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# Personal Beliefs about Illness Questionnaire-Revised (PBIQ-R): Spanish adaptation in a clinical sample with psychotic disorders

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## Abstract

**Background:** The way people with psychosis psychologically adapt and manage the diagnosis of such a mental disorder has been considered a key factor that contributes to the emergence and aggravation of emotional problems. These beliefs about illness can be very important due to their possible association with stigma and its implications in terms of loss of roles and social status. Given the importance of these personal beliefs about the specific diagnosis of psychosis, the Personal Beliefs about Illness Questionnaire (PBIQ) and PBIQ-R have been developed.

**Aims:** The present study aims to explore the psychometric characteristics of the Spanish version of the PBIQ-R in a sample of patients with a diagnosis of psychosis-related disorders.

**Method:** Participants were 155 patients (54.8% male) of the Public Health Service in Andalusia (Spain). Those who consented to participate filled in the PBIQ-R, the Social Comparison Scale, and the PHQ-9 and GAD-7 to measure emotional symptoms.

**Results:** All dimensions showed adequate internal consistency values: Cronbach's alpha extends between .81 and .88; and McDonald's omega ranges between .87 and .92. The temporal reliability for an interval of 3–4 weeks was high. The correlations between the PBIQ-R dimensions and the other variables included in the study were significant and in the expected direction. The factor analysis of the principal components of the PBIQ-R dimensions revealed a single factor in each of the dimensions that explained 64–74%.

**Conclusions:** The results support the reliability and validity of the Spanish version of the PBIQ-R.

**Keywords:** Assessment; Personal Beliefs about Illness Questionnaire; psychometric characteristics; psychotic disorders

## Introduction

Several studies have shown the importance of emotional distress in people diagnosed with psychotic disorders and its co-morbidity with anxiety disorders (Achim *et al.*, 2011; Pavlova *et al.*, 2015), depressive disorders (Acosta *et al.*, 2013; Birchwood *et al.*, 1993, 2005, 2007; Buckley *et al.*, 2009), and post-traumatic disorders (McGorry, 1991). This symptomatology dramatically affects these patients' quality of life, and therefore it is of great interest to investigate the factors that may be involved in the emergence and course of this

symptomatology. Beliefs regarding the diagnoses and their possible implications for loss of social roles and status can also be critical to the evolution and recovery of people affected.

Previous studies have suggested that one pivotal factor that contributes to the emergence and aggravation of emotional problems in people with psychosis is how they psychologically adapt and manage the diagnosis of such a mental disorder (Birchwood *et al.*, 1998, 2007; Jackson and Iqbal, 2000; Jackson *et al.*, 2009; Ropaj *et al.*, 2021). Indeed, the psychological adaptation and management of the diagnosis plays an important role in several models aimed at explaining psychotic disorders and their associated stigma, as in some cases the disease has relevant negative implications in terms of loss of roles and social status (Birchwood *et al.*, 2005; Pyle *et al.*, 2015; Rooke and Birchwood, 1998).

Among these explicative models, the social comparison theory (SCT; Festinger, 1954; see also Gilbert, 1992) constitutes a theoretical framework of interest for understanding the processes that explain the impact of the psychosis diagnosis on one's identity and the perception of one's social status. According to the SCT, people evaluate their abilities and determine their own social status by comparing themselves with others. Previous studies and clinical observation suggest that the common social comparisons psychotic people make are feeling not being like others and therefore not fitting into groups in which they have previously been integrated, which is associated with distancing from social groups and loss of support, increasing the likelihood of marginalization (Birchwood *et al.*, 2007; McCarthy and Morina, 2020).

Given the importance of these personal beliefs about the specific diagnosis of psychosis, Birchwood and colleagues (1993) developed the Personal Beliefs about Illness Questionnaire (PBIQ). This instrument has recently been revised and refined following the SCT framework to assess five dimensions of these personal beliefs that are associated with both stigma and social rank: loss, entrapment, control, social marginalization, and shame (PBIQ-R: Birchwood *et al.*, 2012). Unlike the IPQ, which is based on the Self Regulation Model (Leventhal *et al.*, 1984) and focuses on beliefs about negative consequences and the perception of control, the PBIQ-R is more based on the theory of stigma (Estroff, 1989) and places the emphasis, rather than on control of the disorder *per se*, on the perceived implication of a stigmatizing disorder on a person's social rank and status.

However, although the psychometric characteristics of the PBIQ-R original English version show adequate reliability and validity in patients with a first episode of psychosis, confirming the factorial structure of the proposed dimensions, there is no previous research on its use in the Spanish context. In response, the present study aims to explore the psychometric characteristics of the Spanish version of the PBIQ-R in a sample of patients with a diagnosis of psychosis-related disorders treated in the facilities of the Andalusian Public Health Service. In addition, this study extends the original validation of the instrument by providing new data on its psychometric properties in a more diverse sample in terms of age and evolution of their mental disorders. The inclusion of a sample with a wider age range was considered of interest to provide a validated instrument that can explore how changes in beliefs evolve over time.

The stigmatizing view evaluated in the PBIQ-R, which can affect social rank and status, is associated with higher levels of depression and anxiety. Therefore, a positive significant relationship between the scores on the PBIQ-R and those on the depression (PHQ9) and anxiety (GAD-7) scales can be expected. However, as they are different constructs, correlations will be moderate, as observed in the study by Birchwood *et al.* (2012), where significant correlations observed were between .34 and .61. The stigmatizing view evaluated by the PBIQ-R assumes a negative impact on the perception of one's own status and rank, and therefore, moderately significant negative correlations on the Social Comparison Scale (SCS) can be expected, as they are also different constructs. This, too, is shown by the results of Birchwood *et al.* (2012), with correlations ranging between .47 and .59.

## Method

### Participants

Participants were 155 out-patients (54.8% male) of the Public Health Service in Andalusia with a diagnosis of schizophrenia or related disorder according to the ICD-10 criteria (WHO, 1992): 48 with schizophrenia (F20), 32 with other psychotic disorder (F28), 30 with bipolar disorder (F31), 16 with delusional disorders (F22), 14 with schizoaffective disorders (F25), 10 with brief psychotic disorder (F23), and five with schizotypal disorder (F21). Their age ranged between 18 and 65 years old ( $M=43.51$ ;  $SD=12.48$ ), and between 13 and 48 years old for age at diagnosis ( $M=25.75$ ;  $SD=7.77$ ). Their years of evolution ranged between 0 and 47 ( $M=17.77$ ;  $SD=12.51$ ). Most of them were single (75.5% vs 15.5% married vs 9% separated or divorced). Also, most of them had a secondary school certificate or professional training (54.2% vs 36.8% university grade vs 9% primary school certificate). However, only 25.2% of them were employed (31.6% unemployed vs 18.7% students vs 20% pensioner vs 4.5% homemaker). All of them were in formal mental health treatment at the Andalusian Public Health System's Community Mental Health Units located in urban areas. As exclusion criteria, the following were considered: (1) severe organic disease and (2) abuse or dependence on toxic substances.

### Measures

#### *Personal Beliefs about Illness Questionnaire-Revised (PBIQ-R; Birchwood et al., 2012)*

This revised version consists of 20 items grouped into five dimensions covering the self-assessment that people make about their own psychotic disorder: shame (e.g. 'I am embarrassed by my illness'), loss (e.g. 'My illness stops me doing things I want to do'), entrapment (e.g. 'My illness stops me getting on with things I want to do'), control over illness (e.g. 'I am intimidated by my illness'), and social marginalization/group fit (e.g. 'I feel excluded because of my illness'). Each dimension is measured with four Likert-scale items (response categories range from 1 'completely disagree' to 4 'completely agree'). The questionnaire provides a score for each dimension that ranges from 4 to 16, where higher scores representing higher stigma and a lower social rank. The scale is not designed to provide an overall composite score. Its psychometric properties will be discussed in the following sections.

#### *Social Comparison Scale (SCS; Allan and Gilbert, 1995)*

Following the Social Rank Theory (Gilbert, 2000), this scale consists of 11 items using bipolar constructs rated from 1 to 10, which measure how people perceive and rank themselves in comparison with others according to three dimensions (e.g. 'In comparison to others, I feel...'): attractiveness (e.g. 'unattractive-more attractive'), adaptation to the group (e.g. 'insider-outsider'), and their social rank (e.g. 'inferior-superior'). Lower scores represent feelings of inferiority and low rank self-perceptions. Cronbach's alpha in our sample was .92 and omega .93.

#### *Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001)*

We used the Spanish version (Vázquez *et al.*, 2014) of this 9-item self-report measure which is used to assess depression severity and criteria for a major depressive episode. Particularly, this questionnaire asks about the frequency in which symptoms of depression have been experienced during the last two weeks (e.g. 'little interest or pleasure in doing things'). Response anchors range temporally from 0 ('not at all') to 3 ('nearly every day'), and therefore the questionnaire provides a composite overall score (ranging from 0 to 27) that determines the severity of depressive symptoms: no depressive symptoms (0–4), mild (5–9),

moderate (10–14), moderate-severe (15–19), and severe or major (20–27). Cronbach's alpha in our sample was .83 and omega was .87.

#### *Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006)*

We used the Spanish version (García-Campayo *et al.*, 2010) of this 7-item self-report measure which is used to assess the frequency in which people experience symptoms of general anxiety during the last two weeks (e.g. 'trouble relaxing'). Response anchors range temporally from 0 ('not at all') to 3 ('nearly every day'), and therefore the questionnaire provides a composite overall score (ranging from 0 to 21) that indicates the severity of anxiety symptoms: no anxiety symptoms (0–4), mild (5–9), moderate (10–14), and severe (15–21). Cronbach's alpha in our sample was .89 and omega was .92.

#### **Procedure**

Regarding the PIBQ-R, after acquiring authorization from the authors for its adaptation, it was followed by a forward-back translation procedure: (1) two independent translations were made from English to Spanish, (2) both translations in Spanish were compared, agreeing on the terms in which differences were observed by taking into account the terminology used in the scientific literature on first episodes of psychosis, (3) this final Spanish version was sent for translation into English by an independent translator, (4) this English version was compared with the original English version, agreeing on those terms and aspects in which minor differences in nuances were observed, and (5) the fidelity of this final English version was reviewed and confirmed by one of the authors of the original English scale. The type of equivalence used has been semantic (Behling and Law, 2000).

Data collection was carried out during routine evaluations of people who met the inclusion criteria: (1) being diagnosed of psychosis (F20–F31 according to ICD-10 criteria) in a first interview with their assigned clinical psychologist or psychiatrist in the Community Mental Health Unit; (2) being aged between 18 and 65 years old; and (3) not presenting organic mental problems. All participants voluntarily accepted to participate in the study and signed the written consent after a research assistant explained them the nature and goal of the study. This research assistant was present during the completion of the evaluation instruments to explain how to complete them and solve problems. In that sense, we must mention that, due to practical reasons, only the first 40 participants completed all instruments (PBIQ-R, PHQ-9, GAD-7 and SCS), the next 40 participants completed the PBIQ-R and the SCS, and the remained 70 participants completed just the PBIQ-R. Furthermore, we randomly selected 30 participants to participate in a follow-up session 3–4 weeks later to complete the PBIQ-R again, and explore its test–re-test reliability.

#### **Statistical analysis**

We analysed data using the statistical package SPSS (version 22). First, we conducted descriptive analyses (means and standard deviations), checked the internal consistency of the scales using both Cronbach's alpha and McDonald's omega coefficients, and calculated the PBIQ-R temporal reliability using the intraclass correlation coefficient (ICC). Then we explored the validity of the PBIQ-R. Concurrent validity was explored using Pearson's *r* correlation between the PBIQ-R and the other variables included in our study: social comparison (SCS), depression (PHQ-9) and anxiety (GAD-7). Following the recommendations from George and Mallery (2003), the Cronbach coefficient and omega were valued as follows:  $\geq .9$ , excellent;  $\geq .8$ , good;  $\geq .7$ , acceptable;  $\geq .6$ , questionable;  $\geq .5$ , poor; and  $\leq .5$ , not acceptable. Construct validity was examined by principal component analysis for each of the PBIQ-R dimensions

**Table 1.** Descriptive statistics of the PBIQ-R items and dimensions ( $N=155$ )

|                 | Minimum | Maximum | Mean | SD   |
|-----------------|---------|---------|------|------|
| PBIQ1           | 1       | 4       | 2.45 | 1.10 |
| PBIQ2           | 1       | 4       | 2.14 | 1.02 |
| PBIQ3           | 1       | 4       | 2.10 | 1.03 |
| PBIQ4           | 1       | 4       | 2.16 | 1.09 |
| PBIQ5           | 1       | 4       | 2.28 | 1.08 |
| PBIQ6           | 1       | 4       | 1.57 | .93  |
| PBIQ7           | 1       | 4       | 2.05 | 1.05 |
| PBIQ8           | 1       | 4       | 2.21 | 1.09 |
| PBIQ9           | 1       | 4       | 2.28 | 1.04 |
| PBIQ10          | 1       | 4       | 2.04 | 1.04 |
| PBIQ11          | 1       | 4       | 2.17 | 1.03 |
| PBIQ12          | 1       | 4       | 2.05 | 1.07 |
| PBIQ13          | 1       | 4       | 2.09 | 1.03 |
| PBIQ14          | 1       | 4       | 2.24 | 1.06 |
| PBIQ15          | 1       | 4       | 2.05 | 1.02 |
| PBIQ16          | 1       | 4       | 1.99 | 1.02 |
| PBIQ17          | 1       | 4       | 2.03 | 1.00 |
| PBIQ18          | 1       | 4       | 2.26 | 1.09 |
| PBIQ19          | 1       | 4       | 2.27 | 1.02 |
| PBIQ20          | 1       | 4       | 2.02 | .98  |
| Loss            | 4       | 16      | 8.83 | 3.38 |
| Control         | 4       | 16      | 8.43 | 3.31 |
| Entrapment      | 4       | 16      | 8.88 | 3.65 |
| Marginalization | 4       | 16      | 7.79 | 3.32 |
| Shame           | 4       | 16      | 8.54 | 3.48 |

and by scree test graphs (as it does not provide a composite overall score but rather scores in several constructs involved in the personal beliefs in relation to psychosis).

## Results

### *Descriptive statistics, internal consistency and temporal reliability*

Table 1 presents mean scores and standard deviations for each PBIQ-R item. Mean scores ranged between 1.57 (item 6) and 2.45 (item 1). Regarding the theoretical dimensions, participants scored higher in the dimension ‘loss’ (8.83) and lower in ‘social marginalization’ (7.79). Also, as can be seen in Table 2, all dimensions showed adequate internal consistency values: Cronbach’s alpha ranged between .81 (‘control’) and .88 (‘entrapment’); McDonald’s omega ranged between .87 (‘control’) and .92 (‘entrapment’). Finally, the temporal reliability (i.e. test–retest reliability) for an interval of 3–4 weeks was high as the ICCs indicated strong correlations ranging between .77 (‘loss’) and .89 (‘shame’) (see Table 2).

### *Validity and factor analysis*

Regarding the PBIQ-R concurrent validity, the correlations between the PBIQ-R dimensions and the other variables included in the study were significant and in the expected direction (see Table 2). Higher scores on the belief dimensions were related to lower scores on the social comparison dimensions (ranging from  $r=-.27$  between ‘social marginalization’ and ‘attractiveness’, to  $r=-.47$  between ‘entrapment’ and ‘group fit’). In other words, having more negative beliefs about the psychotic disorder is associated with worse self-assessments in different areas when people compare themselves with others. That is, the worse they perceived themselves in different areas compared with others, the higher scores they presented in negative beliefs about their disorder. In addition, higher scores in the negative beliefs about

**Table 2.** Reliability and bivariate correlations of the PBIQ-R

|  | Shame  | Loss   | Entrapment | Control | Social marginalization |
|--|--------|--------|------------|---------|------------------------|
| No. of items                                       | 4      | 4      | 4          | 4       | 4                      |
| Mean inter-item correlations                       | .61    | .52    | .65        | .52     | .57                    |
| Cronbach's alpha ( $N=155$ )                       | .86    | .81    | .88        | .81     | .84                    |
| Omega coefficients                                 | .91    | .88    | .92        | .88     | .89                    |
| Test-retest reliability ICC<br>( $n=30$ ; 4 weeks) | .89    | .77    | .85        | .85     | .88                    |
| <b>Bivariate correlations</b>                      |        |        |            |         |                        |
| Shame  | —      |        |            |         |                        |
| Loss   | .69**  | —      |            |         |                        |
| Entrapment   | .75**  | .88**  | —          |         |                        |
| Control  | .65**  | .76**  | .79**      | —       |                        |
| Social marginalization                             | .80**  | .74**  | .78**      | .66**   | —                      |
| PHQ-9 ( $n=40$ )                                   | .58**  | .33*   | .51**      | .33*    | .50**                  |
| GAD-7 ( $n=40$ )                                   | .69**  | .49**  | .64**      | .53**   | .66**                  |
| SCS-Total ( $n=80$ )                               | -.45** | -.45** | -.46**     | -.42**  | -.42**                 |
| SCS-Rank   | -.45** | -.40** | -.43**     | -.36**  | -.39**                 |
| SCS-Group fit                                      | -.42** | -.46** | -.47**     | -.42**  | -.45**                 |
| SCS-Attractiveness                                 | -.31** | -.31** | -.30**     | -.33**  | -.27*                  |

\* $p < .05$ ; \*\* $p < .01$ .**Table 3.** Exploratory factor analyses for the theoretical dimensions ( $N=155$ )

| PBIQ-R                 | Eigenvalue | % variance | Factor loading range |
|------------------------|------------|------------|----------------------|
| Shame                  | 2.6        | 64         | 77–82                |
| Loss                   | 2.5        | 64         | 76–83                |
| Entrapment             | 2.9        | 74         | 83–90                |
| Control                | 2.7        | 68         | 68–89                |
| Social marginalization | 2.8        | 71         | 81–87                |

psychosis are associated with higher severity of both depressive symptoms (correlations ranging between .33 and .58) and anxiety symptoms (correlations ranging between .49 and .69).

Finally, as can be seen in Table 3, the principal component analysis of the PBIQ-R revealed a single factor in each of the dimensions that explained 64% of the variance in the dimension 'shame' (eigenvalue=2.4, item loadings ranging from .77 to .82; see also Table 4); 64% in 'loss' (eigenvalue=2.5, item loadings ranging from .76 to .83); 74% in 'entrapment' (eigenvalue=2.9, item loadings ranging from .83 to .90); 68% in 'control' (eigenvalue=2.7, item loadings ranging from .68 to .89); and 71% in 'marginalization' (eigenvalue=2.8, item loadings ranging from .81 to .87), respectively.

## Discussion

This study aimed to validate the Spanish translation of the PBIQ-R in people with psychosis and related disorders. In addition, this study contributes to the original validation of the instrument by providing new data on its psychometric properties in a sample with a wider age range enabling evolution of their mental disorders to be visualized.

Overall, results support the reliability and validity of the instrument. Regarding the reliability of the instrument, the Cronbach's alpha coefficients for each of the five dimensions were adequate, with values ranging between .81 and .88, slightly above that observed in the UK sample (ranging between .69 and .81 in Birchwood *et al.*, 2012). Moreover, the omega coefficients, which are considered less biased than Cronbach's alphas (Dunn *et al.*, 2014), offered additional evidence in favour of the scale's internal consistency. Also, results support the temporal reliability of

**Table 4.** Factor loading of each item on the factors ( $N=155$ )

|        | Loss | Control | Entrapment | Social marginalization | Shame |
|--------|------|---------|------------|------------------------|-------|
| PBIQ1  | .77  |         |            |                        |       |
| PBIQ2  |      | .81     |            |                        |       |
| PBIQ3  |      | .80     |            |                        |       |
| PBIQ4  |      | .83     |            |                        |       |
| PBIQ5  |      |         | .83        |                        |       |
| PBIQ6  |      |         |            | .68                    |       |
| PBIQ7  |      |         |            | .88                    |       |
| PBIQ8  |      |         |            |                        | .87   |
| PBIQ9  | .80  |         |            |                        |       |
| PBIQ10 |      |         |            |                        | .81   |
| PBIQ11 |      |         |            | .84                    |       |
| PBIQ12 | .81  |         |            |                        |       |
| PBIQ13 |      |         | .86        |                        |       |
| PBIQ14 |      |         | .90        |                        |       |
| PBIQ15 | .82  |         |            |                        |       |
| PBIQ16 |      |         |            | .89                    |       |
| PBIQ17 |      | .76     |            |                        |       |
| PBIQ18 |      |         | .85        |                        |       |
| PBIQ19 |      |         |            |                        | .86   |
| PBIQ20 |      |         |            |                        | .82   |

the five dimensions, with ICC correlations between .78 and .89 for an interval of 3–4 weeks. These results are very similar to those obtained by Birchwood *et al.* (2012) using an interval of only 1 week, except for ‘loss’, which in the original study presents values slightly below the .70 recommended for the test–retest. In any case, this dimension is the one with the lowest reliability values in both studies.

In this regard, differences between samples may account for such results. Participants in the UK sample were younger and the period of evolution of their psychotic disorder was shorter compared with participants in our sample, which could lead to greater consistency in the Spanish participants’ beliefs because their longer period of exposure to the psychotic diagnosis. In addition, our study extends the findings of the original study because it also includes the omega coefficients.

Regarding the validity of the scale, concurrent validity is supported by the significant, albeit modest, correlation observed between the five dimensions of the PBIQ-R and the other variables included in this study. In the case of the correlations between PBIQ-R dimensions and the SCS dimensions, the values are similar to those observed by Birchwood *et al.* (2012): ranging between  $-.42$  and  $-.46$  in the Spanish sample, compared with correlations between  $-.39$  and  $-.55$  in the UK sample. In that sense, the loss of status and the perception of being an outsider (evaluated with the SCS), are significantly associated with more dysfunctional beliefs. These results indicate that, although both the PBIQ-R and the SCS instruments are based on social comparison and social rank theories, the PBIQ-R measures specific perceptions about the illness that capture how people who are faced with a psychosis diagnosis adapt to such a diagnosis and anticipate its consequences, including the emotional impact of psychotic disorders. In this sense, the results obtained regarding the correlations with depression and anxiety with an effect size between medium and large (Cohen, 1992), also confirm the validity of the scale.

Furthermore, in line with previous studies, the relationship of beliefs with emotional disturbances is confirmed by the correlation with symptoms of depression and anxiety (Acosta *et al.*, 2013; Birchwood *et al.*, 2012). For example, Iqbal *et al.* (2000), although using another instrument such as the Calgary Depression Scale, found moderate correlations

between dysfunctional beliefs and depression, similar to our study. They concluded that the mechanisms of post-psychotic depression depend on a great extent to the evaluations that people make regarding the implications of psychosis for themselves in terms of loss, marginalization and entrapment.

Finally, our factor analyses confirm the proposed original structure composed by five dimensions (Birchwood *et al.*, 2012). Likewise, the only factor in each dimension is confirmed by scree test graphs.

Despite our study replicating and extending the original validation of the scale, further studies could use larger samples to perform more robust analyses (e.g. testing for metric invariance among sex or other demographics or CFA), as well as assess other characteristics of the scale, as sensitiveness to change, known-groups validity, or predictive validity. In addition, future studies should include longer time lags between the test–retest to check the temporal reliability and explore changes over time depending on the severity of the disorder. In a similar vein, our design does not allow us to establish a causal relationship between personal beliefs and emotional disturbances, and therefore future studies should include longitudinal data collection to infer causality.

Summarizing, this study supports the validation of the PBIQ-R in Spanish, providing data that support its reliability and validity in a sample with psychotic disorders. In that sense, this questionnaire, which is not time-consuming, is easy to administer and allows the evaluation of negative beliefs, facilitating a more precise and comprehensive knowledge of people with first episodes of psychosis. It confirms the dimensional structure proposed in the original scale and provides professionals with an instrument that evaluates several dimensions of patients' personal negative beliefs about their illness. Moreover, given the relevance of personal beliefs about disorders for the successful involvement of patients in their treatment, it is important to have an instrument that allows mental health workers addressing such patient beliefs. Indeed, the assessment of negative beliefs is important in healthcare practice because of their prognostic value and relation with increased risk of suicide (Acosta *et al.*, 2013; Jackson *et al.*, 2009; Lobban *et al.*, 2004).

**Data availability statement.** Research data are not shared, as there is no authorization from the institution.

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**Author contributions.** **Antonio Vazquez Morejón:** Conceptualization (lead), Data curation (equal), Formal analysis (equal), Methodology (equal), Project administration (equal), Resources (equal), Software (equal), Supervision (equal), Validation (equal), Visualization (equal), Writing – original draft (lead), Writing – review & editing (equal); **Chris Jackson:** Conceptualization (equal), Formal analysis (equal), Methodology (equal), Supervision (equal), Validation (equal), Writing – original draft (equal), Writing – review & editing (equal); **Raquel VazquezMorejon:** Conceptualization (equal), Formal analysis (equal), Methodology (equal), Resources (equal), Supervision (equal), Validation (equal), Writing – original draft (equal), Writing – review & editing (equal); **José María León-Pérez:** Conceptualization (equal), Formal analysis (equal), Methodology (equal), Validation (equal), Writing – review & editing (equal).

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**Conflict of interest.** The authors declare none.

**Ethical standards.** This study was conducted according to the guidelines of the Declaration of Helsinki and subsequent revisions, and approved by the Ethics Committee of Virgen Macarena-Virgen del Rocío University Hospital (protocol code 1384-N-19, 13/07/2020).

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