meditation lowers stress and supports forgiveness among college students: A randomized controlled trial. *Journal of American College Health, 56*(5), 569–578.

Pacula, R. L., & Chaloupka, F. J. (2001). The effects of macro-level interventions on addictive behavior. *Substance Use and Misuse, 36*(13), 1901–1922.

Patock-Peckham, J. A., Hutchinson, G. T., Cheong, J., & Nagoshi, C. T. (1998). Effect of religion and religiosity on alcohol use in a college student sample. *Drug and Alcohol Dependence, 49*(2), 81–88.

Soeiro, R. E., Colombo, E. S., Ferreira, M. H., Guimaraes, P. S., Botega, N. J., & Dalgalarrondo, P. (2008). Religion and psychiatric disorders in patients admitted to a university general hospital. *Cadernos de Saude Publica, 24*(4), 793–799.

Steigerwald, F., & Stone, D. (1999). Cognitive restructuring and the 12-step program of alcoholics anonymous. *Journal of Substance Abuse Treatment, 16*(4), 321–327.

Storch, E., Storch, J., Kovacs, A., Okun, A., & Welsh, E. (2003). Intrinsic religiosity and substance use in intercollegiate athletes. *Journal of Sport and Exercise Psychology, 25*(2), 248–252.

Torres, M. A., Braga, J. A., Taddei, J. A., & Nobrega, F. J. (2006). Anemia in low-income exclusively breastfed infants. *Jornal de Pediatria (Rio de Janeiro), 82*(4), 284–287.

Yeung, J. W., Chan, Y. C., & Lee, B. L. (2009). Youth religiosity and substance use: A meta-analysis from 1995 to 2007. *Psychological Reports, 105*(1), 255–266.

Zaluar, A. (2001). Violence in Rio de Janeiro: Styles of leisure, drug use, and trafficking. *International Social Science Journal, 53*(3), 369–378.

Zanchetta, M. S., McCrae Vander Voet, S., Galhego-Garcia, W., Smolentzov, V. M. N., Talbot, Y., Riutort, M., et al. (2009). Effectiveness of community health agents' actions in situations of social vulnerability. *Health Education Research, 24*(2), 330–342.