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Impact of conspiracist ideation and psychotic-like experiences in patients with schizophrenia during the COVID-19 crisis

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\textbf{ABSTRACT}

Conspiratorial belief is a type of argument that accepts implausible explanations in situations of great uncertainty or mystery. Claiming that the coronavirus is an artificial fabrication of laboratories is an example of conspiracist belief. The aim of this research was to analyze the impact of conspiracist ideation and psychotic-like experiences in patients with schizophrenia, patients with other mental disorders, and participants with no psychiatric history with a 132-day follow-up during the COVID-19 crisis. Analysis of variance (ANOVA) was applied and Bayesian perspective, these individual differences are characterized by the presence of anxiety, stress, cognitive biases, and a tendency to experience new emotions (openness to experience) (Brotherton and French, 2014; Swami et al., 2016; Cichocka et al., 2015). At the psychiatric level, subclinical symptoms associated with paranoid and schizotypal personality traits predominate (Darwin et al., 2011; Barron et al., 2014; Dagnall et al., 2015; Dyrendal et al., 2021). Along these lines, there are also studies linking conspiracy theories to psychotic-like experiences (PLE) (Kelleher and Cannon, 2010; Livet et al., 2020). Although this concept is very broad, it is often considered an anomalous experience for two reasons (e.g., Brett et al., 2008): on the one hand, because they are disorders present in both the general and clinical population (see van Os et al., 2008; Moriyama et al., 2020), and on the other hand, because they are unusual or infrequent experiences when they occur in healthy subjects (Bourgin et al., 2020). Both schizotypy and PLEs are part of the psychotic phenotype (Preti et al., 2012). The psychotic phenotype is based on the idea that people with attenuated psychotic symptoms and PLEs are at risk for severe psychotic pictures than individuals without this type of symptom (Murphy et al., 2018; Fonseca-Pedrero et al., 2020). Following this idea, it is very likely that conspiracist ideations are also related to the psychotic phenotype and continuum since...
they represent one more feature of schizotypy (see Barron et al., 2014; van der Tempel and Alcock, 2015). Although the scientific literature yields strong evidence linking conspiracist ideation to schizotypy and PLEs in subjects without a psychiatric history, no studies have been identified that analyzed the individual differences in conspiracist ideation between healthy subjects and patients diagnosed with schizophrenia (Kwapil et al., 2020).

The COVID-19 pandemic generated changes in people’s lifestyle and mental health (Khan et al., 2020; Mattioli et al., 2020). Some studies reported an increase in depressive symptoms of anxiety pictures in the general population during the first months of the pandemic (Choi et al., 2020; Shevlin et al., 2020). Similarly, there is evidence that PLEs varied in the adolescent population before, during and after the first COVID-19 crisis (e.g., Wu et al., 2021). In this direction, there is also research that found an increase in psychotic symptomatology in healthy subjects and patients with severe psychosis (see Brown et al., 2020; Escolá-Gascón et al., 2020b). Considering these increases and that conspiracist ideation should probably be related to the psychotic phenotype, an analysis of the presence of conspiracist ideation in subjects with schizophrenia, its variation over the months of the COVID-19 pandemic and its comparison with scores in healthy subjects is imperative.

In the context of the COVID-19 crisis, the investigation of conspiracist ideation is crucial because it represents a variation of irrational thinking that has ceased to be marginal in society and has become a more predominant thought structure in the general population. This type of studies is essential since it helps to understand whether the impact of the popularization of conspiracy theories has developed similarly in healthy individuals and in patients suffering from schizophrenia or not. In addition, this could provide new insights into how conspiracy beliefs may be risk behaviors that predispose healthy individuals to suffer from possible psychotic episodes (see Escolá-Gascón and Wright, 2021).

Therefore, in this research, the following hypotheses are proposed: (1) subjects with schizophrenia will present more intense conspiracist ideation than healthy subjects; and (2) between October 2020 and February 2021, conspiracist ideation will have increased in both subjects with schizophrenia and subjects with no psychiatric history. The main objective of this research was to understand the relationship between psychotic symptoms and conspiracist ideation. Likewise, we also wanted to analyze how conspiracist ideation and psychotic symptoms varied throughout the coronavirus pandemic. Understanding these dynamics will enable more effective preventions aimed at combatting conspiracist ideation and psychotic symptomatology.

1. Methods

1.1. Statement of ethical guarantees

The author of this manuscript declares that this research was reviewed and favorably evaluated by the Committee of Ethical Guarantees of Ramon Llull University. Likewise, the author declares that all data collected from this study were anonymous and were blinded (including data related to the clinics and psychiatric centers that participated in this research). The procedures of this study adhere to the Spanish Government Data Protection Act 15/1999 and the Declaration of Helsinki of 1975, revised in 2013.

1.2. Participants

A total of 121 participants residing in Spain participated, of whom 39 had been formally diagnosed with schizophrenia, 43 had a psychiatric history (not including psychotic spectrum disorders) and 39 had no clinical mental health history. Sociodemographic information for all participants is provided in Table 1.

All the participants answered the questionnaires for this study completely voluntarily and anonymously. Likewise, the participants were also previously informed in writing of the development, stages and phases of this study. The application of the questionnaires was carried out completely online. Instead of signing a written consent form, participants had to click on an acceptance box that ensured their voluntary participation. Subsection 1.3.2 explains in more detail the procedures related to the test applications and inclusion criteria used in this project.

1.3. Procedures

1.3.1. Study design

The design of this research was quasi-experimental (i.e., no random assignment of subjects to the three groups mentioned). Comparisons were made between groups of participants with schizophrenia, with psychiatric history and healthy subjects. Analyses were longitudinal (based on repeated samples) and cross-sectional (based on independent samples).

Regarding the longitudinal analysis, due to the increase in psychotic symptomatology and pseudoscientific beliefs in the general population during the first social confinement related to coronavirus (see Escolá-Gascón et al., 2020b; Escolá-Gascón et al., 2021), it was decided to test whether these symptoms had remained stable between October (pretest) and February (posttest). The first week of October 2020 was chosen because a new wave of infections had started in Spain and new restrictive measures were implemented based on (1) the application of confinement by districts and/or municipalities; (2) the implementation of a 10 p.m. curfew; (3) the closure of establishments considered nonessential (e.g., gyms, cinemas, etc.); (4) the application of telematization at work and university; (5) the cancellation of popular parties and social events of more than six people; and (6) the closure of children’s areas and public gardens. This new wave of infections was also experienced by some countries, such as the United Kingdom, France and Germany. Initially, the posttests were intended to be carried out between the last week of December 2020 and the first week of January 2021 because these were the dates when the government would phase out the restrictions for the Christmas holidays. However, the cases did not decrease sufficiently, and the measures were extended into February. At the beginning of the second week of February 2021, the application of the posttests began because some of the social measures mentioned above were withdrawn. Between the first application of the tests and the second, approximately 132 and 139 days had elapsed.

Regarding the cross-sectional analyses, it was decided to compare groups of subjects with a diagnosis of schizophrenia, and with and

Table 1

| Groups                          | Age Means (SD) | Sex | Education level | Community |
|---------------------------------|----------------|-----|-----------------|-----------|
|                                 | M              | W   | HS          | VT        | US     | CLM | MAD | BNC |
| Patients with schizophrenia    | 35.38 (3.911)  | 35  | 4            | 13        | 21     | 5   | 9   | 18  | 12  |
| Participants with a psychiatric history | 36.37 (3.946)  | 19  | 24           | 17        | 15     | 11  | 13  | 16  | 14  |
| Participants with no psychiatric history | 35.05 (3.960)  | 18  | 21           | 11        | 12     | 16  | 9   | 9   | 21  |
| Total                           | 35.6 (3.339)   | 72  | 49           | 41        | 48     | 32  | 31  | 43  | 47  |

Note: SD = Standard deviation; M = Men; W = Women; HS = High school; VT = Vocational training; US = University studies; CLM = Castilla-La Mancha; MAD = Madrid; BCN = Barcelona.
without a psychiatric history. To assess the subjects who had received a diagnosis of schizophrenia and had a psychiatric history, six private mental health clinics collaborated. The participation of the clinics was voluntary, anonymous and with no profit motive. Each center assigned a responsible clinical psychologist or psychiatrist to manage the data collection. In contrast, participants with no clinical history were contacted from the original Escola-Gascón (2020a) database, in which each participant had an e-mail address. This database consisted of 3224 cases. The collection and follow-up of the sample is explained in subsection 1.3.3.

1.3.2. Inclusion criteria and data collection

All participants with a diagnosis of schizophrenia had to meet the following study inclusion criteria. (1) The patient had to possess a formal diagnosis of schizophrenia or the equivalent (e.g., psychotic spectrum disorders according to DSM-5) (see American Psychiatric Association, 2013) and the diagnosis had to be chronic (made at least one year prior to the date on which the patient agreed to participate in this study). (2) The patient had to be undergoing outpatient psychological treatment (with a minimum frequency of one visit per month, individually or in a group). (3) The patient had to be on a pharmacological treatment regimen supervised by a physician-psychiatrist. (4) The patient had to be in a stable phase of his or her illness (patients with acute psychotic symptoms were not included). (5) The patient had to be between 28 and 45 years of age. (6) The patient had to be in an adequate medical and psychological disposition to consciously answer the questionnaire of this study, meaning the following were not eligible: (6.1.) patients with cognitive deficits or impairments; (6.2.) patients hospitalized for medical reasons unrelated to this diagnosis; (6.3.) patients hospitalized because of their schizophrenia or on a day-hospital basis; or (6.4.) patients with other formally diagnosed chronic psychiatric disorders in addition to the diagnosis of schizophrenia. In this way, an attempt was made to reduce the variance associated with the comorbidity of psychotic disorders. Neither were (6.5.) patients with active suicidal ideation and/or previous suicide attempts accepted, or (6.6.) patients with declared handicaps or other medical illnesses that would disqualify them from participation in this study.

A clinical psychologist and/or psychiatrist previously evaluated which patients from their respective centers could be included in this study. What the research consisted of was then explained to the patient, who was asked if he or she wished to participate on a completely anonymous and voluntary basis. Only the psychologists or psychiatrists responsible for each center were aware of the patients’ data. Patient identification data were not recorded in the online application of the questionnaires. An alphanumeric code purposely developed by the heads of the collaborating clinical centers was used. The center coordinators were to give the code to each participant so that the combination of digits and letters could be recorded in the online application. The author and researcher of this study only used this code to correctly relate the data between the pretests and posttests. Likewise, the investigator at no time had contact with the patients. There were no incidents related to the treatment of patient data throughout the development of this study.

The inclusion criteria for participants who had or had a psychiatric history were as follows: (1) not having or having had a diagnosis of schizophrenia; (2) possess or be formally diagnosed with any mental disorder not included in the psychotic spectrum disorders; the diagnosis did not necessarily have to be chronic; (3) be between 28 and 45 years of age; (4) receiving or having received psychological and/or psychiatric treatment in the past; and (5) be in a medically and psychologically adequate disposition to consciously answer the questionnaires of this study. This criterion includes items 6.1., 6.2., 6.5. and 6.6. of the previous paragraph. In this case, the same conditions explained in the previous paragraph were applied for the anonymous collection of data. Thus, the researcher had no direct contact with these participants and was guided by an alphanumeric code for the appropriate relationship between the results of the pretests and posttests.

Finally, the inclusion criteria for the group with no psychiatric history were as follows: (1) not having any psychiatric diagnosis; and (2) never having consulted with either a psychiatrist or a psychologist for clinical purposes. The exclusion criteria 6.1., 6.2., 6.5. and 6.6. of the previous paragraphs were also used. For this type of participant, the researcher had to use the e-mail from the Escola-Gascón (2020a) database to properly follow up with the participants between pretests and posttests. The email was the only identifying data the researcher collected from this group of participants.

1.3.3. Obtaining the sample

The collection of the sample was possible thanks to the collaboration of six private mental health clinics located in the communities of Madrid, Catalonia and Castilla-La Mancha. Considering that the health clinics were private and did not want outsiders to know that their patients were participating in research projects, the centers that collaborated with the study chose to remain anonymous. Each center assigned a professional who would be responsible for assessing the suitability of the patients who would participate according to the inclusion criteria specified in subsection 1.3.2 (Fig. 1).

1.4. Materials

1.4.1. Community assessment of Psychic Experiences-42

This scale evaluates the psychotic phenotype with three dimensions: (1) Positive Dimension (PD), consisting of 20 items, (2) Negative Dimension (ND), consisting of 14 items, and (3) Depressive Dimension (DD), consisting of 8 items. The answers are coded using a Likert scale between 1 ("rarely") and 5 ("almost always"). In this research, only positive dimension and negative dimension were used. The Community Assessment of Psychic Experiences-42 (CAPE-42) presents enough evidence to endorse its validity and reliability (see Stefanis et al., 2002). The Spanish adaptation of the scale was used in this study (Fonseca-Pedrero et al., 2012). Cronbach’s alpha coefficients of this sample were satisfactory for all dimensions (>0.8).

1.4.2. Multivariable multiaxial suggestibility Inventory-2

The Multivariable Multiaxial Suggestibility Inventory-2 (MMSI-2) is a psychometric inventory developed by Escola-Gascón (2020a) consisting of 174 broad spectrum items whose subject matter focuses on anomalous phenomena as perceptual alterations (psychotic-like experiences). The MMSI-2 also includes other subsclinical personality scales and other psychological indicators to detect unconscious lying, cognitive biases, inconsistencies and deliberate fraud. Nevertheless, in this study, only 6 of the 20–22 total scales of the test were used. The scales used are described as follows: (1) Visual-Auditory Anomalous Phenomena (Pva) (11 items); (2) Tactile Anomalous Phenomena (Pt) (7 items); (3) Olfactory Anomalous Phenomena (Po) (7 items); (4) Cenesthesis Anomalous Phenomena (Pc) (9 items); (5) Schizotypy (Ex) (11 items); and (6) Paranoia (Pa) (10 items). In the MMSI-2 items, participants had to indicate to what degree (from 1 to 5) they considered the content of each item to be true. The MMSI-2 offers guarantees of validity and reliability (omega coefficients >0.8) (see Escola-Gascón, 2020a; 2020b). Cronbach’s alpha coefficients of this sample were also satisfactory for all scales (>0.8).

1.4.3. Generic conspiracist beliefs scale

The Generic Conspiracist Beliefs Scale (GCBS) is a 15-item questionnaire that measures the degree to which a person believes and accepts conspiracy theories as true. This test includes five conspiracy beliefs related to government malfeasance, extraterrestrial cover-up, malevolent global and personal wellbeing, and control of information. Responses are coded on a Likert scale from 1 to 5. The participant must indicate how much he/she agrees with each item. The GCBS has a total score that is reliable and valid (Brotherton et al., 2013). Subsequent
replications confirmed its psychometric goodness (see Drinkwater et al., 2020). In this study, we used a Spanish translation of our own elaboration. The reliability index based on the omega coefficient for the total test score was very satisfactory ($>0.9$). Cronbach’s alpha coefficient for this sample was excellent ($>0.9$).

1.5. Statistical analysis

The data were processed with JASP and JAMOVI software, which use the R programming language and are part of the same university project (see The Jamovi Project, 2020). A 2-factor analysis of variance (ANOVA) was applied: one factor was longitudinal (with pretest and posttest measures), and the other was completely randomized (had the categories "patients with schizophrenia", "participants with a psychiatric history" and "participants with no psychiatric history"). Statistical normality tests were previously analyzed with the Shapiro-Wilk fit coefficient, and the homogeneity of variances between the groups of the completely randomized factor was also examined. Effect size indices (based on the squared partial eta squared coefficients) and the Bayes factor in favor of the alternative hypothesis ($BF_{10}$) were added as a complement. The a priori probabilities were set at 50% for both the null hypothesis and the alternative hypothesis. In the case of mean comparisons, the $BF_{10}$ can be calculated from the following formula:

$$BF_{10} = \frac{\int_{H_1} P(D|\theta_{H_1}, H_1) \pi(\theta_{H_1}|H_1) d\theta_{H_1}}{\int_{H_0} P(D|\theta_{H_0}, H_0) \pi(\theta_{H_0}|H_0) d\theta_{H_0}} \frac{P(D|H_1)}{P(D|H_0)}$$

where:

$P(D|H_1)$ is the probability that the empirical data fit the distribution associated with the alternative hypothesis. In contrast, $P(D|H_0)$ is the probability that the data fit the expected distribution by chance. A $BF_{10}$ greater than 10 provides evidence to discard the null hypothesis and retain the alternative.

2. Results

2.1. Descriptive statistics and normality tests

Descriptive statistics were calculated for all variables. Descriptive statistics are presented for both the marginal measures and the measures for each group. This information can be found in Tables 2 and 3.

The probability that the observed data conformed to statistical normality was also calculated. These calculations are presented in Appendix A. All variables were classified according to patient groups and participants with and without psychiatric history sufficiently to the properties of the normal distribution.

2.2. Analysis of variance (ANOVA) 2x3

In two-factor ANOVAs, there are 4 types of effects to be analyzed: main effects, interaction effects, simple effects (also called simple main effects) and simple interaction effects between cells. Both main and interaction effects analyze differences based on marginal means. In contrast, the 2 types of simple effects are based on the comparison of the
direct means of each of the variables distributed according to the groups to be tested. Table 4 should be consulted for a better understanding of these types of effects.

Table 4 makes it easy to understand which contrasts were applied in this research. Comparisons between the means of the marginal cells are equivalent to main effects. In contrast, comparisons of the means between the "ij" cells (e.g., AA vs. BB) correspond to simple effects. Table 5 presents the main and interaction effects for the nine dependent variables.

Table 4

| Groups | Longitudinal tests | Main effects |
|--------|--------------------|--------------|
|        | A_1 - Pretests     | B_1 - Posttests |
| A_1 - Patients with Schizophrenia | Means AA | Means AB | Means A+ |
| B_1 - Participants with a psychiatric history | Means BA | Means BB | Means B+ |
| C_1 - Patients with no psychiatric history | Means CA | Means CB | Means C+ |
| Main effects | +A | +B | ++ |

Note: The annotations in this table come from the proposals for Pardo and Ruiz (2015). Use the codes in each cell to understand the comparisons of the means in Tables 6-13.

The results in Table 5 indicate that there was significant variation between the pretests and posttests of conspiracist ideation (CI) and anomalous tactile perceptions (Pt). The marginal means (see Table 2) indicated that beliefs in conspiracy theories and tactile perceptual disturbances had increased after this second period of social-health restrictions. The other variables showed no significant changes. Therefore, the hypothesis that beliefs in conspiracy theories increased during the coronavirus pandemic is maintained. Social health restrictions explained 35.2% of the increase in scores.

The groups of patients and participants with and without psychiatric history showed significant differences for all variables except for anomalous olfactory perceptions (Po), in which no significant results were observed. The marginal means of each type of group (see Table 2) indicated that patients diagnosed with schizophrenia presented the highest scores compared to the rest of the groups. However, the Bayes factor for the conspiracist ideation variable was less than 10, and the variance explained was 6%. This means that there are reasons to be conservative and maintain the null hypothesis; patients with schizophrenia did not have higher CI scores than the other subject groups. Table 6 through 13 present the analyses of the simple effects and simple interaction effects.

The simple effects of the Po variable were not included because the results in Table 5 for this variable were not significant. The results in the above tables are summarized according to subject groups:
(1) For the group of subjects with no psychiatric history, the CI, Pva, Pt, Pc and ND scores significantly increased after the intervention. The effect sizes for these variables were medium (−0.4) and small (−0.1).

(2) For the group of subjects with a psychiatric history, the scores of the CI, Pva, Pt, Pc and PD scales significantly increased after the confinement period.

(3) For patients with schizophrenia, only the CI and Pce scale scores showed significant variations. Beliefs in conspiracy theories had increased. In contrast, cenesthetical hallucinations had decreased.

One result to note is the following: Table 6 shows significant differences between the CI scores of patients with schizophrenia and those of participants with no psychiatric history. In this case, the healthy subjects scored 7.154 points lower than the patients with schizophrenia. The effect size of this contrast was medium (0.333). This result in the simple effects replaces the hypothesis decision taken from Table 5. Therefore, the subjects with schizophrenia did score higher on CI than the other groups of participants.

In relation to the simple interaction effects of CI, it is crucial to note that the increase in conspiratorial beliefs in the healthy posttest subjects (M = 49.21) did not exceed the value of the mean of the subjects with schizophrenia pretests (M = 50.90). However, this difference was not significant. This observation is essential because the simple pretest and posttest effects on CI did show significant differences between patients and participants with no psychiatric history. The increase in CI in the healthy participants reached similar levels as in the patients with schizophrenia. This calls into question whether the patients’ CI values are clinically significant scores or whether they are results within the subclinical (nonpsychopathological) spectrum. Figs. 2 and 3 show the graphs of the CI means for each of the groups.

### Table 5

| DV    | IV            | F (p values)       | Post hoc p values with Bonferroni correction | BF10 (% estimated error) | F(H1|D) | σ²_Hand |
|-------|---------------|--------------------|----------------------------------------------|--------------------------|------|---------|
| CI    | Prepost       | 64.094 (<0.001*)   | –                                            | 20.860 (1.669%)          | 0.954 | 0.352   |
|       | Groups        | 4.854 (0.009*)     | 1 vs. 2 = 0.377                              | 5.319 (2.465%)           | 0.842 | 0.060   |
|       |               |                    | 1 vs. 3 = 0.007*                              |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.366                              |                          |      |         |
| Ez    | Interaction   | 3.463 (0.003*)     | –                                            | 1.219 (2.957%)           | 0.549 | 0.005   |
|       | Prepost       | 0.183 (0.670)      | –                                            | 0.158 (2.944%)           | 0.136 | 0.002   |
|       | Groups        | 90.366 (<0.001*)   | 1 vs. 2 = <0.001*                             | 27.184 (3.047%)          | 0.965 | 0.605   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.230                              |                          |      |         |
| Pa    | Interaction   | 0.223 (0.801)      | –                                            | 0.090 (4.009%)           | 0.083 | 0.004   |
|       | Prepost       | 0.066 (0.794)      | –                                            | 0.146 (2.251%)           | 0.127 | 0.001   |
|       | Groups        | 64.567 (<0.001*)   | 1 vs. 2 = <0.001*                             | 24.824 (2.327%)          | 0.961 | 0.523   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.475                              |                          |      |         |
| Pva   | Interaction   | 0.006 (0.994)      | –                                            | 0.078 (2.972%)           | 0.072 | <0.001  |
|       | Prepost       | 20.539 (<0.001*)   | –                                            | 9.444 (1.695%)           | 0.909 | 0.148   |
|       | Groups        | 24.883 (<0.001*)   | 1 vs. 2 = <0.001*                             | 840.308 (1.569%)         | 0.999 | 0.297   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.310                              |                          |      |         |
| Pt    | Interaction   | 7.377 (<0.001*)    | –                                            | 28.939 (2.056%)          | 0.967 | 0.111   |
|       | Prepost       | 12.232 (<0.001*)   | –                                            | 37.769 (1.450%)          | 0.974 | 0.094   |
|       | Groups        | 25.199 (<0.001*)   | 1 vs. 2 = <0.001*                             | 32.933 (4.169%)          | 0.971 | 0.299   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.111                              |                          |      |         |
| Pce   | Interaction   | 3.585 (0.031)      | –                                            | 1.605 (3.522%)           | 0.616 | 0.057   |
|       | Prepost       | 5.764 (0.018)      | –                                            | 1.428 (13.593%)          | 0.588 | 0.047   |
|       | Groups        | 46.583 (<0.001*)   | 1 vs. 2 = <0.001*                             | 28.454 (13.593%)         | 0.966 | 0.441   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.015                              |                          |      |         |
| Po    | Interaction   | 23.827 (<0.001*)   | –                                            | 16.390 (13.65%)          | 0.942 | 0.288   |
|       | Prepost       | 0.100 (0.752)      | –                                            | 0.146 (4.038%)           | 0.127 | 0.001   |
|       | Groups        | 3.195 (0.045)      | 1 vs. 2 = —1                                 | 1.581 (3.510)            | 0.613 | 0.051   |
|       |               |                    | 1 vs. 3 = 0.044                              |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.082                              |                          |      |         |
| PD    | Interaction   | 0.121 (0.886)      | –                                            | 0.098 (6.336%)           | 0.089 | 0.002   |
|       | Prepost       | 7.811 (0.006*)     | –                                            | 5.890 (2.417%)           | 0.855 | 0.062   |
|       | Groups        | 150.952 (<0.001*)  | 1 vs. 2 = <0.001*                             | 47.188 (2.669%)          | 0.970 | 0.719   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = <0.001*                             |                          |      |         |
| ND    | Interaction   | 2.360 (0.099)      | –                                            | 0.564 (6.221%)           | 0.361 | 0.036   |
|       | Prepost       | 0.120 (0.730)      | –                                            | 0.147 (2.515%)           | 0.128 | 0.001   |
|       | Groups        | 58.121 (<0.001*)   | 1 vs. 2 = <0.001*                             | 19.447 (3.182%)          | 0.951 | 0.496   |
|       |               |                    | 1 vs. 3 = <0.001*                             |                          |      |         |
|       |               |                    | 2 vs. 3 = 0.500                              |                          |      |         |
|       |               |                    | Interaction                                   | 0.686 (0.506)            | 0.133 | 0.059   |

Note: *p < 0.01; DV = Dependent variables; IV = Independent variables; 1 = patients with schizophrenia; 2 = participants with psychiatric history; 3 = participants with no psychiatric history; F = Fisher’s test; BF10 = Bayes Factors in favor of alternative hypothesis; Etas partial square = explained variance of the VIs over VDs; CI = Conspiracist ideation; Ez = Schizotypy; Pa = Paranoia; Pva = Anomalous Visual/Auditory Perceptions; Pt = Anomalous Tactile Perceptions; Po = Anomalous Olfactory Perceptions; Pce = Anomalous Synesthetic Perceptions; PD = Positive Dimension; ND = Negative Dimension.

2.3. Correlation analysis

Taking into account the above significant differences, the scores of the dependent variables were correlated to test the degree of relationship between psychotic-like experiences, conspiracist ideation and psychotic phenotype. The pretest scales were correlated with the...
### Table 6
Simple main and interaction effects analysis for Conspiracist ideation (CI).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower | Upper   |        |          |           |
| CA vs. BA        | −2.722          | −8.400 | 2.957   | 1.905  | −1.429   | −0.130    |
| CA vs. AA        | −7.154          | −12.970 | −1.338 | 1.950  | −3.668*  | −0.333    |
| CA vs. CB        | −5.462          | −8.487 | −2.436 | 1.010  | −5.409*  | −0.492    |
| CA vs. BB        | −8.582          | −14.261 | −2.903 | 1.905  | −4.506*  | −0.410    |
| BA vs. AA        | −9.615          | −15.431 | −3.800 | 1.950  | −4.930*  | −0.448    |
| BA vs. CB        | −4.432          | −10.111 | 1.247  | 1.905  | −2.327   | −0.212    |
| BA vs. BB        | −2.740          | −8.419 | 2.939   | 1.905  | −1.439   | −0.131    |
| BA vs. BB        | −5.860          | −8.742 | −2.979 | 0.962  | −6.094*  | −0.554    |
| AA vs. CB        | −6.894          | −12.573 | −1.215 | 1.905  | −3.620*  | −0.329    |
| AA vs. BB        | 1.692           | −4.123 | 7.508   | 1.905  | 0.866    | 0.079     |
| AA vs. BB        | −1.428          | −7.107 | 4.251   | 1.905  | −0.750   | −0.068    |
| AA vs. AB        | −2.462          | −5.487 | 0.564   | 1.010  | −2.438   | −0.222    |
| CB vs. BB        | −3.120          | −8.799 | 2.558   | 1.905  | −1.638   | −0.149    |
| CB vs. AB        | −4.154          | −9.970 | 1.662   | 1.905  | −2.130   | −0.194    |
| BB vs. AB        | −1.033          | −6.712 | 4.645   | 1.905  | −0.543   | −0.049    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.

### Table 7
Simple main and interaction effects analysis for Schizotypy (Ez).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower | Upper   |        |          |           |
| CA vs. BA        | −2.063          | −6.417 | 2.290   | 1.462  | −1.411   | −0.128    |
| CA vs. AA        | −16.333         | −20.792 | −11.875 | 1.497  | −10.909* | −0.992    |
| CA vs. CB        | −0.692          | −2.010 | 3.394   | 0.902  | 0.768    | 0.070     |
| CA vs. BB        | −1.970          | −6.324 | 2.383   | 1.462  | −1.348   | −0.123    |
| CA vs. AB        | −16.462         | −20.920 | −12.003 | 1.497  | −10.994* | −0.999    |
| BA vs. AA        | −14.270         | −18.624 | −9.917  | 1.462  | −9.761*  | −0.887    |
| BA vs. CB        | 2.756           | −1.598 | 7.109   | 1.462  | 1.885    | 0.171     |
| BA vs. BB        | 0.092           | −2.480 | 2.666   | 0.859  | 0.108    | 0.010     |
| BA vs. AB        | −14.398         | −18.752 | −10.045 | 1.462  | −9.848*  | −0.895    |
| AA vs. CB        | 17.026          | 12.567 | 21.484  | 1.497  | 11.371*  | 1.034     |
| AA vs. BB        | 14.363          | 10.010 | 18.717  | 1.462  | 9.824*   | 0.893     |
| AA vs. AB        | −0.128          | −2.830 | 2.574   | 0.902  | −0.142   | −0.013    |
| CB vs. BB        | −2.662          | −7.016 | 1.691   | 1.462  | −1.821   | −0.166    |
| CB vs. AB        | −17.154         | −21.612 | −12.695 | 1.497  | −11.457* | −1.042    |
| BB vs. AB        | −14.491         | −18.845 | −10.138 | 1.462  | −9.912*  | −0.901    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.

### Table 8
Simple main and interaction effects analysis for Paranoia (Pa).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower | Upper   |        |          |           |
| CA vs. BA        | −1.624          | −5.345 | 2.096   | 1.248  | −1.302   | −0.118    |
| CA vs. AA        | −12.308         | −16.118 | −8.497  | 1.278  | −9.631*  | −0.876    |
| CA vs. CB        | −0.051          | −2.057 | 1.955   | 0.669  | −0.077   | −0.007    |
| CA vs. BB        | −1.717          | −5.438 | 2.003   | 1.248  | −1.376   | −0.125    |
| CA vs. AB        | −12.462         | −16.272 | −8.651  | 1.278  | −9.751*  | −0.886    |
| BA vs. AA        | −10.683         | −14.404 | −6.963  | 1.248  | −8.561*  | −0.778    |
| BA vs. CB        | 1.573           | −2.148 | 5.294   | 1.248  | 1.261    | 0.115     |
| BA vs. BB        | −0.093          | −2.003 | 1.817   | 0.638  | −0.146   | −0.013    |
| AA vs. CB        | −10.837         | −14.558 | −7.117  | 1.248  | −8.684*  | −0.789    |
| AA vs. BB        | 12.256          | 8.446  | 16.067  | 1.278  | 9.590*   | 0.872     |
| AA vs. AB        | 10.590          | 8.670  | 14.311  | 1.248  | 8.486*   | 0.771     |
| AA vs. AB        | −0.154          | −2.160 | 1.852   | 0.669  | −0.230   | −0.021    |
| CB vs. BB        | −1.666          | −5.387 | 2.055   | 1.248  | −1.335   | −0.121    |
| CB vs. AB        | −12.410         | −16.221 | −8.600  | 1.278  | −9.711*  | −0.883    |
| BB vs. AB        | −10.744         | −14.465 | −7.024  | 1.248  | −8.610*  | −0.783    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.
### Table 9
**Simple main and interaction effects** analysis for Visual-Auditory Anomalous Phenomena (Pva).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower                     | Upper          |        |           |
| CA vs. BA        | -0.512          | -3.233                    | 2.208          | 0.914  | -0.560    | -0.051    |
| CA vs. AA        | -6.385          | -9.171                    | -3.599         | 0.936  | -6.820*   | -0.620    |
| CA vs. CB        | -1.513          | -3.316                    | 0.290          | 0.602  | -2.514    | -0.229    |
| CA vs. BB        | -3.675          | -6.935                    | -0.955         | 0.914  | -4.020*   | -0.365    |
| BA vs. AA        | -8.572          | -11.145                   | -5.373         | 0.886  | -1.131    | -0.128    |
| BA vs. CB        | -1.001          | -3.272                    | 1.720          | 0.914  | -1.095    | -0.100    |
| BA vs. BB        | -3.163          | -4.880                    | -1.146         | 0.573  | -5.519*   | -0.502    |
| AA vs. CB        | 4.872           | 2.086                     | 7.658          | 0.914  | 5.204*    | 0.473     |
| AA vs. BB        | 1.870           | -0.013                    | 5.430          | 0.914  | 2.644     | 0.269     |
| AA vs. AB        | 0.026           | -1.177                    | 1.829          | 0.602  | 0.043     | 0.004     |
| CB vs. BA        | -2.162          | -4.883                    | 0.558          | 0.914  | -2.365    | -0.215    |
| CB vs. AB        | -4.846          | -7.632                    | -2.060         | 0.936  | -5.176*   | -0.471    |
| BB vs. AB        | -2.684          | -5.404                    | 0.037          | 0.914  | -2.936    | -0.267    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.

### Table 10
**Simple main and interaction effects** analysis for Tactile Anomalous Phenomena (Pt).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower                     | Upper          |        |           |
| CA vs. BA        | -1.561          | -4.215                    | 0.914          | -0.890 | -1.753    | -0.159    |
| CA vs. AA        | -6.179          | -8.898                    | -3.461         | 0.911  | -6.790*   | -0.616    |
| CA vs. CB        | -6.641          | -2.002                    | 0.720          | 0.454  | -1.411    | -0.128    |
| CA vs. BB        | -3.398          | -6.052                    | -0.743         | 0.890  | -3.818*   | -0.347    |
| CA vs. AB        | -6.410          | -9.129                    | -3.692         | 0.911  | -7.033*   | -0.639    |
| BA vs. AA        | -4.619          | -7.274                    | -1.964         | 0.890  | -5.190*   | -0.472    |
| BA vs. CB        | 0.919           | -1.735                    | 3.574          | 0.890  | 1.033     | 0.094     |
| BA vs. BB        | -1.837          | -3.133                    | -0.541         | 0.433  | -4.246*   | -0.386    |
| BA vs. AB        | -4.850          | -7.504                    | -2.195         | 0.890  | -5.449*   | -0.495    |
| AA vs. CB        | 5.538           | 2.820                     | 8.257          | 0.911  | 6.076*    | 0.552     |
| AA vs. BB        | 2.782           | 0.127                     | 5.436          | 0.890  | 3.125     | 0.284     |
| AA vs. AB        | -0.231          | -1.592                    | 1.130          | 0.454  | -0.508*   | -0.046    |
| CB vs. BB        | -2.757          | -5.411                    | -0.102         | 0.890  | -3.097*   | -0.282    |
| CB vs. AB        | -5.769          | -8.488                    | -3.051         | 0.911  | -6.330*   | -0.575    |
| BB vs. AB        | -3.013          | -5.667                    | -0.358         | 0.890  | -3.385    | -0.308    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.

### Table 11
**Simple main and interaction effects** analysis for Cenesthesic Anomalous Phenomena (Pc).

| Means comparison | Mean difference | Confidence Interval (95%) | Standard error | t-test | Cohen’s d |
|------------------|-----------------|---------------------------|----------------|--------|-----------|
|                  |                 | Lower                     | Upper          |        |           |
| CA vs. BA        | -1.806          | -3.866                    | 0.255          | 0.692  | -2.609    | -0.237    |
| CA vs. AA        | -7.846          | -9.956                    | -5.736         | 0.709  | -11.069*  | -1.006    |
| CA vs. CB        | -1.897          | -3.242                    | -0.553         | 0.449  | -4.228*   | -0.384    |
| CA vs. BB        | -3.643          | -5.703                    | -1.583         | 0.692  | -5.263*   | -0.478    |
| BA vs. AA        | -8.059          | -8.389                    | 0.709          | -8.392*| -0.763    |
| BA vs. CB        | -6.041          | -8.101                    | -3.980         | 0.692  | -8.727*   | -0.793    |
| BA vs. BB        | 0.092           | -2.152                    | 1.968          | 0.692  | -0.133    | -0.012    |
| BA vs. AB        | -1.837          | -3.118                    | -0.557         | 0.427  | -4.298*   | -0.391    |
| AA vs. CB        | -6.203          | -6.203                    | -0.012         | 0.692  | -5.986*   | -0.544    |
| AA vs. BB        | 5.949           | 3.839                     | 8.059          | 0.709  | 8.392*    | 0.763     |
| AA vs. AB        | 4.203           | 2.143                     | 6.264          | 0.692  | 6.073*    | 0.552     |
| AA vs. AB        | 1.897           | 0.553                     | 3.242          | 0.449  | 4.228*    | 0.384     |
| CB vs. BA        | -1.745          | -3.866                    | 0.315          | 0.692  | -2.522    | -0.229    |
| CB vs. AB        | -4.051          | -6.161                    | -1.941         | 0.709  | -5.715*   | -0.520    |
| BB vs. AB        | -2.306          | -4.366                    | -0.246         | 0.692  | -3.331    | -0.303    |

Note: *p < 0.01. Bonferroni’s correction was applied to all comparisons.
Warning: Pretest and posttest comparisons (simple main effects) are highlighted in bold.
posttests. Tables 14–16 provide Pearson’s linear correlations. Correlation matrices indicated that conspiracist ideation was significantly and positively correlated with schizotypy, psychotic-like experiences and positive symptoms of psychosis. These correlations were consistent for all three groups of subjects. Schizotypy was also positively correlated in all groups with some psychotic-like experiences.
This result was not expected. The correlations in Tables 14 and 15 indicate that conspiracist ideation is related to schizotypy, psychotic phenotype, and some perceptual disturbances. The results raise the following questions: (1) Why on some scales did scores increase for participants with no clinical history and not for subjects with schizophrenia? (2) Why did psychotic-like experiences remain stable and cenesthetic hallucinations decrease in the posttests for the patient group? (3) Why was conspiracist ideation not correlated with negative symptoms of psychosis? and (4) Are there psychopathological risks associated with conspiracist ideation?

### 3. Discussion

The aim of this research was to determine the impact of conspiracist ideation in groups of nonclinical, clinical and schizophrenia-diagnosed subjects. The impact of psychosis-like experiences and negative symptoms of psychosis was also analyzed. It is concluded that conspiracist ideation is more present in schizophrenic patients than in healthy participants. A reduction in Pc scores (Cenesthetic alternations) was observed in the posttests in the group of patients with schizophrenia. This result was not expected. The correlations in Tables 14 and 15 indicated that conspiracist ideation is related to schizotypy, psychotic phenotype, and some perceptual disturbances. The results raise the following questions: (1) Why on some scales did scores increase for participants with no clinical history and not for subjects with schizophrenia? (2) Why did psychotic-like experiences remain stable and cenesthetic hallucinations decrease in the posttests for the patient group? (3) Why was conspiracist ideation not correlated with negative symptoms of psychosis? and (4) Are there psychopathological risks associated with conspiracist ideation?

### 3.1 Interpretation of the results

In relation to the first and second questions, it is important to keep in mind that the patients with schizophrenia who participated in this research were treated with antipsychotics. In some cases, the therapeutic doses could have varied and increased, generating a decrease in perceived hallucinations (see Sommer et al., 2012). Similarly, it is possible that pharmacological treatment may have promoted the stabilization of psychotic-like experiences during these 132 days. These reasons may explain why the perceptual disturbances in the patient and positive symptoms of psychosis but not with negative symptoms (ND). Overall, the most relevant correlations in Tables 14–16 supported the hypotheses put forward in this research.

| Table 14 | Pearson correlation matrix between pretest scales and posttest scales for group patients. |
|----------|-------------------------------------------------------------------------------------|
|          | Cl | Ez | Pa | Pva | Pc | Pt | Po | PD | ND |
| Posttests |    |    |    |     |    |    |    |    |    |
| CI        | 0.759* | 0.746* | 0.302 | 0.557* | 0.769* | 0.774* | 0.72* | 0.447* | 0.11 |
| Ez        | 0.678* | 0.882* | 0.274 | 0.476* | 0.685* | 0.602* | 0.631* | 0.566* | 0.022 |
| Pa        | 0.303 | 0.198 | 0.763* | 0.323 | 0.348 | 0.367 | 0.261 | 0.013 | 0.162 |
| Pva       | 0.376* | 0.318 | 0.277 | 0.657* | 0.733* | 0.708* | 0.614* | 0.426* | 0.151 |
| Pc        | 0.224 | 0.324 | 0.13 | 0.521* | 0.587* | 0.574* | 0.627* | 0.243 | 0.14 |
| Pt        | 0.273 | 0.377* | 0.128 | 0.672* | 0.744* | 0.777* | 0.495* | 0.373 | 0.236 |
| Po        | 0.49* | 0.491* | 0.032 | 0.662* | 0.891* | 0.866* | 0.787* | 0.537* | 0.253 |
| PD        | 0.554* | 0.56* | 0.116 | 0.65* | 0.836* | 0.822* | 0.772* | 0.767* | 0.236 |
| ND        | 0.115 | –0.18 | 0.072 | 0.076 | 0.178 | 0.133 | 0.037 | –0.105 | 0.75* |

Note: *p < 0.01. CI = Conspiracist ideation; Ez = Schizotypy; Pa = Paranoia; Pva = Anomalous Visual/Auditory Perceptions; Pt = Anomalous Tactile Perceptions; Po = Anomalous Olfactory Perceptions; Pc = Anomalous Synesthetic Perceptions; PD = Positive Dimension; ND = Negative Dimension.

| Table 15 | Correlation matrix between pretest scales and posttest scales for group participants with psychiatric history. |
|----------|-------------------------------------------------------------------------------------------------------------|
|          | Cl | Ez | Pa | Pva | Pc | Pt | Po | PD | ND |
| Posttests |    |    |    |     |    |    |    |    |    |
| CI        | 0.758* | 0.478* | 0.366* | 0.394* | 0.876* | 0.731* | 0.575* | 0.58* | 0.333 |
| Ez        | 0.813* | 0.591* | 0.214 | 0.313 | 0.686* | 0.715* | 0.542* | 0.648* | 0.384* |
| Pa        | 0.165 | –0.152 | 0.213 | 0.192 | 0.406* | 0.398* | 0.021 | –0.096 | 0.156 |
| Pva       | 0.373* | 0.601 | 0.34 | 0.332 | 0.746* | 0.655* | 0.598* | 0.454* | 0.297 |
| Pc        | 0.467* | 0.337 | 0.33 | 0.506* | 0.617* | 0.74* | 0.363* | 0.333 | 0.199 |
| Pt        | 0.606* | 0.636* | 0.142 | 0.351 | 0.735* | 0.722* | 0.638* | 0.627* | 0.255 |
| Po        | 0.533* | 0.361* | –0.034 | 0.211 | 0.526* | 0.475* | 0.468* | 0.762* | 0.203 |
| PD        | 0.102 | 0.028 | –0.168 | 0.106 | 0.138 | 0.062 | 0.138 | 0.186 | 0.399* |

Note: *p < 0.01. CI = Conspiracist ideation; Ez = Schizotypy; Pa = Paranoia; Pva = Anomalous Visual/Auditory Perceptions; Pt = Anomalous Tactile Perceptions; Po = Anomalous Olfactory Perceptions; Pc = Anomalous Synesthetic Perceptions; PD = Positive Dimension; ND = Negative Dimension.

| Table 16 | Correlation matrix between pretest scales and posttest scales for group participants with no psychiatric history. |
|----------|-------------------------------------------------------------------------------------------------------------|
|          | Cl | Ez | Pa | Pva | Pc | Pt | Po | PD | ND |
| Posttests |    |    |    |     |    |    |    |    |    |
| CI        | 0.68* | 0.663* | 0.122 | 0.095 | 0.504* | 0.531* | 0.407* | 0.74* | –0.239 |
| Ez        | 0.4* | 0.451* | 0.17 | –0.183 | 0.198 | 0.186 | 0.268 | 0.575* | –0.284 |
| Pa        | 0.152 | 0.343 | 0.647* | 0.605* | 0.411* | 0.414* | 0.279 | 0.068 | 0.127 |
| Pva       | 0.225 | 0.437* | 0.261 | 0.416* | 0.699* | 0.559* | 0.312 | 0.266 | 0.055 |
| Pc        | 0.279 | 0.332 | –0.105 | 0.363 | 0.486* | 0.394* | 0.302 | 0.34 | 0.285 |
| Pt        | 0.35 | 0.658* | 0.003 | 0.332 | 0.575* | 0.72* | 0.662* | 0.427* | 0.079 |
| Po        | 0.632* | 0.694* | 0.3 | 0.396* | 0.682* | 0.663* | 0.7* | 0.515* | 0.061 |
| PD        | 0.501* | 0.602* | 0.312 | 0.055 | 0.4* | 0.417* | 0.406* | 0.893* | –0.268 |
| ND        | –0.057 | –0.221 | –0.046 | 0.212 | 0.221 | –0.014 | –0.018 | –0.21 | 0.791* |

Note: *p < 0.01. CI = Conspiracist ideation; Ez = Schizotypy; Pa = Paranoia; Pva = Anomalous Visual/Auditory Perceptions; Pt = Anomalous Tactile Perceptions; Po = Anomalous Olfactory Perceptions; Pc = Anomalous Synesthetic Perceptions; PD = Positive Dimension; ND = Negative Dimension.
group did not vary significantly. In addition, the patients with schizo-
phrenia included in this study did not suffer any psychotic episodes
during the follow-up of this investigation. This is also important because
if they had, the scores on the Pva, Pc, Pt, Po and PD scales should have
changed. Changes were observed in the scores relative to the rest of the
groups, which are also in line with these arguments.

The third question asks which dimensions of the psychotic pheno-
type (or schizotypy) conspiracist ideation are correlated. The results of
this research show that conspiracist ideation is exclusively related to
schizotypy on the dimension of positive symptoms and psychotic-like
experiences. It is important to note that the MMSSI-2 schizotypy scale
(Ez) focuses its contents or items on positive symptoms but also includes
magical thinking and irrational beliefs. Given this feature, it is very
likely that conspiracist ideation is also correlated with magical ideation.
Magical ideation is a schizotypal personality trait directly associated
with paranormal and pseudoscientific beliefs (see Williams and Irwin,
1991; Karcher and Shean, 2012). This idea would be consistent with the
results provided by Dyrendal et al. (2021), who propose magical and
paranormal beliefs as a mediating variable in the relationship between
schizotypy and conspiracist ideation. The lack of correlation between
negative symptoms and conspiracist ideation is also consistent with
other research, which noted that the negative dimension did not
correlate directly with conspiracist ideation, although it did correlate
indirectly (see Denovan et al., 2020). Some lines of research proposed
that these types of beliefs were part of a “healthy schizotypy” because
they did not generate any subjective discomfort and did not interfere
with the emotional well-being of the patient (see McCreery and Claridge,
2002; Goulding, 2004, 2005). However, this idea of “healthy schizotypy”
is controversial and is not accepted by all mental health professionals
because it challenges the predominant model of the psychotic phenotype
(see Chabrol and Raynal, 2018 for a review).

The fourth question is probably the most complex. If the psychotic
phenotype assumes that attenuated symptoms of psychosis in the
general population represent a risk to people’s mental health (see Shapiro
et al., 2019), to what extent conspiracist ideation would also constitute
a psychopathological risk should also be discussed. Sticking to the results
of this research, the means of conspiracist ideation (CI) obtained among
the three groups present a quantitative degradation that is compatible
with the continuum model of psychosis and psychotic phenotype. For
example, the means in Figs. 2 and 3 clearly show a decreasing trend in CI
scale values as participants do not suffer from any psychiatric disorder.
This supports the supposition that conspiracist ideation may be an
includable psychopathological risk within the psychosis spectrum.

However, simple interaction effects between patients (pretest con-
spiracist ideation) and participants with no history (posttest conspiracist
ideation) showed no significant differences. This does not detract from
the decreasing trend observed in Figs. 2 and 3. Moreover, this result
warns that the conspiracist ideation scores of the healthy participants
reached posttest levels similar to the levels obtained by the participants
with schizophrenia. Does this mean that CI levels after the 132 days of
social-health restrictions increased in the healthy subjects to psycho-
pathological or clinically-significant levels? This research provides the
first evidence that GCBS scale scores greater than 49 points could have a
significant clinical impact and be a risk score within attenuated psy-
chotic symptoms. The reason for this interpretation is that it was the
patients with schizophrenia who showed values close to 50, and the
differences between the means 49.21 and 50.90 were not significant (see
Table 6). However, further research is needed to replicate these results
and to expand the sample size used in this investigation.

If CI scores, psychosis-like experiences, and negative symptoms
increased in participants with and without psychiatric histories during
this 132-day period, it is necessary to question whether the restrictions
and municipal confinements performed fostered attenuated psychotic
states in the nonclinical population. Sociopolitical and medical decisions
to prevent the spread of the coronavirus should not impair the quality
of life of individuals and should not promote psychotic conditions in

healthy” subjects. The results indicate that psychotic symptoms and
conspiracist ideation continued to worsen during this period of crisis.
The urgency and necessity of vaccination and community immunization
to remove these restrictions is emphasized.

3.2. Limitations

The main limitation of this research focuses on the following points:
(1) the methodology used was not experimental; (2) the sample size was
not large; and (3) the measurement instruments used were adequate, but
the results may vary if other questionnaires were used; in fact, no in-
struments were used to assess the degree of psychopathological severity
of the patients.

The methodology was not experimental because the direct effects
of the social health restrictions on the study participants could not be
controlled and the distribution of the subjects to the diagnostic groups
was not random. Therefore, it is not possible to state that the cause of the
increase in psychotic symptoms and conspiracist ideation is due to the
social health restrictions. Considering the scores and the results, it is
possible to infer a direct relationship that should be taken into account.
The sample size affects the external validity and the generalizability
of the results. In this case, conclusions about generalizability should be
made cautiously and should be applied mainly to the Spanish- or
Spanish-speaking population. In addition, other Western countries
during these 132 days applied other more severe restrictions, generating
a social and medical context that differs from the Spanish social-health
care panorama. This should be taken into account if the procedures of
this study were to be replicated in the future. Along these lines, it would
be advisable to include larger samples in which social-health factors
were controlled or recorded as covariates. In this study, it was not
possible to expand the sample because no new mental health clinics
were located that wished to collaborate with the research. Access and
follow-up of patients is a complex procedure and is limited to the con-
ditions of the collaborating clinics.

Finally, it is crucial to explain that the tests used presented accept-
able validity and reliability. The MMSSI-2, CAPE-42 and GCBS scales
were chosen because they were open access and their psychometric
properties were excellent. However, in the case of the GCBS, a direct
translation of the English version was used because the official Spanish
adaptation was not available. This suggests that if other scales were used
to measure conspiracist ideation, there may be a variance associated
with the instrument that should be taken into account in future studies.
This variability would be observed in the direct scores of the new
application, which should be compared with the scores of the present
report. Moreover, no structured protocols were used to measure the
severity of psychotic symptoms (e.g., the PANSS scale; see Edgar et al.,
2014). This should also be considered, since the observed differences
could have a distinct variation if patients presented different levels of
symptomatic severity. Nevertheless, in this study the majority of pa-
tients were in a stable episode of psychosis, which means that the
observed differences should be consistent.

4. Conclusions

This research, the results and discussion allow us to highlight the
following conclusions:

(1) Conspiracist ideation and psychotic-like experiences increased
during the 132 days in which COVID-19 social health restrictions
were applied. This increase was significant and especially
worrisome for subjects with and without a psychiatric history.
Surprisingly, patients with schizophrenia showed no significant
variations between pretests and posttests. Specifically, patients
with schizophrenia showed slightly elevated scores for con-
spiracist ideation and a significant reduction in cenesthetic hal-
 lucinations. These significant differences could be explained by
the pharmacological treatment taken by the patients that involved the intake of antipsychotics.

(2) Conspiracist ideation is highly correlated with schizotypy and psychotic-like experiences and correlates slightly with levels of paranoia. Thus, conspiracist ideation is an individually differential variable to be taken into account when assessing psychopathological risk related to psychosis. We found evidence supporting the possibility that conspiracist ideation could be integrated as a complementary attribute of the psychotic phenotype. However, conspiracist ideation was not correlated with negative symptoms of psychosis. A positive relationship was only obtained for positive symptoms of the psychotic phenotype.

(3) Patients with schizophrenia tend to have higher scores on the conspiracist ideation scale than the other subject groups. This tendency is also observed in the scores for psychotic-like experiences and the other variables. Thus, the measurement of conspiracist ideation also has a quantitative degradation that can be extrapolated to the psychosis continuum (see Figs. 2 and 3). However, this does not mean that it constitutes a severe psychopathological symptom, as it also occurs in milder subjects. Further studies are needed to confirm how to discriminate the threshold between clinical and subclinical scores.

Ultimately, this research contributes to the scientific literature because it provides evidence of the relationship between schizophrenia and conspiracist ideation as an attribute to be taken into account within the spectrum of psychosis.

Ethics approval and consent to participate

The author of this manuscript declares that this research was reviewed and favorably evaluated by the Committee of Ethical Guarantees of Ramon Llull University. Likewise, the author declares that all data collected from this study were anonymous and were blinded (including data related to the clinics and psychiatric centers that participated in this research). The procedures of this study adhere to the Spanish Government Data Protection Act 15/1999 and the Declaration of Helsinki of 1975, revised in 2013.

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Concerning preregistration

This study was not preregistered.

Declaration of competing interest

The author confirms that there are no known conflicts of interest associated with this publication.

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Appendix

Appendix A: Tests of Normality

Table A1

Appendix A. Tests of normality using Shapiro-Wilk coefficient.

| DV                  | Pretests | With a psychiatric history | With no psychiatric history | Posttests | With a psychiatric history | With no history |
|---------------------|----------|-----------------------------|-----------------------------|----------|-----------------------------|-----------------|
|                     | Patients | S   | p   | S   | p   | S   | p   | S   | p   |
| CI                  | 0.969    | 0.250 | 0.964 | 0.199 | 0.968 | 0.335 | 0.957 | 0.144 | 0.959 | 0.123 | 0.975 | 0.539 |
| Ez                  | 0.971    | 0.404 | 0.972 | 0.365 | 0.962 | 0.213 | 0.967 | 0.302 | 0.970 | 0.323 | 0.970 | 0.277 |
| Pa                  | 0.960    | 0.180 | 0.972 | 0.364 | 0.978 | 0.632 | 0.968 | 0.337 | 0.980 | 0.640 | 0.990 | 0.971 |
| Pva                 | 0.958    | 0.150 | 0.967 | 0.255 | 0.973 | 0.462 | 0.970 | 0.381 | 0.957 | 0.104 | 0.960 | 0.176 |
| Pt                  | 0.981    | 0.730 | 0.973 | 0.410 | 0.984 | 0.851 | 0.986 | 0.899 | 0.963 | 0.180 | 0.961 | 0.193 |
| Pc                  | 0.966    | 0.278 | 0.974 | 0.440 | 0.965 | 0.255 | 0.982 | 0.769 | 0.961 | 0.154 | 0.961 | 0.196 |
| Po                  | 0.953    | 0.102 | 0.959 | 0.130 | 0.970 | 0.276 | 0.963 | 0.220 | 0.967 | 0.242 | 0.966 | 0.278 |
| Pd                  | 0.985    | 0.861 | 0.973 | 0.387 | 0.966 | 0.286 | 0.967 | 0.292 | 0.969 | 0.284 | 0.984 | 0.829 |
| Nd                  | 0.956    | 0.136 | 0.979 | 0.602 | 0.966 | 0.280 | 0.965 | 0.263 | 0.982 | 0.719 | 0.971 | 0.405 |

Note: DV = Dependent variables; S = Shapiro-Wilks coefficient; p = Probability that data fit the statistical normality; CI = Conspiracist ideation; Ez = Schizotypy; Pa = Paranoia; Pva = Anomalous Visual/Auditory Perceptions; Pt = Anomalous Tactile Perceptions; Po = Anomalous Olfactory Perceptions; Pc = Anomalous Synesthetic Perceptions; Pd = Positive Dimension; Nd = Negative Dimension.

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