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Religiosity and Impulsivity in Mental Health

Is There a Relationship?

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Abstract: Our aim is to evaluate the relationship between religiosity and impulsivity in patients with mental illness who had attempted suicide and in healthy individuals. This is a cross-sectional study that included 61 healthy individuals and 93 patients. The instruments used were a sociodemographic data questionnaire, the Mini International Neuropsychiatric Interview, the Barratt Impulsiveness Scale, and the Duke University Religion Index. The healthy individuals presented higher scores in the religiosity domains (organizational, $p = 0.028$; non-organizational, $p = 0.000$; intrinsic, $p = 0.000$). The patients presented higher scores in the impulsivity dimensions (attentional, $p = 0.000$; motor, $p = 0.000$; absence of planning, $p = 0.000$). In the patient group, intrinsic religiosity had a significant inverse relationship with total impulsivity ($p = 0.023$), attentional ($p = 0.010$), and absence of planning ($p = 0.007$), even after controlling for sociodemographic variables. Healthy individuals were more religious and less impulsive than patients. The relationship between religiosity, impulsiveness, and mental illness could be bidirectional; that is, just as mental illness might impair religious involvement, religiosity could diminish the expression of mental illness and impulsive behaviors.

Key Words: Religiosity, impulsivity, mental health

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In recent decades, researchers have become more interested in scientifically studying the relationships between religiosity and health outcomes (Moreira-Almeida et al., 2006). Despite some methodological controversy, most of the studies that have been conducted to date show that greater religious involvement is positively associated with indicators of psychological well-being and better health (Dein et al., 2012; Koenig et al., 2001). In fact, the level of religious involvement tends to be inversely related to depression, suicidal behavior, and drug misuse (Bonelli and Koenig, 2013; Ronneberg et al., 2014). Although a number of articles have shown a protective effect of religious involvement against mental illnesses, rarely have the potential mediators of this relationship been investigated (Moreira-Almeida et al., 2006). In this context, one possible mediator could be impulsivity.

Impulsivity is a complex phenotype characterized by a variety of cognitive and behavioral patterns that lead to immediate, medium-, and long-term dysfunctional consequences (von Diemen et al., 2007). Over the last few decades, many studies on impulsivity have highlighted the importance of this symptom in various mental disorders, such as

personality disorders, bipolar disorder, suicidal behavior, pathological gambling, and drug misuse (Ledgerwood and Petry, 2004; Saddichha and Schuetz, 2014; von Diemen et al., 2007). In this context, although some studies indicate that there is an inverse relationship between religious practices and impulsivity, this topic has not been completely investigated (Patock-Peckham et al., 1998; Pearson et al., 1986). Thus, our aim is to evaluate the relationship between religiosity and impulsivity in patients with mental illness who have attempted suicide and in healthy individuals.

SUBJECTS AND METHODS

The patients involved in this study were part of a continuous assessment project that studied individuals who had attempted suicide by means of substances and who had been admitted to an anti-poison information center (CIAVE, Salvador, Brazil) (Caribé et al., 2012). CIAVE is a public service emergency center located within a general hospital (Hospital Geral Roberto Santos) that admits patients who have attempted suicide by substance use. A suicide attempt (SA) was defined as the use of toxic substances, such as medications, or chemical products with the intention of causing one's own death. All patients were 18 years or older and had been admitted to the emergency room at CIAVE for SA between July 2009 and July 2010. The patients were interviewed at CIAVE within 15 days of clinical rehabilitation for SA and, on average, within 5 days after they had attempted suicide. This study only assessed individuals with mental health issues that had been diagnosed according to the Mini International Neuropsychiatric Interview (M.I.N.I.P.L.U.S.).

The control group consisted of the people who had accompanied these patients, their relatives, and unrelated individuals who were from the same community to prevent any bias associated with differences in sociodemographic data between the groups. The selection criteria were controls of the same age and gender as the patients under assessment who had neither a history of previous SA nor an Axis I mental disorder. The data were collected using the same instruments for both patients and controls.

The instruments used were (1) a clinical and sociodemographic questionnaire, (2) the M.I.N.I.P.L.U.S. for the diagnosis of Axis I psychiatric disorders (Amorim, 2000), and (3) the Duke University Religion Index (DUREL). The DUREL is a five-item self-report scale that assesses three domains of religiosity: organizational religiosity (OR), non-organizational religiosity (NOR), and intrinsic religiosity (IR). The OR domain is measured with one item and is defined as the frequency with which one attends formal religious services. The NOR domain is measured with one item and is defined as the amount of time spent in private religious activities, such as prayer or meditation. The IR domain is measured with three items and is conceptualized as the degree to which one has integrated religion into one's life (Lucchetti et al., 2012). The religiosity evaluation assessed the period beginning 1 year before the SA, and (4) The Barratt Impulsiveness Scale (BIS 11) assessed Attentional Impulsiveness (AI), Motor Impulsiveness (MI), Absence of Planning (AP), and Total Impulsivity (TI) (von Diemen et al., 2007). All instruments were validated in Brazilian Portuguese.

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TABLE 1. Sociodemographic and Clinical Characteristics of Participants

Variables	Patients (<i>n</i> = 93) <i>N</i> (%) Mean ± SD	Healthy (<i>n</i> = 61) <i>N</i> (%) Mean ± SD	<i>p</i> -Value
Age (yr)	34.4 (10.3)	33.6 (11.1)	0.165
Gender (% female)	50 (53.7%)	35 (57.4%)	0.659
Employment (% employed)	56 (60.2%)	40 (65.5%)	0.502
Has partner	46 (49.5%)	34 (55.7%)	0.446
Has children	34 (36.62%)	32 (52.5%)	0.051
Has religious affiliation	51 (54.8%)	35 (57.4%)	0.756
Impulsiveness			
Attentional	21.1 (4.35)	17.8 (3.93)	0.000
Motor	23.4 (6.87)	17.5 (5.14)	0.000
Planning	27.7 (5.93)	21.5 (4.45)	0.000
Total	72.3 (15.41)	56.2 (11.69)	0.000
Religiosity			
Organizational	3.01 (1.53)	3.59 (1.54)	0.028
Non-organizational	2.92 (1.63)	4.44 (1.55)	0.000
Intrinsic	7.27 (3.42)	12.6 (2.55)	0.000

This study was approved by the local Medical Review Ethics Committee and performed according to the ethical standards set in the 1964 Declaration of Helsinki. Additionally, all patients provided written informed consent before their inclusion in the study.

Statistical Analysis

Descriptive analysis was conducted on the scores in the religiosity (OR, NOR, IR) and impulsiveness domains (AI, MI, AP, TI) between the patients and the healthy controls. Simple frequencies and percentages of the categorical variables were obtained, as were measures of the central tendencies (mean values) and dispersions (standard deviations) of the numerical variables. To verify the possible differences in clinical and sociodemographic characteristics between the two groups, the chi-square test and Student's *t*-test were used. After this initial analysis, the variables that showed a potentially statistically significant difference ($p \leq 0.20$) between the groups were adjusted in the multivariate regression.

The goodness-of-fit model adjustment was verified by the R-squared and adjusted R-squared, and the significance level adopted for the regression analysis was 5% ($p \leq 0.05$). The coefficient (β) and confidence intervals of 95% (95% CI) were obtained by multivariate analysis using the linear regression model, adjusted for the probable confounding variables of age and having children ($p \leq 0.20$). This methodology enabled estimating the mean increases (or decreases) in the outcomes of a number of variables. The collected data were digitized using the Statistical Package for Social Sciences software (SPSS Win, version 16) and were analyzed in the statistical program Stata v. 12.0.

RESULTS

One hundred thirty-nine patients with SA were eligible to participate in the study during the period between July 2009 and July 2010. Twelve (8.6%) refused to participate, 17 (12.2%) left the hospital too soon to be evaluated, and 17 were excluded because they did not meet the criteria for a mental disorder, resulting in a total of 93 patients. In addition, during the course of the study, 11 patients died from suicide before they had been selected for the study. Among the healthy individuals, 124 were eligible to participate, 10 (8.0%) were excluded because of previous SA, and 53 (42.7%) were excluded because they had a mental disorder, giving a total of 61 healthy controls.

The healthy individuals presented higher scores in the religiosity domains compared with the patients: OR ($p = 0.028$); NOR ($p = 0.000$),

and IR ($p = 0.000$). The patients presented higher scores in the impulsivity domains compared with the healthy individuals' AI ($p = 0.000$), MI ($p = 0.000$), AP ($p = 0.000$), and TI ($p = 0.000$). The clinical and sociodemographic data are described in Table 1.

Among the patients, 57 (61.2%) had major depression (MD), 20 (21.5%) had generalized anxiety disorder (GAD), 18 (19.3%) had alcohol dependence, 9 (9.6%) had bipolar disorder, 8 (8.6%) had drug dependence, 7 (7.5%) had schizophrenia, 8 (8.6%) had panic disorder, and 24 (25.8%) had other illnesses. Of the patients with MD, 30 (52.6%) presented with psychiatric comorbidities, as did 17 (85%) of those with GAD.

In the patient group, IR showed an inverse relationship with all impulsivity domains, with TI ($p = 0.023$), AI ($p = 0.010$), and AP ($p = 0.007$) being significant even after controlling for probable confounding variables. In this group, NOR and OR did not demonstrate a significant relationship. Among the healthy individuals, there were no statistically significant relationships between the religiosity and impulsivity domains (Table 2). Regarding the components OR, NOR, and IR, the coefficient of the explanation for the linear regression models adjusted for the healthy individuals and the patients varied from 0.18 to 0.30 and from 0.07 to 0.20, respectively.

DISCUSSION

The literature shows the presence of mental illness as one of the main risk factors for suicidality (Henriksson et al., 1993; Suominen et al., 1996). However, mental illness per se is unable to explain the entire complexity of suicidality. In this study, mentally ill patients who had attempted suicide were evaluated, as were healthy controls, by measuring levels of impulsivity and religiosity to analyze the relationship between the two.

In this context, bivariate analysis showed that the patients had much higher impulsivity levels and lower levels of religiosity in all domains than did the healthy controls, suggesting that the behavioral profile of greater religiosity and lower impulsivity may be a protective factor against SA (Caribé et al., 2012; Sisask et al., 2010).

The hypothesis that greater levels of religiosity are associated with less impulsivity has been strengthened by studies using positron emission tomography that revealed that religious practice stimulates the limbic system, increasing the activity of the autonomic centers of the nervous system, such as the hypothalamus, amygdala, and hippocampus (Newberg et al., 2001), modifying brain function, and reducing

TABLE 2. Religiosity and Impulsivity Domains in Healthy Controls and Patients

	Total Impulsivity		Attentional		Motor		Non-Planning	
	<i>B</i>	95% CI	β	95% CI	β	95% CI	β	95% CI
Controls								
OR	-1.21	[-3.03; 0.61]	-0.35	[-0.97; 0.25]	-0.49	[-1.34; 0.36]	-0.35	[-1.09; 0.37]
NOR	-1.07	[-2.80; 0.64]	-0.27	[-0.84; 0.30]	-0.32	[-1.13; 0.48]	-0.48	[-1.17; 0.20]
IR	-0.78	[-1.90; 0.33]	-0.21	[-0.59; 0.15]	-0.41	[-0.93; 0.10]	-0.14	[-0.60; 0.30]
Patients								
OR	-1.01	[-3.25; 1.23]	-0.35	[-0.96; 0.26]	-0.42	[-1.44; 0.58]	-0.23	[-1.10; 0.63]
NOR	0.42	[-1.56; 2.42]	-0.07	[-0.62; 0.47]	0.48	[-0.41; 1.37]	0.02	[-0.75; 0.79]
IR	-1.05	[-1.95; -0.14]*	-0.32	[-0.56; -0.07]*	-0.25	[-0.67; 0.16]	-0.47	[-0.82; -0.12]*

OR indicates organizational religiosity; NOR, non-organizational religiosity; IR, intrinsic religiosity; CI, confidence intervals.

**p* ≤ 0.05.

cortisol and pro-inflammatory interleukin plasmatic levels (Carrico et al., 2006; Lutgendorf et al., 2004). Additionally, religious practice promotes increased prefrontal cortex metabolism (Newberg et al., 2001) that in turn influences impulse control, decision-making, and moral judgments (Seybold, 2007). Moreover, other studies show an inverse relationship between religiosity, pathological gambling, and drug use, conditions generally associated with high levels of impulsivity (Ghandour and El Sayed, 2013; Gomes et al., 2013).

Therefore, greater religiosity is potentially related to less impulsivity. However, this could be altered by other factors, such as mental illness, as was found in the current study (Crews and Boettiger 2009; Estevez et al., 2013; Odlaug et al., 2013). We presume that healthy individuals can more easily practice their religiosity in its principal aspects, such as going to church (OR), meditating or praying (NOR), and incorporating religiosity into their lives (IR), without the cognitive and psychosocial impairments caused by mental illness (Iosifescu, 2012).

In the patient group, the inverse relationship between IR and the impulsivity domains, especially TI, AI, and AP, even after controlling for age and having children, may indicate that IR reflects the internalization of religious commitment in an individual's life. IR may become more stable and likely less influenced by the presence of mental illness. Incorporation of religiosity, among the religious dimensions, is most likely to correlate with the neural substrate that underlies religiosity because it can become a way of life that is lived, experienced, and continuously sustained (Hill et al., 2000; Muramoto, 2004). Thus, it would be less compromised by the presence of mental illness. Nevertheless, in this study, regarding the healthy individuals, the relationship between IR and the impulsivity domains, although it was inverted, was not significant, most likely because of the small number of controls evaluated.

Indeed, cross-sectional studies show that religiosity is associated with greater self-control and with personality traits such as amiability, conscientiousness, and empathy (McCullough and Willoughby, 2009; Pearson et al., 1986). Other longitudinal studies show that religious families tend to have less impulsive children who have more self-control (Bartkowski et al., 2008). Hence, greater religiosity during adolescence may positively mold personality traits in adulthood (Wink et al., 2007). However, other studies suggest that specific personality traits determine whether the individual becomes more or less religious (McCullough and Willoughby, 2009; Wink et al., 2007). Regardless, these results suggest that religious experience may reduce the expression of impulsivity, which could in and of itself decrease suicidality.

It is important to note that this complex relationship between religiosity, impulsiveness, mental illness, and suicidal behavior could be bidirectional; that is, just as mental illness might impair religious involvement, religiosity could, through multiple mechanisms, diminish

the expression of mental illness and impulsive behaviors and dissuade one from suicide (Seybold, 2007; Park, 2007).

Certain limitations are inherent in this work. This was a cross-sectional study; therefore, cause and effect relationships were not evaluated. The sample size was small, and all of the patients had been part of a subgroup of people who had attempted suicide by means of substances, warranting caution in interpreting the results. Additionally, because of the study's size, the patients were not evaluated for specific pathologies, which should be conducted in future studies.

Our data reveal that healthy individuals are more religious and less impulsive than are patients with mental disorders, suggesting that the presence of a mental illness may modify the relationship between impulsivity and religiosity or religiosity may affect the relationship between impulsivity and mental illness. Future research could help us to answer these questions.

DISCLOSURES

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The authors declare no conflict of interest.

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