
Brief report

Religiosity is a moderator of the relationship between impulsivity and internalizing symptoms

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Abstract

Background: There is growing interest in the role of religion in psychiatric disorders. Impulsivity is a psychological trait associated with acting without thinking, with a decision process favoring short-term outcomes without further consideration of its consequences, and is a risk factor for the development of mental disorders. **Objective:** In this study, the objective was to analyze the role of religiosity as a possible moderator between the association of impulsivity and internalizing psychiatric symptoms. **Methods:** The hypothesis was assessed in a cross-sectional study enrolling 366 adults evaluated using the abbreviated version of the Barratt Impulsiveness Scale-11, the Self Reporting Questionnaire-20, and the Duke Religion Index. **Results:** Internalizing symptoms were significantly influenced by an interaction between religiosity and impulsivity. Religiosity acted as a protective factor against internalizing symptoms only for participants with high impulsivity. **Discussion:** The results suggest a moderation role of religiosity in the association of impulsivity with internalizing symptoms.

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Introduction

Religion is a human adaptation related to social cognition processes, and probably a natural and universal human system¹. Recent studies suggest that religion has evolved as a form to solve everyday problems related to existential anxiety and social cohesion, using particularities of the memory and attention subsystems for cultural propagation^{1,2}. Religion is a key factor in human cooperation and strongly related to intragroup altruism, although it may reduce intergroup cooperation³. To uncover how or for whom religion affects human adaptation has become a topic of proficuous investigation, which seems particularly true in psychiatry and mental health. Several studies have shown higher levels of mental health on more religious people who usually shows lower levels of internalizing and externalizing symptoms⁴.

A key factor in understanding several psychiatric disorders is impulsivity⁵. Impulsivity is a psychological trait related to acting without proper thinking or failing to identify the consequences of a given behavior correctly⁶. In patients with psychiatric disorders, a higher impulsivity level is associated with poor functioning in everyday life, and with disruptive behavior, drug use, traffic accidents, physical violence, and worse clinical outcomes⁷. Religiosity, however, may be a factor facilitating impulse control.

Caribé *et al.*⁸ recently found a negative association between religiosity and impulsivity. Investigating a sample of healthy individuals and psychiatric inpatients who attempted suicide by substance use, they have proposed religiosity as a possible mediator of the association between impulsivity and mental health. In fact, in Western religions at least, impulse control – applied to aggressive behavior, sexual relations, substance use, and others – is a core feature of most of the largest monotheistic religions (i.e., Christianity, Judaism, and Islamism). Notwithstanding, it seems unlikely a mechanistic association between impulsivity and psychiatric symptoms through religiosity. It is reasonable to think in religiosity more as a contextual factor. Therefore, in the association between impulsivity and psychiatric symptoms, religiosity would be

a conditional or a moderation factor, not a mediator. A moderator is a variable that affects the direction or strength of the association between an independent and a dependent variable.

In this sense, this study sought to assess religiosity as a moderator of the association between impulsivity and psychiatric symptoms in a heterogeneous sample.

Methods

Participants

This study is part of a broader research on the relationship between religiosity and impulsivity and was approved by the local ethics board (CAAE: 57377516.8.0000.5134). All subjects gave consent to participate. The study is in line with Helsinki Declaration. The following data were collected during the first phase of the study, where subjects answered several questionnaires and scales about sociodemographic characteristics and mental health in a virtual platform sent by the internet⁹.

A sample of 366 volunteers participated in the study. Participants were usually young (mean age of 27.8 ± 9.7 years), predominantly female (N = 237), single (N = 268), with high education (≥ 11 years of education = 351), and coursing a bachelor degree (N = 251). In the sociodemographic questionnaire, 76 participants reported a history of mental disorders. Regarding religion, most of the sample was Catholic (N = 138) or Protestant (N = 82). Other religions comprised 61 participants. Differently from the expected pattern of religiosity in Brazil, there was a high number of atheists or agnostics in the sample (N = 85).

Assessment of mental health, impulsivity, and religiosity

Internalizing symptoms

Participants' mental health was assessed by using the Self-Reporting Questionnaire 20 (SRQ-20), a short instrument designed for the

assessment of non-psychotic symptoms¹⁰. The SRQ-20 comprises 20 binary questions related mainly to depression and anxiety and was previously validated for use in Brazilian adults. Higher scores represent higher frequency/intensity of internalizing symptoms¹⁰.

Impulsivity

The assessment of impulsivity was conducted using the abbreviated version of the Barratt Impulsiveness Scale 11 (ABIS-11)¹¹. The abbreviated version uses 13 questions to assess impulsivity and retains the validity and reliability of the original version. Higher scores are representative of higher impulsivity. Participants were stratified into three different impulsivity groups based on the adapted normative values for the ABIS-11 derived from the Brazilian normative data: low impulsivity (scores below the 25th percentile), typical impulsivity (scores ranging from percentile 25 to 75), and high impulsivity (scores above the 75th percentile).

Religiosity

The assessment of religiosity was done using the Duke Religion Index (DUREL) proposed by Koenig *et al.*¹². The DUREL comprises five questions related to organized religiosity (participation in social-religious groups), non-organized religiosity (participation in individual acts of praying, meditation or religious studies), and intrinsic religiosity (how religion influence the participant's life and behavior). A previous report using an online version suggests that the three DUREL subscales are highly interrelated and its psychometric characteristics are similar to the standard pen-paper version⁹. A principal component analysis was performed to reduce the three DUREL subscales to a single factor, which accounted for 82% of the test variance. This factor, named *religiosity*, was saved by the Anderson-Rubin method and transformed into standard scores (Mean = 0, Standard deviation = 1). Higher factor scores are representative of higher religiosity. Participants were stratified into three different religiosity groups: low religiosity (scores < -1), moderate religiosity (scores between -1 and 1) and high religiosity (scores > 1).

Statistical analyses

A general linear model was adopted to test religiosity as a moderator of the influence of impulsivity on mental health. SRQ-20 scores, representing internalizing symptoms, was used as the dependent variable and participant's classification on impulsivity (low, typical, high) and religiosity (low, moderate, high) were used as fixed factors. Age, education, and socioeconomic status (measured by a standard Brazilian measure, the *Brazilian Criterion of Economic Classification*) were entered as covariates. Moderation analysis was based on the interaction of impulsivity and religiosity, an analysis of its estimated marginal means.

Results

The general linear model used to assess the possible role of religiosity as a moderator of the association between impulsivity and internalizing symptoms was significant ($F = 14.73$, $p < 0.001$, $\eta_p^2 = 0.31$). The model showed main effects of impulsivity ($F = 51.00$, $p < 0.001$, $\eta_p^2 = 0.22$), religiosity ($F = 5.17$, $p < 0.001$, $\eta_p^2 = 0.03$), and age ($F = 5.69$, $p = 0.018$, $\eta_p^2 = 0.02$), but not of education ($p = 0.343$) or socioeconomic status ($p = 0.766$).

The interaction between religiosity and impulsivity was significant ($F = 44.64$, $p = 0.022$, $\eta_p^2 = 0.03$). Figure 1 shows the estimated marginal means after covariation for sociodemographic factors. An analysis of the estimated marginal means showed no differences regarding internalizing symptoms across religiosity groups for low and typical impulsivity individuals. However, at higher levels of impulsivity, participants with higher religiosity showed

significantly less internalizing symptoms than participants with high impulsivity and low religiosity (Mean difference -5.4, standard error 1.7, $p = 0.007$). Other comparisons involving participants with high impulsivity and moderate religiosity showed no significant differences when compared to low religiosity ($p = 0.208$) or high religiosity ($p = 0.145$).

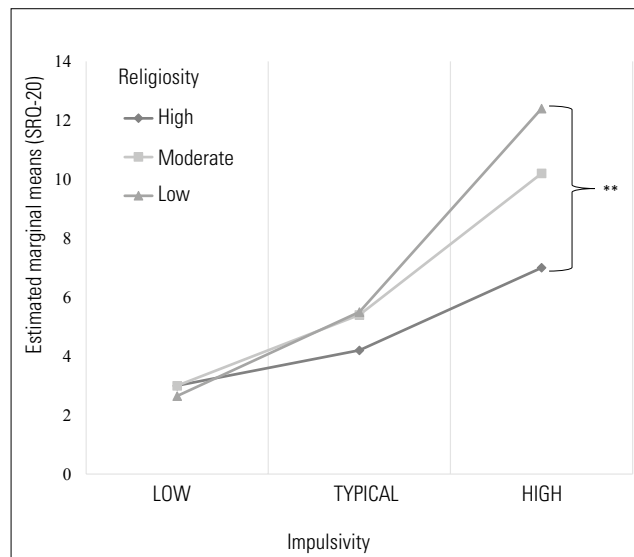


Figure 1. Estimated marginal means for SRQ-20 scores based on impulsivity and religiosity subgroups.

The figure shows the estimated marginal means (corrected by age, education and socioeconomic status) of internalizing symptoms measured by Self-Reporting Questionnaire 20 stratified by religiosity and impulsivity. There was a significant interaction between religiosity and impulsivity ($F = 44.64$, $p = 0.022$, $\eta_p^2 = 0.03$). Participants with high religiosity (measured by a standard score of Duke Religion Index) showed less internalizing symptoms than participants with low religiosity ($p = 0.007$), but only in the context of with high impulsivity (above percentile 75 in the Abbreviated version of Barratt Impulsiveness Scale). ** $p < 0.01$.

Discussion

Religiosity was a moderator of the association between impulsivity and internalizing symptoms in this sample of young adults. Participants with higher expression of impulsivity were shown to benefit from higher religiosity regarding mental health. The relationship of religiosity with impulsivity on internalizing symptoms in a heterogeneous sample is unsurprising considering that many psychiatric disorders can be understood as extreme expressions of typical psychological traits as shown in previously research in psychiatric disorders^{13,14}. These results suggest that religiosity influence the impact of impulsivity on internalizing symptoms only in the higher spectrum of impulsivity. For individuals with typical or low impulsivity, religiosity had no association with psychiatric outcomes.

Usually, religiosity is developed in infancy, when the child is exposed to the religious practices of her social environment¹. Religion is something relatively easy to learn during childhood since children are more prone to show a "common-sense dualism". Religion knowledge uses a series of attention and memory biases (such as minimal counterintuitive information), which facilitates its learning^{1,2}. In most of the Western religions, religion usually favors a group of core beliefs that regulates human behavior and condemns a series of impulsive behaviors and related outcomes (e.g., drug use, promiscuous sex, violence and others), at least, inside the religious group. It is interesting to note that childhood may be a particularly

sensitive period for teaching self-regulation strategies¹⁵. In this sense, if an individual grows up under a social restraint system of beliefs that discourage or punishes impulsive behavior, it is more likely that those behaviors do not occur. For those with higher impulsivity, religiosity may act improving self-regulation, reducing the adverse consequences of impulsivity in daily life and, consequently, protecting mental health.

This study has limitations that need to be addressed. The sample was recruited in an online platform, therefore, it consists of a convenience sample. Although this may increase data variability (for example, this sample had more atheists and agnostics than normally observed in the Brazilian population), it hinders the generalization of the results. The measures adopted in the study were all designed for screening and may not fully represent their underlying constructs. There were also no interview for diagnoses of mental disorders, only participants self-report.

In conclusion, religiosity was found a moderator of the influence of impulsivity on internalizing symptoms in a sample of Brazilian adults. The study reported a specific protective role of higher religiosity in mental health for highly impulsive participants. It adds new data in a proficuous field in Brazil, studies aiming the association between religion and health¹⁶. Further studies should investigate this relationship in more representative samples.

Disclosure

The author declared no conflict of interests.

Author contribution

Jonas Jardim de Paula designed the study, analyzed the data and wrote the manuscript.

The role of the funding source

The research was conducted in the absence or external funding sources.

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