A meta-analysis and meta-regression analysis of the global prevalence of obsessive-compulsive personality disorder

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ABSTRACT

There is a relative dearth of research on Obsessive-Compulsive Personality Disorder (OCPD), even if it has been recognized for over 100 years. Thus, the present study aims to review the worldwide prevalence of OCPD in different populations. The search was conducted employing the PubMed database of the US National Library of Medicine and Biblioteca Virtual em Saúde (BVS) to detect available studies showing OCPD prevalence rates. All the prevalence rates were extracted and aggregated through random-effects models. Meta-regression and sensitivity analyses were performed. The final sample was composed of 46 articles, including 89,264 individuals. We found that OCPD reports a high prevalence rate, with 6.5% (95%CI = 4.3–9.1%), and reaching even higher among psychiatric and clinical patients' population. OCPD prevalence has been stable worldwide throughout the past 28 years. There was no gender-related effect, but OCPD prevalence rates may decrease with age increase. There is a need to investigate personality disorders epidemiology based on the recently updated classification systems (i.e., DSM-5 and ICD-11). The present meta-analysis may suggest that the current diagnostic tools may detect OCPD in a cross-sectional assessment but not throughout the life of the person.

1. Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders-fifth edition (“DSM-5”), personality traits may constitute personality disorders (PD) in case of a persistent and inflexible pattern of internal experience and behavior that markedly deviates from the expectations of the individual culture that is present in at least two of the following domains: cognition, affectivity, interpersonal functioning, and impulse control. A PD causes clinically significant suffering and impairments to several areas of an individual's life (e.g., social, professional). It is a persistent disorder that shows a stable pattern, and its appearance usually occurs in adolescence or early adulthood (APA, 2013). PD
prevalence data in the general population were widely unknown until the 90s (Lenzenweger, 2008). The third edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-III) in 1980 included diagnostic criteria and a multiaxial classification system. Also, new diagnostic instruments and structured and semi-structured clinical interviews were proposed. One of the most common PD in the general population is the Obsessive-Compulsive PD (OCPD) (Mancebo et al., 2005; Soeteman et al., 2008): it is associated with a reduction in quality of life, with at least a moderate effect due to the absence at work (Barrett and Byford, 2012). Coid et al. (2006) identified that people with PD were more likely to report unemployment or economic inactivity when compared to people without PD.

Despite the individual and social burden associated with PD, research in epidemiology is currently poor. Also, prevalence rates in different studies are heterogeneous, varying from 4% to 15% in the European and American cross-sectional studies (Coid et al., 2006). These differences can be attributed to different study populations, sampling methods, and diagnostic evaluation methods (Volkert et al., 2018). Ames and Molinari (1994) found 0.5% OCPD prevalence among elderly living in the community. Coid et al. (2006) found an 2.1% OCPD prevalence in a representative sample of individuals living in Great Britain. Jackson and Burgess (2000) found a slightly higher prevalence (3.1%) in a random sample of households in Australia. In other hand, a much higher prevalence of OCPD was found by Chamberlain et al. (2017) among internet users (71.5%). In a stratified sample in Turkey, there was 15.6% of individuals with OCPD (Dereboy et al., 2014).

OCPD is clinically characterized by an individual concern for order, perfectionism, and mental and interpersonal control at the expense of flexibility, openness, and efficiency (Chamberlain et al., 2017). Patients with OCPD strive to achieve perfectionism that interferes in their task completion: the primary goal of an activity or task may go unnoticed because of the great concern with details, rules, lists, order, or schedules (Costa et al., 2005). These individuals are usually reluctant to delegate tasks to team-workers and often focus on poor relevant details (APA, 2019). They may also be excessively dedicated to their working productivity up to the point of excluding their friends and hobbies (Torres et al., 2006). Patients with OCPD usually show rigidity and stubbornness, possibly acting with an excess of awareness, scrupulosity, and inflexibility with regard to ethics, values, and moral issues (Mancebo et al., 2005). It is also described as having difficulty discarding objects even when patients do not report any sentimental bond with the object itself. They also usually save money, bearing the perspective of possible future catastrophes (APA, 2013). In the 10th edition of the International Classification of Diseases (ICD-10), it has been included the Anankastic PD (OCPD), characterized by the presence of feelings of doubt, perfectionism, over consciousness, excessive patterns of verification and concern with details, stubbornness, caution, and rigidity (World Health Organization, 1993).

This meta-analysis study aimed to determine the OCPD prevalence in different populations (general, clinical psychiatric, prison, and student), global regions (Americas, Asia, Europe, and Oceania), and based on different criteria (DSM-III, DSM-IV, DSM-5, and ICD-10).

2. Methodology

2.1. Review guidelines and registration

This study followed the PRISMA statement for the transparent report of systematic reviews and meta-analysis (Moher et al., 2009) and MOOSE guidelines for Meta-analysis Of Observational Studies in Epidemiology (Stroup et al., 2000). Figures 1 and 2 respectively present PRISMA and MOOSE checklists reporting the page of the manuscript in which we considered the item addressed. This study was registered at the Center for Open Science/Open Science Framework (https://osf.io/wnu8t/?view_only=d6433424400b4c6f6858d6cc2b98b0cef).

2.2. Information sources

We employed the PubMed of the US National Library of Medicine and Biblioteca Virtual em Saúde (BVS) databases. We identified all the relevant articles published in English, Portuguese, and Spanish. The last search was performed on November 17th, 2020.

The utilized search key words with Medical Subject Headings (MeSH) were: “("Prevalence"[Mesh]) OR "Epidemiology"[Mesh]) AND "Personality Disorders"[Mesh]) OR "Compulsive Personality Disorder"[Mesh]”, on PubMed and Descritores em Ciências da Saúde (DeCS): “(epidemiologia) OR (prevalência) AND (transtorno da personalidade) OR (transtorno da personalidade compulsiva)” on BVS. The selected articles were processed in two steps.

Step 1. All abstracts were reviewed by the first author and selected on the basis of aiming to describe OCPD prevalence.

Step 2. All abstracts were independently evaluated by two of the authors (first and second) and selected on the base of a consensual agreement on criteria used in Step 1. In case of disagreement, the abstract was evaluated by a third author (last author).

Step 3. The inclusion of the articles was based on a consensual agreement between the first and last authors: 1) original researches about OCPD prevalence were included; 2) studies based on OCPD diagnoses according to ICD (International Classification of Diseases) or DSM (Diagnostic and Statistical Manual of Mental Disorders); 3) studies based on samples from general population or students; 4) studies excluding individuals ≥16 years old; 5) studies in English, Portuguese or Spanish.

The main objective of this study was to analyze OCPD prevalence rates in the general population and students worldwide.

Review of Specialized books. Eight books were considered and reviewed: Diagnostic and Statistical Manual of Mental Disorders (“DSM-5”) (American Psychiatric Association, 2013); Textbook of Psychiatry (Roberts, 2019); Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry (Sadock et al., 2015); Psychodynamic Psychiatry in Clinical Practice, Fifth Edition (Gabbard, 2014); Clínica Psiquiátrica de Bolso (Forlenza and Miguel, 2014); Psiquiatria: Estudos Fundamentais (Meleiro, 2018); Manual de Psiquiatria Clínica (Paraventi and Chaves, 2016); Transtorno da Personalidade (Neto and Cols, 2011).

Contact with experts. Sixteen specialists in the field of PDs from North America, South America, and Europe were contacted via e-mail to include potentially relevant articles that were not found by our search strategy.

Revision of reference list. The reference list of all selected articles in Step 3 was reviewed.

2.3. Data extraction

Data were extracted from the selected (full-text) articles by the first author and reviewed by the last author. All divergencies between the first and last authors were discussed with the second author.
## PRISMA 2009 Checklist

| Section/topic | # | Checklist Item                                                                                                                                                                                                 | Reported on page # |
|---------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| **TITLE**     |   | Identify the report as a systematic review, meta-analysis, or both.                                                                                                                                              | 1                  |
| **ABSTRACT**  |   | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations, conclusions and implications of key findings; systematic review registration number. | 1                  |
| **INTRODUCTION** | | Describe the rationale for the review in the context of what is already known.                                                                                                                                   | 1-2                |
| **METHODS**   |   | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICO).                                                                 | 2                  |
| Protocol and registration | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.                                               | 2                  |
| Eligibility criteria | 6 | Specify study characteristics (e.g., PICO, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.                         | 3                  |
| Information sources | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and data last searched.                                      | 2-4                |
| Search | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.                                                                                     | 2-4                |
| Study selection | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).                                                      | 2-4                |
| Data collection process | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.                                        | 4                  |
| Data items | 11 | List and define all variables for which data were sought (e.g., PICO, funding sources) and any assumptions and simplifications made, Table 2                                                                    |                    |
| Risk of bias in individual studies | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done on the study or outcome level), and how this information is to be used in any data synthesis. | 4                  |
| Summary measures | 13 | State the principal summary measures (e.g., risk ratio, difference in means).                                                                                                                                      | 4                  |
| Synthesis of results | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I²) for each meta-analysis.                                                      | 4                  |

| Section/topic | # | Checklist Item                                                                                                      | Reported on page # |
|---------------|---|---------------------------------------------------------------------------------------------------------------------|--------------------|
| Risk of bias across studies | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).                                                      | Figure 3          |
| Additional analyses | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.                                                                                      | 4                  |
| **RESULTS**   |   |                                                                                                                    |                    |
| Study selection | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.                                                              | Figure 4          |
| Study characteristics | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICO, follow-up period) and provide the citations.                                                                                      |                    |
| Risk of bias within studies | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).                                                                |                    |
| Results of individual studies | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. |                    |
| Synthesis of results | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.                                                              | Figures 5-9       |
| Risk of bias across studies | 22 | Present results of any assessment of risk of bias across studies (see item 15).                                                                                           | Figure 3          |
| Additional analysis | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see item 16]).                                                                                                    |                    |
| **DISCUSSION** | | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).                                               | 10-11              |
| Limitations | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).                                                             | 10                 |
| Conclusions | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research.                                                                                           | 10-11              |
| **FUNDING**   |   | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.                                                                               | N.A.              |

*From: Liberati A, Altman D, Tetzlaff J. The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed.1000097.*
| Item No | Recommendation                                                                 | Reported on Page No |
|---------|-------------------------------------------------------------------------------|---------------------|
|         | Reporting of background should include                                        |                     |
| 1       | Problem definition                                                           | 1                   |
| 2       | Hypothesis statement                                                         | 2                   |
| 3       | Description of study outcome(s)                                               | 3                   |
| 4       | Type of exposure or intervention used                                         | 3                   |
| 5       | Type of study designs used                                                    | 3                   |
| 6       | Study population                                                              | 3                   |
|         | Reporting of search strategy should include                                   |                     |
| 7       | Qualifications of searchers (eg. librarians and investigators)                | 1                   |
| 8       | Search strategy, including time period included in the synthesis and key words| 2-4                 |
| 9       | Effort to include all available studies, including contact with authors       | 3-4                 |
| 10      | Databases and registries searched                                             | 2-4                 |
| 11      | Search software used, name and version, including special features used (eg,  | 3                   |
|         | explosion)                                                                    |                     |
| 12      | Use of hand searching (eg, reference lists of obtained articles)             | 4                   |
| 13      | List of citations located and those excluded, including justification         | Figure 4            |
| 14      | Method of addressing articles published in languages other than English       | 3                   |
| 15      | Method of handling abstracts and unpublished studies                          | 3-4                 |
| 16      | Description of any contact with authors                                        | 4                   |
|         | Reporting of methods should include                                           |                     |
| 17      | Description of relevance or appropriateness of studies assembled for assessing | 4                   |
|         | the hypothesis to be tested                                                   |                     |
| 18      | Rationale for the selection and coding of data (eg, sound clinical principles or | 4                   |
|         | convenience)                                                                  |                     |
| 19      | Documentation of how data were classified and coded (eg, multiple raters, blinding | 4                   |
|         | and interrater reliability)                                                   |                     |
| 20      | Assessment of confounding (eg, comparability of cases and controls in studies where | 4                   |
|         | appropriate)                                                                  |                     |
| 21      | Assessment of study quality, including blindling of quality assessors, stratification | Table 1             |
|         | or regression on possible predictors of study results                         |                     |
| 22      | Assessment of heterogeneity                                                   | Table 4             |
| 23      | Description of statistical methods (eg, complete description of fixed or random effects | 4                   |
|         | models, justification of whether the chosen models account for predictors of study |             |
|         | results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated | Table 4 |                     |
| 24      | Provision of appropriate tables and graphics                                   | Tables 1-4; Figures 1-9 |
|         | Reporting of results should include                                           |                     |
| 25      | Graphic summarizing individual study estimates and overall estimate           | Figures 5           |
| 26      | Table giving descriptive information for each study included                  | Table 2             |
| 27      | Results of sensitivity testing (eg, subgroup analysis)                        | Figures 6-9         |
| 28      | Indication of statistical uncertainty of findings                             | Figures 5-9         |
|         | Reporting of discussion should include                                        |                     |
| 29      | Quantitative assessment of bias (eg, publication bias)                        | Figure 3            |
| 30      | Justification for exclusion (eg, exclusion of non-English language citations) | Figure 4            |
| 31      | Assessment of quality of included studies                                     | Table 1             |
|         | Reporting of conclusions should include                                       |                     |
| 32      | Consideration of alternative explanations for observed results                | 5-5                 |
| 33      | Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review) | 10-11               |
| 34      | Guidelines for future research                                                | 10                  |
| 35      | Disclosure of funding source                                                  | N.A.                |

*From: Stroup DF, Berlin JA, Morton SC, et al, for the Meta-analysis Of Observational Studies in Epidemiology (MOOSE) Group. Meta-analysis of Observational Studies in Epidemiology. A Proposal for Reporting. JAMA, 2000;283(15):2008-2012. doi: 10.1001/jama.283.15.2008.*

Figure 2. MOOSE checklist.
Table 1. Results of the quality assessment.

| Authors                | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Total |
|------------------------|----|----|----|----|----|----|----|----|----|-------|
| Torgersen S et al.     | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Jackson JH et al.      | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Lenzenweger MF et al.  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Goid J et al.          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Samuels J et al.       | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Mike A et al.          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 8     |
| Chamberlain SR et al.  | 1  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 6     |
| Jalenques I et al.     | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Gawda B el at          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Anari Z et al.         | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Nicoletti et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Quirk SE et al.        | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Kayhan F el at         | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Black DW et al.        | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Yılmaz A et al.        | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Dereboy C et al.       | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Sabingoz M et al.      | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Ugur F et al.          | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Kempe S et al.         | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Samuel DB et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Moore EA et al.        | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 8     |
| Coolidge FL et al.     | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 8     |
| Sansoon SA et al.      | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Cheng H et al.         | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Crawford TN et al.     | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Moldin SO et al.       | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 8     |
| Maier W et al.         | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Black DW et al.        | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Aycicegi-Dinn A et al. | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| ECHEBURÚA E et al.     | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Yang M et al.          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Torres AR et al.       | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Larson JO et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Anderluh MB et al.     | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Sinha BK et al.        | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Maggini C et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Moran P et al.         | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Bodlund O et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Ames A et al.          | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Samuels JF et al.      | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Moran P et al.         | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Grant BF et al.        | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| Wongpakaran N et al.   | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 9     |
| HYUN HA J et al.       | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |
| Kulkarni RR et al.     | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 7     |
| Ekelius L. et al.      | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 8     |

| 1 = Yes 0 = No/Unclear |

**JBI Critical Appraisal Checklist for studies reporting prevalence data**

1. Was the sample frame appropriate to address the target population?
2. Were study participants sampled in an appropriate way?
3. Was the sample size adequate?
4. Were the study subjects and the setting described in detail?
5. Was the data analysis conducted with sufficient coverage of the identified sample?
6. Were valid methods used for the identification of the condition?
7. Was the condition measured in a standard, reliable way for all participants?
8. Was there appropriate statistical analysis?
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?
Figure 3. Publication Bias: Results of funnel plot and tests for all studies included in the meta-analysis for OCPD prevalence. Egger’s regression test of funnel plot asymmetry: $t = 2.2603$, $df = 75$, $p$-value $= 0.02671$. Fail-safe N Calculation Using the Orwin Approach: 1 (Average Effect Size: 0.139; Target Effect Size: 0.0695).

Figure 4. Study’s selection flow chart.
| Author, year | Study population | Specific population assessed | Setting | Diagnostic criteria, Scale | Prevalence, N of the OCPD |
|--------------|------------------|-------------------------------|---------|-----------------|-------------------------|
| Torgersen et al. (2001) | N: 2053 Female/Male (F/M): 0.556 Continent: Europe Mean age: 18-65 | N: 2053 F/M: 0.556 | Community | DSM III-R/SCID-II | 2.00% 39 |
| Jackson and Burgess (2000) | N: 10641 F/M: 0.557 Continent: Oceania Mean age: ≥ 18 | N: 10641 F/M: 0.557 | Community | CID-10/IPDE | 3.09% 329 |
| Lenzenweger et al. (2007) | N: 5692 F/M: - Continent: North America Mean age: 16 - 74 | N: 214 F/M: - | Community | DSM-IV/IPDE | 2.40% 5 |
| Coid et al. (2006) | N: 626 F/M: 0.567 Continent: North America Mean age: 18-74 | N: 626 F/M: 0.567 | Community | DSM-IV/SCID-II | 1.90% 13 |
| Samuels et al. (2002) | N: 742 F/M: 0.63 Continent: North America Mean age: 34 - 94 | N: 742 F/M: 0.63 | Community | DSM-IV and CID 10/IPDE | DSM-IV: UP = 1,2 (0.4), WP = 0.9 (0.5); CID-10: UP = 1.1 (0.4), WP = 0.8 (0.4) | DSM-IV N = 9/CID-10 N = 8 |
| Mike et al. (2017) | N: 1630 F/M: 0.55 Continent: North America Mean age: 59,53 ± 2,7 | N: 1630 F/M: 0.55 | Community | DSM-5/SIDP | 2.90% 47 |
| Chamberlain et al. (2017) | N: 1323 F/M: 0.616 Continent: North America/Africa Mean age: 28.5(13.0) | N: 1323 F/M: 0.616 | Community | DSM-5/OPQ | 71.50% 946 |
| Jalenques et al. (2017) | N: 178 F/M: 0.786 Continent: Europe | N - Healthy Comparison Subjects (HCS): 118 Mean age: 46 ± 13.9 F/M: 0.788 | Community | DSM-IV/PDQ-4+ | 6% 7 |
| | | N - Lupus patients: 60 Mean age: 47.5 ± 14 F/M: 0.783 | Ambulatory | DSM-IV/PDQ-4+ | 13% 8 |
| Gawda and Czubak (2017) | N: 1460 F/M: 0.52 Continent: Europe Mean age: 18 - 65 | N: 1460 F/M: 0.52 | Community | DSM-IV/SCID-II | 9.66% 141 |
| Ansari and Fadardi (2016) | N: 110 F/M: - Continent: Asia Mean age: 29.55 | N: 110 F/M: - | Students | DSM-IV/SCID-II | 16.36% 18 |
| Nicoletti et al. (2016) | N: 65 F/M: 0.446 Continent: Europe | N - HCS: 20 Mean age: 65.5 ± 6.0 F/M: 0.5 | Community | DSM-IV/SCID-II and SCID-II-PQ | 10% 2 |
| | | N - Patients with Multiple Systems Atrophy: 15 Mean age: 62.9 ± 7.6 F/M: 0.466 | Ambulatory | DSM-IV/SCID-II and SCID-II-PQ | 13.3% 2 |
| | | N - Patients with Progressive Supranuclear Palsy: 14 Mean age: 69.8 ± 4.4 F/M: 0.428 | Ambulatory | DSM-IV/SCID-II and SCID-II-PQ | 35.7% 5 |
| Quirck et al. (2017) | N: 768 F/M: 1 Continent: Oceania Mean age: ≥ 25 | N - Essential Tremor Patients: 16 Mean age: 70.4 ± 6.4 F/M: 0.375 | Ambulatory | DSM-IV/SCID-II and SCID-II-PQ | 12.5% 2 |
| Kayhan and Ilik (2016) | N: 205 F/M: 0.502 Continent: Europe | N: 768 F/M: 1 | Community | DSM-IV/SCID-II and SCID-II-PQ | 10.30% 77 |
| | | N - HCS: 100 Mean age: 31.18 ± 8.98 F/M: 0.5 | Community | DSM III-R/SCID-II | 8% 8 |
| Black et al. (2015) | N: 579 F/M: - Continent: North America | N - Chronic migraine patients: 105 Mean age: 35.63 ± 11.61 F/M: 0.505 | Ambulatory | DSM III-R/SCID-II | 50.50% 53 |

(continued on next page)
Table 2 (continued)

| Author, year | Study population | Specific population assessed | Setting | Diagnostic criteria, Scale | Prevalence, N of the OCPD |
|--------------|------------------|-----------------------------|---------|---------------------------|---------------------------|
| N - HCS: 91  | Mean age: 49 ± 16 F/M: 0.63 | Community | DSM-IV/SIDP | 3% | 3 |
| N - Patients diagnosed with pathological gambling: 93 Mean age: 49.9 ± 14 F/M: 0.55 | Ambulatory | DSM-IV/SIDP | 10% | 9 |
| Yilmaz et al. (2014) | N: 187 F/M: 0.732 Continent: Europe | N - 1st degree relatives of patients diagnosed with pathological gambling: 395 Mean age: ≥ 18 F/M: 0.63 | Community? | DSM-IV/- | - |
| N - Patients diagnosed with pathological gambling: 93 Mean age: 49.9 ± 14 F/M: 0.55 | Ambulatory | DSM-III-R SCID-II | 6.60% | 6 |
| Dereboy et al. (2014) | N: 774 F/M: 0.59 Continent: Europe Mean age: 18-75 | N - Asthmatic patients: 97 Mean age: 42.7 ± 11.7 F/M: 0.763 | Ambulatory | DSM-IV/CID-10 DIP-Q/TCI | DSM-IV = 14.1% CID-10 = 18.1% DSM-IV = 107 CID-10 = 137 |
| N - Patients diagnosed with pathological gambling: 93 Mean age: 49.9 ± 14 F/M: 0.55 | Ambulatory | DSM-III-R SCID-II | 11.34% | 11 |
| Sahingoz et al. (2013) | N: 146 F/M: 1 Continent: Europe | N: 774 F/M: 0.59 | Community | DSM-IV/SCID-II | 1.40% | 1 |
| Uğuz et al. (2013) | N: 105 F/M: 0.914 Continent: Europe Mean age: 18.8 | N - Polycystic Ovary Syndrome Patient: 73 Mean age: 23.82 ± 4.99 F/M: 1 | Ambulatory | DSM-IV/SCID-II | 8.20% | 6 |
| Moore et al. (2012) | N: 1121 F/M: 0.444 Continent: Oceania | N - Patients with chronic fatigue syndrome: 92 Mean age: 42.5 ± 8.2 F/M: 1 | Ambulatory | DSM-IV/ADP-IV | 8.70% | 8 |
| Samuel and Widiger (2011) | N: 536 F/M: 0.627 Continent: North America Mean age: 18.8 | N - HCS: 73 Mean age: 24.59 ± 4.71 F/M: 1 | Community | DSM-IV/SCID-II | 1.70% | 1 |
| N - HCS: 73 Mean age: 24.59 ± 4.71 F/M: 1 | Community | DSM-IV/SCID-II | 1.40% | 1 |
| N - Lupus patients: 45 Mean age: 39.24 ± 9.91 F/M: 0.933 | Ambulatory | DSM-III/SCID-II | 20.00% | 9 |
| N - patients: 549 Mean age: 39.5 F/M: 0.329 | Ambulatory | DSM-IV/ADP-IV | 35.60% | 195 |
| Crawford et al. (2005) | N: 1360 F/M: - Continent: North America Mean age: - | N - HCS: 26 Mean age: 28.9 ± 7.2 F/M: 1 | Community | DSM-IV/SCID-II | 0% | 0 |
| Author, year       | Study population | Specific population assessed | Setting                        | Diagnostic criteria, Scale | Prevalence, N of the OCPD |
|-------------------|-----------------|-----------------------------|--------------------------------|----------------------------|---------------------------|
| Moldin et al. (1994) | N: 302          | F/M: 0.473                  | Ambulatory                    | DSM-IV/SCID-II             | 18% 6                     |
|                   |                 |                             |                               |                            |                           |
| Maier et al. (1992) | N: 452          | F/M: 0.515                  | Students                      | CID-10/PDQ-4+ and IPDE     | 21.84% 78                 |
|                   |                 |                             |                               |                            |                           |
| Black et al. (1993) | N: 65           | F/M: 0.60                   | Community                     | DSM-IV/CIC-SR and SCID-II  |                           |
|                   |                 |                             |                               | CIC-SR = 1.4% e SCID II = 4.7% |                           |
|                   |                 |                             |                               | CIC-SR = 9 e SCID II = 30   |                           |
|                   |                 |                             |                               |                            |                           |
| Aycicegi-Dinn et al. (2009) | N: 117    | F/M: 0.683                  | Community                     | DSM-III/SCID-II            | 2.20% 10                  |
|                   |                 |                             |                               |                            |                           |
| Echeburúa et al. (2007) | N: 381     | F/M: 0.417                  | Community                     | DSM-III/SCID-II            | 6.10% 2                    |
|                   |                 |                             |                               |                            |                           |
| Yang et al. (2007)  | N: 1014         | F/M: 0.401                  | Ambulatory                    | DSM-IV/PDQ-4+ and MCMII    | 12% 19                    |
|                   |                 |                             |                               |                            |                           |
| Torres et al. (2006) | N: 8399        | F/M: 0.467                  | Community                     | DSM-IV/SCID-II             | 1.80% 10                  |
|                   |                 |                             |                               |                            |                           |
| Larsson and Hellzen (2004) | N: 29       | F/M: 1                      | Ambulatory                    | DSM-IV/SCID-II             | 28.60% 31                 |
|                   |                 |                             |                               |                            |                           |
| Anderluh et al. (2003) | N: 100        | F/M: 1                      | Community                     | DSM-IV/DIP-Q               | 10% 1                     |
|                   |                 |                             |                               |                            |                           |
| Sinha and Watson (2001) | N: 293       | F/M: 0.662                  | Ambulatory                    | CID-10/MOCI                | 61% 27                    |
|                   |                 |                             |                               |                            |                           |
| Maggini et al. (2000) | N: 2889        | F/M: 0.489                  | Students                      | DSM-III/R/CATI and MCMII- II and MMPI-PD | Women: MCMII:0.51%/MMPI-PD:0.51%/CATI:0.51%/Men: MCMII:0.51% | 46% 13 |
|                   |                 |                             |                               |                            |                           |

(continued on next page)
| Author, year | Study population | Specific population assessed | Setting | Diagnostic criteria, Scale | Prevalence, N of the OCPD |
|--------------|------------------|-----------------------------|---------|---------------------------|---------------------------|
| Continent: Europe<br>Mean age: 17 ± 0.4 | | | | | |
| | N: 2889<br>F/M: 0.489 | Students<br>DSM-III/SCID-II | | | 30.50%<br>880 |
| Moran et al. (2000) | N: 303<br>F/M: 0.660 | Ambulatory<br>CID-10 and DSM-IV/SAP and IPDE | | | CID-10 = 7.9%,<br>DSM IV = 6.3%,<br>CID-10 = 24,<br>DSM-IV = 19 |
| Bodlund et al. (1998) | N: 587<br>F/M: 0.453 | Community<br>DSM-IV/DIP-Q | | | 9%<br>13 |
| | N - HCS: 139<br>Mean age: 28.0 (SD = 8.1)<br>F/M: 0.690 | | | | |
| | N - General psychiatric patients: 137<br>Mean age: 37.3 (SD = 12.0)<br>F/M: 0.560 | Ambulatory<br>DSM-IV/DIP-Q | | | 38%<br>52 |
| | N - Forensic psychiatric sample: 217<br>Mean age: 35.5 (SD = 10.3)<br>F/M: 0.070 | Forensic<br>Psychiatric Unit<br>DSM-IV/DIP-Q | | | 41%<br>90 |
| | N - Sample of candidates for psychotherapy: 94<br>Mean age: 34.2 (SD = 8.1)<br>F/M: 0.810 | Ambulatory<br>DSM-IV/DIP-Q | | | 62%<br>58 |
| Ames and Molinari (1994) | N: 200<br>F/M: 0.500 | Community<br>DSM-III/SIDP-R | | | 0.50%<br>1 |
| | N: 200<br>F/M: 0.500 | | | | |
| Samuel et al. (1994) | N: 762<br>F/M: 0.652 | Community<br>DSM-III/SPE | | | 1.70%<br>8 |
| | N: 762<br>F/M: 0.652 | | | | |
| Moran et al. (2006) | N: 2032<br>F/M: 0.510 | Community<br>CID-10/SAP | | | 5.80%<br>113 |
| | N: 1943<br>F/M: 0.510 | | | | |
| Grant et al. (2004) | N: 43093<br>F/M: -<br>Continent: North America<br>Mean age: ≥ 18 | Community<br>DSM-IV/AUDADIS-IV | | | 7.90%<br>3261 |
| | N: 43093<br>F/M: - | | | | |
| Wongpakaran (2005) | N: 99<br>F/M: 0.495<br>Continent: Asia<br>Mean age: 22.56 (range 21–25; SD = 1.53) | Students<br>CID-10/IPDE | | | 2%<br>2 |
| | N: 99<br>F/M: 0.495 | | | | |
| Ha et al. (2007) | N: 585<br>F/M: 0<br>Continent: Asia<br>Mean age: 19.06 ± 0.26 | Community<br>DSM-IV/PDQ-4+ | | | 39.80%<br>233 |
| | N: 585<br>F/M: 0 | | | | |
| Kulkarni et al. (2013) | N: 200<br>F/M: 0.480<br>Continent: Asia<br>N - HCS: 100<br>Mean age: 27.7 ± 8.58<br>F/M: 0.480 | Community<br>CID-10/IPDE | | | 4%<br>4 |
| Eckelius et al. (2001) | N: 557<br>F/M: 0.549<br>Continent: Europe<br>Mean age: females 41.9 (SD 14.3)/males 43.2 (SD 13.8) | Hospital<br>CID-10/IPDE | | | 11%<br>11 |
| | N: 557<br>F/M: 0.549 | Community<br>CID-10 and DSM-IV/DIP-Q | | | DSM-IV = 7.7%,<br>ICD-10 = 7.2%<br>DSM-IV = 43,<br>ICD-10 = 40 |

Note. (*) PD scale abbreviations are shown in Table 4. Additionally, the font size was reduced to fit the page.
2.4. Quality assessment
The purpose of this evaluation was to analyze the methodological quality of the studies included. The Joanna Briggs Institute Checklist for Prevalence Studies (The Joanna Briggs Institute, 2017) was applied to all studies included in the current systematic review, which evaluates sample frame, process and size, setting description, data analysis coverage, valid and reliable evaluation methods, appropriate statistical analysis, and an adequate response rate (Table 1). As a result, all the 46 studies scored 6 on the scale (maximum = 9 points) and were included in the present meta-analysis.

2.5. Data analysis
We used R software version 3.5.0 to run the analysis (Syntax reported in Supplementary File 1). The first step of our previously defined data analysis strategy was to determine the prevalence of OCPD in the general population and among students worldwide. As recommended by Barendregt et al. (2013), we used Freeman-Tukey double arcsine transformation because the prevalences found were close to 0 or 1 (i.e., as in the present study) to normalize its distribution and stabilize its variability. Figure 5 shows the adjusted Forest Plot. P.S.: Different subpopulation numbers (e.g., Psychiatric 1 and 2; Prison 1 and 2) refer to different type of subpopulations assessed in the same study (i.e., case-control design). Figure 6 presents the subgroup analysis - population distribution.
variances. A heterogeneity test (Q test) was used to determine if the differences between prevalence estimations in the studies were bigger than those expected by chance. Heterogeneity between the studies was measured using the I² statistic, which describes the percentage of variability among effect estimates beyond that expected by chance. If the value is below 25%, it implies there being low heterogeneity. A value of 50% implies moderate, and a value of 75% high levels of heterogeneity (Chiang et al., 2022). We used the DerSimonian-Laird estimator for τ². Significant heterogeneity was detected for the combined estimation. Hereupon, we conducted leave-one-out meta-analysis. In addition, we conducted subgroup analysis by type of population, diagnostic criterion, and global region. The Egger’s regression method (Figure 3) was used to assess publication bias (Lim et al., 2019). The presence of statistically significant publication bias was defined as p-values of 0.05 or less. The presence of publication bias was then investigated further using a fail-safe N test (Figure 3) to estimate the number of additional studies needed to make the eventual effect size insignificant (Lim et al., 2019). Then, we plotted an adjusted meta-analysis and forest plot for all the studies, using the ‘trim-and-fill’ technique (Idris, 2012). The trim-and-fill method works by trimming the studies that cause asymmetry in a funnel plot. Hereupon, we conducted leave-one-out meta-analysis. In addition, we conducted subgroup analysis by type of population, diagnostic criterion, and global region. The Egger’s regression method (Figure 3) was used to assess publication bias (Lim et al., 2019). The presence of statistically significant publication bias was defined as p-values of 0.05 or less. The presence of publication bias was then investigated further using a fail-safe N test (Figure 3) to estimate the number of additional studies needed to make the eventual effect size insignificant (Lim et al., 2019). Then, we plotted an adjusted meta-analysis and forest plot for all the studies, using the ‘trim-and-fill’ technique (Idris, 2012). The trim-and-fill method works by trimming the studies that cause asymmetry in a funnel plot.
plot so that the overall effect estimate produced by the remaining studies is minimally influenced by publication bias, and then filling in imputed missing studies in the funnel plot using the bias-corrected overall estimate (Shi and Lin, 2019).

Once significant heterogeneity was found among all the studies, the second step was to conduct univariate analysis to test the individual association of each variable (methodological variables + geographic location of studies) to estimate OCPD combined prevalence by using a meta-regression analysis. In the third step, a random-effects regression model was used to evaluate the variability in estimating OCPD prevalence, following previous studies (Foo et al., 2018). By assuming that the selected studies are random samples from a larger population, the random-effects model attempted to generalize findings beyond the included studies. For these analyses, a significance level of 5% was established.

3. Results

Figure 4 (PRISMA) shows the study selection flow. In order to select the articles of this review, the first and the last authors read the titles and abstracts of all studies searched (n = 4,083). Duplicate studies were excluded, and 1,812 studies were evaluated by titles and abstracts. After that, 252 articles were selected for full-text reading. During this step, 206 articles were excluded: 46 did not report prevalence rates for OCPD; 90 of

![Figure 9. Leave-one-out](image-url)
them reported data of samples at risk for mental disorders or composed by prison population or mentally ill in psychiatric treatment; 10 of them reported any ICD/DSM 5-based diagnosis; 35 of them including individuals younger than 16 years old; and 25 of them were written in languages others than English, Portuguese, or Spanish. Table 2 presents the main results of the included studies.

Eventually, 46 articles were included in this review (Figure 4). The meta-analytic sample included 89,264 individuals, with age ≥16 years old. The total sample is composed mainly of individuals from the general population (n = 78,429). There were also seven studies with students (n = 4,401), 13 studies with psychiatric patients (n = 2,835), seven with prisoners (n = 2,654) and 12 with clinical patients (n = 945). Figure 5 shows the adjusted forest plot in which we found an OCPD prevalence of 6.5% (95% CI: 4.3–9.1%). Non-adjusted meta-analysis models are presented in Figures 6, 7, and 8 (subgroup analysis by population type, global region, and diagnostic criteria).

Out of the 46 included articles, almost half were conducted in Europe, and a third of them in North America. One study included individuals from North America and Africa (Chamberlain et al., 2017). Diagnostic OCPD criteria in the studies were mostly based on DSM-IV (i.e., 26 studies were based on DSM-IV, 11 on ICD-10, 11 on DSM-III, and 2 on DSM-5). Four articles were based on two different criteria (i.e., DSM-IV and ICD-10). The Structured Clinical Interview for Axis II PD (SCID-II) was used in 15 studies; the International PD Examination (IPDE) was used in 9 studies, and the Personality Diagnostic Questionnaire 4+ (PDQ-4+) was used in 5 studies.

The selected articles have been published from 1992 to 2018, with 6 of them from the 90s, 20 of them from the first 2000’s decade, and 20 of them from the 2010s, as described in Table 3. Figure 6 shows that 6.9% (CI 95% = 4.5%-9.8%) of the general population was diagnosed with OCPD. Higher prevalences were found in clinical (16.2%), student (17.4%), prison (19.9%), and psychiatric (29.7%) samples. This lower prevalence in the general population was confirmed in the metaregression model (Table 4).

OCPD presented a stable prevalence throughout several countries of the world in the last 28 years; the geographic location was not associated with a significant difference in prevalence. The following prevalence rates were found in the subgroup analysis (Figure 7): 14.0% in Asia (five studies); 13.1% in Oceanic (four studies); 13.7% in Europe (22 studies), and 9.9% in America (14 studies). These differences were not significant in the metaregression models (Table 4). Studies based on ICD-10 criteria (that showed an OCPD prevalence rate of 17.6%) or on DSM-IV (15.9%) reported higher OCPD prevalence rates than those based on DSM-III criteria (8.1%) (Figure 5). However, these differences were not significant in the metaregression model. The leave-one-out meta-analysis model (Figure 9) found no significant difference when each study was excluded.

No gender-related effect was found in the meta-regression model (Table 4), but it has been reported that the prevalence rates of OCPD decreased with the age increase of the subjects. As found in the subgroup analysis, studies with the general population had significantly lower prevalences of OCPD than those with clinical populations. No significant differences were found among specific regions.

4. Discussion

We conducted a comprehensive systematic review of studies reporting OCPD prevalence rates worldwide and a meta-regression analysis to evaluate its estimation variability. Our results showed a global OCPD prevalence rate of 6.5%. Significant higher levels were found in clinical and psychiatric populations. Younger age was also correlated with higher levels of OCPD.

Among the included studies, a study published in 2002 utilized data from the U.S. National Epidemiological Research about Alcohol and Correlated Conditions, which included over 43,000 individuals in a nationally representative sample. It was the largest study included in this review: OCPD was the most prevalent PD among the general population, affecting 7.9% of the individuals during lifetime; prevalence rates of OCPD were practically the same in males and females but significantly less common in young adults (Grant et al., 2004). Our results corroborated this study since no gender-related effect has been found. However, we found that OCPD prevalence decreased with the age increase of studied subjects.

According to Tyrer et al. (2015), due to the complexity of PDs, their evaluation seems to be a difficult task in clinical practice. Diagnosis should be made out of a life-long disorder. PD affects the interaction with other people, and there are no biological markers or other independent markers for its identification. Considering the high prevalence rate for OCPD found in this review, we must conclude that the diagnostic instruments used to assess this disease are sensible to cross-sectionally assess OCPD signs and symptoms. However, they cannot properly assess OCPD throughout patients’ lives (Tyrer et al., 2015). In addition, OCPD construct comprehensiveness is debated between categorical and dimensional approaches (Rojas and Widiger, 2017). According to Matthews et al. (2009), there was a split between the categorical classification system and the dimensional one based on traits (Matthews et al., 2009), in which the pathological traits increase with the severity of the dimensions (Tyrer and Johnson, 1996).

Diagnostic features of OCPD have been changing over the last decades (Pfohl and Blum, 1995; Costa et al., 2005). Thus, it is not surprising that the current rating scales conceptualize and evaluate OCPD differently. Nowadays, several different self-report measures include a scale for OCPD (McDermutt and Zimmerman, 2005) with a questionable convergent validity (Widiger and Boyd, 2009). According to the American Psychiatric Association (1952), DSM-I described a compulsive personality featured by overconcern “with adherence to standards of conscience or of conformity,” over inhibition, over conscientiousness, “an inordinate capacity for work,” rigidity, chronic tension, and a “lack of a normal capacity for relaxation” (American Psychiatric Association, 1952). There were no major changes in criteria from the first to the second edition of the manual (Pfohl and Blum, 1995; Costa et al., 2005). However, according to Douglas B. Samuel, DSM-III criteria did not include overconcern with morality, over conscientiousness, lack of capacity for relaxation, or chronic tension. DSM-III changed OCPD core feature to include a restricted capacity of expressing warm and tender emotions. All diagnostic criteria went through another substantial review for DSM-III-R since additional criteria were added to represent the original thrust, order, and obstinacy as constructs of the syndrome (Widiger et al., 1988). A generalized perfectionism pattern and inflexibility became the main characteristics (American Psychiatric Association, 1987). In the DSM-IV (American Psychiatric Association, 1994), the restricted demonstration of emotions, a core feature in the DSM-III, was entirely removed from the diagnostic criteria alongside indecision (Pfohl and Blum, 1995). This would justify the results obtained in this study, as the lower prevalence rates based on DSM-III compared to those based on DSM-IV and ICD-10. Despite not finding significant differences in the meta-regression model, the present meta-analysis found higher prevalence rates in studies based on DSM-IV and ICD-10 when compared to those based on DSM-III. This may also suggest that the diagnostic threshold is lower with DSM-IV and ICD-10, leading to false-positive diagnoses.

As far as we know, this is the broadest systematic review about OCPD, including studies from far distant locations, the majority located in the Americas and Europe. The results showed that OCPD prevalence rates are stable worldwide. A few studies were conducted in Asia and Oceania (5 and 4, respectively), and no studies were found from Africa.

Our findings should be compared with the global prevalence data of other PD. According to DSM-5, the average prevalence rate of borderline PD (BPD) in the general population is around 1.6–5.9%, varying from primary care settings (6%), mental health outpatients centers (10%), and hospitalized psychiatric patients (20%) (American Psychiatric Association, 2013). According to Wagner et al. (2013), BPD is a highly prevalent PD in the clinical setting with annual costs visibly higher than other
mental and physical disorders: it has been estimated an average of approximately €26,000 annually, when compared to depression (€2,900) and diabetes (€11,870), for example. Unfortunately, PD has not been included in the Global Burden of Disease Studies (Wagner et al., 2013; Global Burden of Disease Collaborative Network, 2017). We point out that it would be of great importance to estimate average costs generated by patients with OCPD, considering the impact on relational and work areas.

4.1. Limitations

Some limitations should be discussed. Firstly, our bibliographic research was limited to articles published in English, Spanish, and Portuguese. Secondly, characteristics of countries involved, other than geographic location, were not analyzed. However, the geographical location of a country has been conceptually relevant for this study.

4.2. Conclusions

There was no significant variability in OCPD prevalence rates worldwide, affecting almost one over 15 adult individuals. Also, results indicate that more standardized epidemiological data on OCPD are needed. Future studies should also focus on the epidemiology of PD through the different classification systems, such as DSM-5 and ICD-11, and, in particular, on the DSM-5 alternate model, since only two studies were based on DSM-5 criteria (Morgan et al., 2016; Bach et al., 2017). In addition, an evaluation based on a dimensional approach (Sharp et al., 2015), taking into account personality functioning and personality traits in healthy and clinically ill individuals, might be of interest (Volker et al., 2018). Also, analytical factor studies are necessary to clarify which diagnostic features are relevant and how the prevalence of OCPD could be measured in a trustworthy manner. Finally, the present meta-analysis may suggest that the current diagnostic tools may detect OCPD in a cross-sectional assessment but not throughout the life of the person.

Declarations

Author contribution statement

Marina Junqueira Clemente, Maria Olivia Pozzolo Pedro, Henrique Soares Paiva, Cintia de Azevedo Marques Périco, Julio Torresales and Antonio Ventriglio: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Andresson Sousa Martins Silva: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

João Mauricio Castaldelli-Maia: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Declaration of interest’s statement

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