

# **“Evidence-based Checklists” for Identifying Predatory Journals have Not Been Assessed for Reliability or Validity: An Analysis and Proposal for Moving Forward**

Jeremy Y. Ng [1,2]<sup>§</sup>, R. Brian Haynes [3]

[1] Postdoctoral Fellow, Centre for Journalology, Ottawa Methods Centre, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada

[2] PhD Graduate, Department of Health Research Methods, Evidence, and Impact, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada

[3] Professor Emeritus, Department of Health Research Methods, Evidence, and Impact, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada

<sup>§</sup>Corresponding Author's Email Address: [ngjy2@mcmaster.ca](mailto:ngjy2@mcmaster.ca)

ORCiDs:

JYN: <http://orcid.org/0000-0003-0031-5873>

RBH: <http://orcid.org/0000-0002-1453-3196>

**This is an author-produced postprint of an article accepted for publication on 21 June 2021 and published on 25 June 2021 in the Journal of Clinical Epidemiology following peer review. The sharing of this postprint is compliant with the publisher policy as listed on Sherpa Romeo and can be found here: <https://v2.sherpa.ac.uk/id/publication/13811>.**

**This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.**

**The published version of this article can be found at the following citation:**  
Ng JY, Haynes RB. “Evidence-based Checklists” for Identifying Predatory Journals have Not Been Assessed for Reliability or Validity: An Analysis and Proposal for Moving Forward. Journal of Clinical Epidemiology. 2021 Jun 25.  
<https://doi.org/10.1016/j.jclinepi.2021.06.015>.

## Highlights

- In the present study, we identified evidence-based checklists (EBCs) to detect predatory journals (PJs) and critically examined each item in each EBC identified.
- We identified a total of four EBCs and compared them against a published methods guideline for scale development outlined in nine steps and found that no checklist even fully completed step one.
- A number of reasons can explain this finding, the most notable being that all these checklists were developed prior to the publication of a consensus definition of predatory journals and publishers (PJPs) which was published in late 2019.
- We then compared all items from each of the four EBCs against the five components of a recently published consensus definition of PJPs, and a list of items to be considered in the creation of a composite checklist to identify PJs was generated.
- With the recent consensus definition, checklists now have a clearer target, can make adjustments, and proceed to address methods standards for measurement scales; future work should involve creating and assessing a composite checklist that eliminates non-discriminating items.

## Abstract

**Background:** Predatory journals (PJs) pose a threat to the quality/integrity of scientific publishing. Checklists have been proposed to identify PJs, but few are “evidence-based”. This study's objective was to search for/assess evidence-based checklists (EBCs) for reliability and validity, based on a new consensus definition of PJs.

**Methods:** A published methods guideline for scale development was used to identify how many steps were completed in the generation of identified EBCs. Items from each EBC were compared against the consensus definition, and a list of items to be considered in the creation of a composite EBC to identify PJs was generated.

**Results:** Four EBCs were identified. None of these had completed the first of the nine steps for scale development and validation. Forty seven items from the four EBCs were assessed against the consensus definition, of which 28 items fell within the definition. A proposed composite EBC was created from items matching components of the consensus definition.

**Conclusions:** EBCs to detect PJs lack assessment of reliability and validity. To a varying degree, the EBCs contain items that match the scope of the new consensus definition of PJs. With the recent consensus definition, EBCs creators now have a clearer target, and can make adjustments.

## Keywords

checklist; journalology; predatory publishing; reliability; validity

## What is New?

- In the present study, we identified evidence-based checklists (EBCs) to detect predatory journals (PJs) and critically examined each item in each EBC identified.
- We identified a total of four EBCs and compared them against a published methods guideline for scale development outlined in nine steps and found that no checklist even fully completed step one.
- A number of reasons can explain this finding, the most notable being that all these checklists were developed before the publication of a consensus definition of predatory journals and publishers (PJPs) which was published in late 2019.
- We then compared all items from each of the four EBCs against the five components of a recently published consensus definition of PJPs, and a list of items to be considered in the creation of a composite checklist to identify PJs was generated.
- With the recent consensus definition, checklists now have a clearer target, can make adjustments, and proceed to address methods standards for measurement scales; future work should involve creating and assessing a composite checklist that eliminates non-discriminating items.

# 1. Background

Clinicians and policy makers rely on the validity of published scientific research to make well-informed decisions that can have important and life-changing impacts on individuals and society. Predatory publishers pose a threat to the quality and integrity of scientific publishing [1]; specific to clinical and patient-oriented health care research, articles published in predatory journals are being included in systematic reviews which inform the development of clinical practice guidelines [2,3]. Beyond this, clinicians unfamiliar with identifying predatory journals may be using the information found within an article published in such a periodical to inform clinical decisions [4]. Such consequences, therefore, can include potentially direct and negative impacts on patient care. One of the earliest researchers to identify this phenomenon, Jeffery Beall, characterizes them as outlets “which publish counterfeit journals to exploit the open-access model in which the author pays” and publishers that are “dishonest and lack transparency” [5].

Beall sought to combat this by creating a list of potential predatory journals and publishers (PJPs) which he maintained for a number of years. After facing backlash from some publishers that he had included on his list, he eventually ceased to update this list and ultimately took down the list in 2017. As others had archived it, it is still publicly accessible [6]. Though this list served as a starting point in determining what constitutes a predatory publisher, it also contained many flaws. The list did not inform readers how to identify PJPs nor did it provide any recommendations on what to do about the journals suspected of predatory publishing, beyond refraining from publishing in their journals [6].

Cabell's Scholarly Analytics can be largely credited with picking up from where Beall left off in 2017, creating “Cabell's Blacklist” which identified “deceptive, fraudulent, and predatory

practices” [7]. Cabell's Scholarly Analytics created a publicly-available 65-point list [8] which can be used as a tool to identify predatory publishers. Many critics have identified issues with the 65-point list that would determine whether a publisher is blacklisted. For example, some of Cabell's metrics are misleading or inaccurate [7], and cannot differentiate between predatory publishers and new low-quality publishers without malicious intent [6]. Since then, other guidance documents have been published to assist researchers in identifying trusted journals/publishers 9, 10, 11. More recent research has proposed that it may make more sense to identify the degree to which a publication is predatory, based on a spectrum of transparency criteria, rather than categorizing a journal according to a binary system [12,13].

At the time when our study was initiated, although varying definitions existed for PJs, there was no consensus in the academic literature [14]. Since then, however, Grudniewicz et al. [15] published an international consensus definition as follows: “Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices.”

In this study, we systematically searched for evidence-based checklists (EBCs) for identifying predatory journals (PJs), compared their components with the new consensus definition, and assessed the degree to which they were tested for reliability and validity, informed by Boateng et al's [16] three phases and nine steps of scale development and validation. We then composed a composite scale that conforms to the consensus definition.

## 2. Methods

### 2.1. Identifying Evidence-Based Checklists

Using the same methods as Cukier et al. [17], we updated their systematic review to November 2019 to identify evidence-based checklists for identifying potential PJs. In short, Cukier et al. systematically identified checklists that help to detect potential PJs and examined and compared their content and measurement properties; to our knowledge it was the first and only study of its kind at the time of searching.

For the purpose of this study, we adopted the criteria for an EBC based on Cukier et al.'s five criteria (see Cukier et al. [17], page 9-10). Thus, a checklist was considered evidence-based if it scored three or more “yes” answers on the following five questions:

1. Did the developers of the checklist represent more than one stakeholder group (e.g. researchers, academic librarians, publishers)?
2. Do the developers report gathering any data for the creation of the checklist (i.e. conduct a study on potential predatory journals, carry out a systematic review, collect anecdotal data)?
3. Does the checklist meet at least one of the following criteria: (1) Has title that reflects its objectives; (2) Fits on one page; (3) Each item on the checklist is one sentence?
4. Was the checklist pilot-tested or trialed with front-line users (e.g. researchers, students, academic librarians)?
5. Do the authors report how many criteria in the checklist a journal must meet in order to be considered predatory?

## **2.2. Comparing and Contrasting Identified Evidence-Based Checklists Based on Boateng et al.'s (2018) 9 Steps of Scale Development and Validation**

Following the identification of a total of four EBCs, we compared and contrasted identified EBCs based on Boateng et al.'s [16] nine steps of measurement scale development and validation (based on Figure 1 of Boateng et al. (2018)) to identify how many were completed in the generation of the checklist. Boateng et al.'s article was selected as it is one of the most comprehensive, highly cited, and recently-published primers for developing and validating scales.

A data extraction form was constructed, containing the “activity”, “purpose” and “how to explore or estimate?” columns found in Table 1 of Boateng et al. [16]. Two additional columns per EBC corresponding with each “how to explore or estimate?” question were created as follows: 1) “step completed” and 2) “evidence in-text”. This determined how many steps the authors of each EBC had completed in the generation of their checklist, and informed next steps for the present study based on where each of the authors had left off.

## **2.3. Assessing Content Validity**

We assessed the content validity of each EBC, determining the extent to which each checklist represented all aspects of the construct identified by the new consensus definition. Five conditions that must be satisfied in order to achieve content validity are outlined by Guion [18], and summarized by Boateng et al. [16] as follows:

*“(a) the behavioral content has a generally accepted meaning or definition; (b) the domain is unambiguously defined; (c) the content domain is relevant to the purposes of measurement; (d) qualified judges agree that the domain has been adequately sampled based on consensus; and (e) the response content must be reliably observed and evaluated.”*

These three conditions of content validity were largely described by Cobey et al. [14] who conducted a scoping review seeking to answer the question “What is a predatory journal?” and subsequently found that statements describing a PJ could be thematically grouped into six categories as follows: journal operations; article; editorial and peer review; communication; article processing charges; and dissemination, indexing and archiving. Though such themes were identified, they were unable to come up with an agreed upon definition from the literature alone, thus they identified obtaining a consensus definition as a goal. This was achieved by Grudniewicz et al. [15] via a three-round modified Delphi survey involving leading scholars and publishers, meeting the fourth condition of content validity.

Each item found in each EBC was assessed against Grudniewicz et al.’s definition of PJPs [15]. We divided Grudniewicz's definition into five separate components to determine how many pertained to a given item, and answered “Yes” or “No” based on how Grudniewicz explained/defined each portion of their definition in their article. Specifically, we sought to identify whether an item addressed: 1) "prioritization of self-interest at the expense of scholarship", 2) "false or misleading information", 3) "deviation from best editorial and publication practices" (based on: <http://wame.org/principles-of-transparency-and-best-practice-in-scholarly-publishing>), 4) "a lack of transparency", and 5) "the use of aggressive and indiscriminate solicitation practices". We determined that an item aligned with Grudniewicz et al.'s definition [15] if "yes" was answered to at least one of the five components of the definition.

#### **2.4. Assessment of Similar Items and Creation of a Composite Checklist**

All identified EBCs were compared and contrasted in preparation for the creation of a composite checklist. Items for which “No” was answered for all five components of Grudniewicz's definition were excluded, which served to eliminate non-discriminating items. Here, we define a non-discriminating item as one that does not differentiate between the two categories of journals (i.e., “predatory” and “not predatory”). All remaining items meeting at least one of the five components were reviewed, and in the case where one or more of them were determined to be the same or very similar, they were combined into a single item. All remaining items comprised a composite checklist proposed for pre-testing of questions.

### **3. Results**

#### **3.1. Findings from Eligible Articles**

A PRISMA diagram reflecting our updated searches across all databases is provided in Figure 1. Potentially eligible articles were published in 2018 and 2019 in India (n=2), the United States (n=2) and Canada (n=1), 19, 20, 21, 22, 23. In our updated search, Patwardhan et al.'s [23] checklist was the only one identified as evidence-based, with three “yes” answers on the questions based on Cukier et al.'s [17] five aforementioned criteria. We extracted data from the three studies identified by Cukier et al [17] and the one additional study found in our update (Table 1, Table 2, Table 3).

#### **3.2. Characteristics of Evidence-Based Checklists**

Characteristics of the four identified EBCs 23, 24, 25, 26 are provided in Table 4, Table 5, Table 6. All four checklists were published between 2016 and 2018. For risk of bias assessment, no checklist scored five “yes”s; one checklist scored four “yes”s [24], while the remaining three scored three “yes”s [23,25,26]. Thematic categories covered by the checklists

were as follows: journal operations (n=4), article (n=1), editorial and peer review (n=4), communications (n=3), article processing charge (n=2), and dissemination, indexing + archiving (n=4).

### **3.3. Comparison of Identified Evidence-Based Checklists**

In the published articles containing the checklists, all four specified the purpose of the domain (step 1.1), and described the domain and provided preliminary conceptual definition (step 1.3), while only three specified whether the domain had been previously defined a priori (step 1.4), and defined each dimension (step 1.5) 24, 25, 26. There was no mention in any of the four articles of confirming that there were no existing instruments (step 1.2), at any point in the process of developing their respective checklists.

No studies completed any steps beyond step 1.5, that is, they failed to complete a literature review and assessment of existing scales (step 1.6), and they did not identify exploratory research methodologies including focus group discussions and interviews (step 1.7), as well as any steps from 2-9, including assessing content validity, pre-testing questions, sampling and survey administration, item reduction, extraction of factors, and conducting tests of dimensionality, reliability, and validity. The completed data extraction form is found in Supplementary File 1.

### **3.4. Content Validity of Evidence-Based Checklists' Items**

A total of 47 items from four EBCs were assessed against Grudniewicz et al.'s definition of PJPs [15]. Those meeting at least one of the five components were deemed to meet Grudniewicz's et al.'s definition of PJPs. All other items were determined to not meet this definition based on one of two reasons: 1) it was unclear based on the wording of the

question and open to misinterpretation, or 2) did not meet at least one of the five components. In total, 28 items fell within the definition, and 19 did not. Of these 19, 5 were specifically unclear due to vague or ambiguous wording. For example, one item asked the user to consider “How accessible is this journal's website?”, however, no further details were available to provide guidance on what constituted “accessible”. Nine of these 19 items, focused on items that if satisfied, can help demonstrate the legitimacy of a journal, however, if not satisfied, do not automatically categorize the journal as predatory. Examples of these items include whether a journal is indexed in reputable academic database (i.e. Medline), whether the journal's publisher is a member of a publishing association/organization (i.e. COPE), or whether a publisher has existed for a long time. The remaining 5 items related to submission/publication fees, however, the levying of fees to support the general operations of a publication in and of itself is not necessarily a predatory practice. The completed data extraction form is found in Supplementary File 2. This file also sorts these 47 items into five unique categories, which include the following: journal operations; article; editorial and peer review; communications; article processing charge; dissemination, indexing + archiving. A summary table providing a breakdown of items pertaining to each checklist is provided in Table 7.

Of the 28 items meeting the definition, “prioritization of self-interest at the expense of scholarship” was addressed by nine items, “false or misleading information” by 16 items, “deviation from best editorial and publication practices” by 21 items, “lack of transparency” by 14 items, and “use of aggressive and indiscriminate solicitation practices” by three items. A summary table providing a breakdown of items based on Grudniewicz's et al. (2019)'s five components of the definition is provided in Table 8. Of the 28 items meeting the definition,

we determined that 18 were the same or very similar to at least one other item, while 10 items were unique, as shown in Supplementary File 3.

### **3.5. Proposed Composite Checklist**

Based on the 28 items, we created a list of items to be considered in the creation of a composite checklist to identify predatory journals based on Grudniewicz's et al.'s five components of the definition of predatory journals and publishers, found in Table 9 (Please see online appendix). For each category, we provide proposed wording for each item, as there were instances where we felt that some items provided by one or more of the four EBCs lacked clarity or would present a challenge to the user to answer.

## **4. Discussion**

While many checklists have been developed since the initial creation of Beall's list, the vast majority were not evidence-based. In addition, as mentioned by Cukier et al. [17], few checklists were accompanied by concrete guidance on how they should be used, or provided any weightings or cut-offs associated with the items in their checklist to definitively identify whether a journal is predatory. Despite this, the content of these checklists generally did not differ greatly, which suggests that there is rough agreement on what characteristics indicate the predatory nature of a journal. At the time of publication, Cukier et al. [17], wrote that “the lack of checklists providing threshold values could be due to the fact that a definition of predatory journals does not exist”, explaining that the “provision of detailed requirements that would qualify a journal as predatory therefore would be a challenge”. Since this time, Cukier et al. [27] published a paper which sought to define PJs and respond to the threat they pose using a modified Delphi consensus process. Shortly thereafter, Grudniewicz et al. [15],

of the same research group, published a consensus definition of “predatory journals and publishers”.

The present study built on the work of Cukier et al. [17,27] and Grudniewicz et al. [15] by critically examining each item in each EBC identified. We compared and contrasted these four EBCs against Cukier et al.’s five-item risk of bias assessment [17] and Boateng et al.’s nine steps of scale development [16] to identify how many were completed in the generation of the checklist. To our knowledge, Cukier et al. were the first to develop a risk of bias assessment for the purpose of assessing predatory publishing checklists [17]. It was not clear how Cukier et al.’s five items were included in the risk of bias assessment as described in their study, however, the items themselves reflected a fairly low standard for assessing risk of bias, likely because the authors (correctly) suspected that the vast majority of checklists would not even meet the criteria of these five items.

The lack of rigour in how these four EBCs were developed is also reflected when we assessed them against Boateng et al.’s nine steps of scale development [17]. Of the nine steps outlined, we found that no checklist even fully completed step one. A number of reasons can explain this finding, the most notable being that all these checklists were developed prior to the publication of a consensus definition of PJPs which was published in late 2019 [15]; with a lack of an agreed upon definition, and therefore, a poor understanding of the relevant domain(s) being measured, this would unsurprisingly impede even the completion of Boateng’s first step of scale development. Additional reasons include the fact that this phenomenon is relatively new and a lack of validated standard of measurement exists. Although a number of PJ “blacklists” and “whitelists” exist, produced by different people or organizations, such as Beall’s List [28], Cabell’s List [8], and the Directory of Open Access

Journals [29], published research has found that an overlap often exists between the whitelist of one and the blacklist of the other [30,31]. Beyond these problematic lists, no equivalent instrument currently exists in validating whether a journal is in fact predatory or not, even on a case-by-case basis.

To address this issue, we compared all items from each of the four EBCs against the five components of Grudniewicz et al.'s consensus definition [15] to determine which items met at least one of the five components. This also allowed us to determine whether items meeting the definition were similar or unique to other items across all EBCs. Despite this, it is worth considering that it may not be completely feasible to categorize journals as “predatory” and “non-predatory”, but rather it may make more sense to instead identify the “risk of predatoriness” of a publication [12,13]. In many regards, variations in journal editorial and business practices are a result of a publisher's accessibility to resources (financial and otherwise); differences in funding, resources, and country of origin can arguably all serve to advantage or disadvantage a publisher's ability to produce and operate a high-quality periodical even if their editorial team has the best intentions [32,33].

Near-term future work should involve creating and assessing a composite checklist that eliminates non-discriminating items (ones that do not differentiate between the two categories of journals [i.e. “predatory” and “new but not predatory”]), assessing the reliability and validity of the scale, and completing the other steps as laid out by Boateng et al. [16], based on the data we provide in Table 9. Longer-term future work may also include focussing on identifying and setting standards surrounding the editorial and business transparency practices of a journal which can help set benchmarks to achieve across publishers.

#### **4.1. Study Strengths and Limitations**

The comparison of EBCs with Boateng's nine steps of scale development provided excellent insight into how well they were tested for reliability and validity. In updating Cukier et al.'s [17] systematic review, we adopted the same five questions developed by their research team to assess risk of bias. However, it is unclear whether this tool was assessed for reliability or validity. Cukier et al. [17] state that they adapted their tool from “A Checklist for Checklists” tool (see [http://www.projectcheck.org/uploads/1/0/9/0/1090835/checklist\\_for\\_checklists\\_final\\_10.3.pdf](http://www.projectcheck.org/uploads/1/0/9/0/1090835/checklist_for_checklists_final_10.3.pdf)). The “Guidelines on developing checklists” provided is a Microsoft Word document file with weblinks to different guideline development groups (i.e. ProjectCheck, GRADE, AGREE, etc.), however, no detailed methodologies were provided as to how these different guideline resources informed the development of their five item tool. Thus, it appears that Cukier et al. [17] based their five item tool solely on face validity. This suggests that more work may need to be done to refine Cukier et al.'s [17] tool to ensure that it is sufficiently reliable and valid in identifying EBCs.

### **5. Conclusion**

Checklists to detect PJs are at an early stage of development and lack assessment of reliability and validity. To a varying degree, the EBCs contain items that match the new consensus definition of PJs, but also lack some of its features. The most obvious reason for this is that there had not been consensus on a definition for PJs at the time that the scales were published. With the recent consensus definition, checklists now have a clearer target, can make adjustments, and proceed to address methods standards for measurement scales. We present a template for building a scale based on the consensus definition.

## **Abbreviations**

DOAJ: Directory of Open Access Journals

EBC: evidence-based checklist

PJ: predatory journal

PJPs: predatory journals and publishers

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

## **Declarations**

### **Ethics Approval and Consent to Participate**

This study involved a systematic search and assessment of the literature only; it did not require ethics approval or consent to participate.

### **Consent for Publication**

All authors consent to this manuscript's publication in the order in which the authors are listed in the cover sheet.

### **Availability of Data and Materials**

No additional data available.

### **Competing Interests**

The authors declare that they have no competing interests.

## **Funding**

This study was not funded.

## **Author Contributions**

JYN: conceptualized and co-designed the study, collected the data, interpreted and analysed the data, drafted the manuscript, and gave final approval of the version to be submitted.

RBH: co-designed the study, interpreted and analysed the data, provided contributions and critically revised the manuscript, and gave final approval of the version to be submitted.

All authors have read and approved the manuscript.

Transparency Declaration: The lead author acknowledges that the manuscript is an honest, accurate, and transparent account of the study being reported, and that no important aspects of the study have been omitted.

## **Acknowledgements**

JYN was awarded a Research Scholarship and an Entrance Scholarship from the Department of Health Research Methods, Evidence and Impact, Faculty of Health Sciences at McMaster University.

## References

1. Manca A, Cugusi L, Cortegiani A, Ingoglia G, Moher D, Deriu F. Predatory journals enter biomedical databases through public funding. *BMJ*. 2020 Dec 8;371:m4265.
2. Rice, D.B., Skidmore, B. & Cobey, K.D. Dealing with predatory journal articles captured in systematic reviews. *Syst Rev* 10, 175 (2021). <https://doi.org/10.1186/s13643-021-01733-2>
3. Ross-White A, Godfrey CM, Sears KA, Wilson R. Predatory publications in evidence syntheses. *Journal of the Medical Library Association: JMLA*. 2019 Jan;107(1):57.
4. Richtig G, Richtig E, Böhm A, Oing C, Bozorgmehr F, Kruger S, Kiesewetter B, Zielinski C, Berghoff AS. Awareness of predatory journals and open access among medical oncologists: results of an online survey. *ESMO open*. 2019 Jan 1;4(6):e000580.
5. Beall J. Predatory publishers are corrupting open access. *Nature News*. 2012 Sep 13;489(7415):179.
6. Strielkowski W. Predatory Publishing: What Are the Alternatives to Beall's List? *The American Journal of Medicine*. 2018 Apr;131(4):333-334.
7. Blobaum P. Cabells Scholarly Analytics: A Go-To Authority on Journal Quality. *Online Searcher*. 2018 May-Jun:20-23.
8. Cabell's Blacklist Violations [Internet]. Cabells Scholarly Analytics (CSA); 2017 [cited 2019 Feb 21]. Available from: <https://www2.cabells.com/blacklist-criteria>
9. Predatory Publishing. [Internet]. Committee on Publication Ethics; 2019 [cited 2021 Jun 13]. Available from: <https://publicationethics.org/resources/discussion-documents/predatory-publishing>
10. Laine C, Winker MA. Identifying Predatory or Pseudo-Journals. [Internet]. World Association of Medical Editors; 2017. [cited 2021 Jun 13]. Available from: <http://www.wame.org/identifying-predatory-or-pseudo-journals>

11. Home [Internet]. Think. Check. Submit.; 2021. [cited 2021 Jun 13]. Available from: <https://thinkchecksubmit.org/>
12. Tsigaris P, da Silva JA. Why blacklists are not reliable: a theoretical framework. *The Journal of Academic Librarianship*. 2021 Jan 1;47(1):102266.
13. da Silva JA, Tsigaris P. Issues with criteria to create blacklists: An epidemiological approach. *The Journal of Academic Librarianship*. 2020 Jan 1;46(1):102070.
14. Cobey KD, Lalu MM, Skidmore B, Ahmadzai N, Grudniewicz A, Moher D. What is a predatory journal? A scoping review. *F1000Research*. 2018;7.
15. Grudniewicz A, Moher D, Cobey KD, Bryson GL, Cukier S, Allen K, Ardern C, Balcom L, Barros T, Berger M, Ciro JB. Predatory journals: no definition, no defence.
16. Boateng GO, Neilands TB, Frongillo EA, Melgar-Quiñonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Frontiers in public health*. 2018 Jun 11;6:149.
17. Cukier S, Helal L, Rice DB, Pupkaite J, Ahmadzai N, Wilson M, Skidmore B, Lalu MM, Moher D. Checklists to detect potential predatory biomedical journals: a systematic review. *BMC medicine*. 2020 Dec;18:1-20.
18. Guion RM. Content validity—The source of my discontent. *Applied Psychological Measurement*. 1977 Jan;1(1):1-0.
19. Babor TF, Ward JH. Caveat Emptor: Predatory Publishers, Rogue Journals, and the Potential Corruption of Addiction Science. *Journal of studies on alcohol and drugs*. 2018 Jul;79(4):509-13.
20. Ross-White A, Godfrey CM, Sears KA, Wilson R. Predatory publications in evidence syntheses. *Journal of the Medical Library Association: JMLA*. 2019 Jan;107(1):57.
21. Sharma K, Rani M, Sharma L. Scrutinizing predator journals in pharmacology and calculating their predatory rate. *Indian Journal of Pharmacology*. 2019 May;51(3):208.

22. Strong G. Understanding Quality in Research: Avoiding Predatory Journals. *Journal of Human Lactation*. 2019 Nov;35(4):661-4.
23. Patwardhan B, Nagarkar S, Gadre SR, Lakhotia SC, Katoch VM, Moher D. A critical analysis of the 'UGC-approved list of journals'. *Curr Sci*. 2018 Mar 25;114(6):1299.
24. Dadkhah M, Bianciardi G. Ranking predatory journals: solve the problem instead of removing it!. *Advanced pharmaceutical bulletin*. 2016 Mar;6(1):1.
25. Hansoti B, Langdorf MI, Murphy LS. Discriminating between legitimate and predatory open access journals: report from the International Federation for Emergency Medicine Research Committee. *Western Journal of Emergency Medicine*. 2016 Sep;17(5):497.
26. Mouton J, Valentine A. The extent of South African authored articles in predatory journals. *South African Journal of Science*. 2017 Aug;113(7-8):1-9.
27. Cukier S, Lalu M, Bryson GL, Cobey KD, Grudniewicz A, Moher D. Defining predatory journals and responding to the threat they pose: a modified Delphi consensus process. *BMJ open*. 2020 Feb 1;10(2).
28. Beall J. [Internet]. Beall's List of Predatory Journals and Publishers; 2020. [cited 2021 Jun 13]. Available from: <https://bealllist.net/>
29. Directory of Open Access Journals [Internet]. Directory of Open Access Journals (DOAJ).; 2020 [cited 2021 Jun 13]. Available from: <https://doaj.org/>
30. Eykens J, Guns R, Rahman AJ, Engels TC. Identifying publications in questionable journals in the context of performance-based research funding. *PloS one*. 2019;14(11).
31. Strinzel M, Severin A, Milzow K, Egger M. Blacklists and whitelists to tackle predatory publishing: a cross-sectional comparison and thematic analysis. *MBio*. 2019 Jun 25;10(3):e00411-19.

32. Shamseer L, Moher D, Maduekwe O, Turner L, Barbour V, Burch R, Clark J, Galipeau J, Roberts J, Shea BJ. Potential predatory and legitimate biomedical journals: can you tell the difference? A cross-sectional comparison. *BMC medicine*. 2017 Dec;15(1):1-4.
33. Mwangangi Matheka D, Nderitu J, Mutonga D, Iwaret Otiti M, Siegel K, Rhyll Demaio A. Open access: academic publishing and its implications for knowledge equity in Kenya. *Globalization & Health*. 2014 Apr 1;10(1).

POSTPRINT

## Figure Legend

Figure 1. PRISMA Diagram

## Table Legend

Table 1. Characteristics of Checklists

Table 2. Risk of Bias Assessment

Table 3. Thematic Categories Covered by the Checklists\*

Table 4. Features of Evidence-based Checklists According to Criteria of Cukier et al. [10]

Table 5. Risk of Bias Assessment. Three “Yes” assessments results in an overall assessment of evidence based. (evidence-based checklists only, as identified by Cukier et al. [10] and updated search)

Table 6. Thematic Categories Covered by the Checklists

Table 7: Evidence-Based Checklist Items Meeting Grudniewicz’s et al.’s [6] Definition of Predatory Journals and Publishers

Table 8: Evidence-Based Checklist Items Based on Grudniewicz’s et al.’s [6] Five Components of the Definition of Predatory Journals and Publishers

## Supplementary Files

Supplementary File 1: Data Extraction Form Comparing and Contrasting Evidence-Based Checklists Based on Boateng’s Nine Steps of Scale Development and Validation

Supplementary File 2: Data Extraction Form Assessing the Content Validity of Items Contained in Identified Evidence-Based Checklists

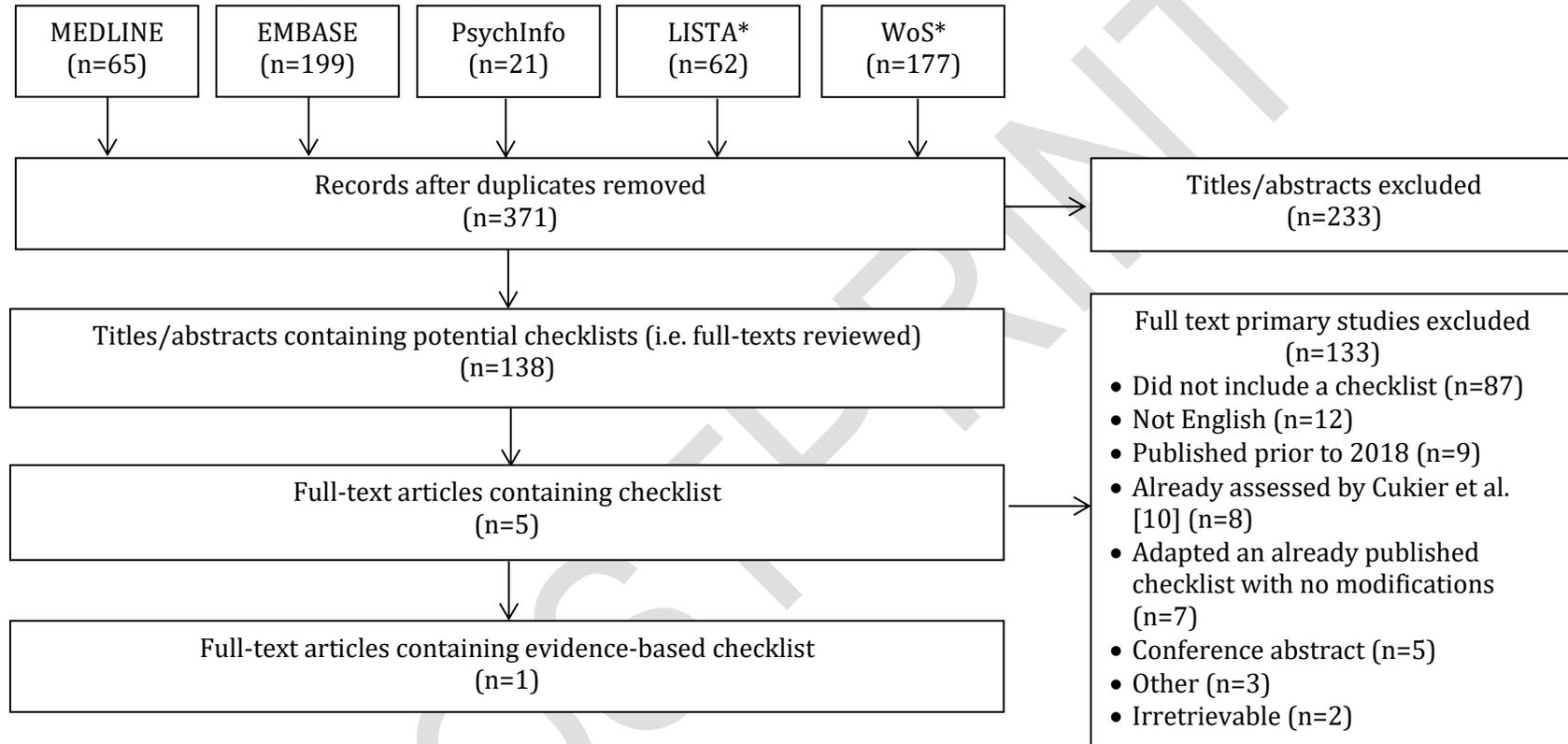
Supplementary File 3: Assessment of Similar Items across Evidence-Based Checklists

Supplementary File 4: Table 9: Items to be Considered in the Creation of a Composite Checklist to Identify Predatory Journals Based on Grudniewicz's et al.'s [6] Five Components of the Definition of Predatory Journals and Publishers

POSTPRINT

# Figures

**Figure 1: PRISMA Diagram for the Update Search**



\*List of Abbreviations: LISTA = Library, Information Science & Technology Abstracts; WoS = Web of Science

## Tables

**Table 1. Characteristics of Checklists**

Author(s)	Article Title	Year Published	Checklist Name	Number of Items	Items Weighted Y/N	Time to Complete Min	Methods Used to Develop Checklist (NR = Not Reported)	Qualitative Guidance Y/N*	Quantitative Guidance Y/N*
Babor 2018	Caveat emptor: Predatory publishers, rogue journals, and the potential corruption of addiction science	2018	No title	12	N	Not Assessed	NR	N	Y
Patwardhan 2018	A critical analysis of the 'UGC-approved list of journals'	2018	No title	16	Yes (though only for secondary criteria)	Not Assessed	University Grants Commission (UGC) checklist criteria available at <a href="https://www.ugc.ac.in/journallist/methodology.pdf">https://www.ugc.ac.in/journallist/methodology.pdf</a>	N	Y
Ross-White 2019	Predatory publications in evidence syntheses	2019	No title	3	N	Not Assessed	NR	N	N
Sharma 2019	Scrutinizing predator journals in pharmacology and calculating their predatory rate	2019	No title	13	Yes	Not Assessed	Modified checklist of Dadkhah and Bianciardi (2016); assessed 131 journals	Y	Y
Strong 2019	Understanding Quality in Research: Avoiding Predatory Journals	2019	No title	30	No	Not Assessed	NR	N	N

\*Qualitative guidance was defined as “instructions on how to use the checklist and what to do with the results” and quantitative guidance was defined as “instructions on summing the results or quantitatively assessing the results to inform a decision”, as per Cukier et al. [10].

**Table 2. Risk of Bias Assessment**

Study	Represent 1+ Stakeholder Groups (Y/N/U)	Gather Data for Checklist Development (Y/N/Only Citations/U)	Title (Y/N)	Fits on One Page (Y/N)	Each Item One Sentence (Y/N)	Meets at Least One of These (Y/N)	Pilot Test (Y/N/U)	Includes Number of Criteria to be Considered Predatory (Y/N)	Overall Assessment (Is it Evidence-Based?) (Y/N)*
Babor 2018	U	Only Citations	N	Y	Y	Y	N	Y	N
Patwardhan 2018	U	U	N	Y	Y	Y	Y	Y	Y
Ross-White 2019	N	Only Citations	N	Y	Y	Y	N	N	N
Sharma 2019	U	Only Citations	N	N	Y	Y	N	Y	N
Strong 2019	N	Only Citations	N	Y	Y	Y	N	N	N

\* Three “Yes” assessments results in an overall assessment of “evidence based”, as per Cukier et al. [10].

**Table 3. Thematic Categories Covered by the Checklists\***

<b>Study</b>	<b>Categories Covered by Checklist</b>					
	<b>Journal Operations</b>	<b>Article</b>	<b>Editorial and Peer Review</b>	<b>Communications</b>	<b>Article Processing Charge</b>	<b>Dissemination, Indexing + Archiving</b>
Patwardhan 2018	Y	N	Y	Y	Y	Y
Babor 2018	N	Y	Y	Y	Y	Y
Ross-White 2019	Y	Y	Y	Y	Y	Y
Sharma 2019	Y	N	Y	Y	Y	Y
Strong 2019	Y	N	Y	Y	Y	Y

\*Thematic categories adapted from Cukier et al. [10].

**Table 4. Features of Evidence-based Checklists According to Criteria of Cukier et al. [10]**

Author(s)	Checklist Name	Number of Items	Items Weighted Y/N	Time to Complete Min	Methods Used to Develop Checklist (NR = Not Reported)	Qualitative Guidance Y/N*	Quantitative Guidance Y/N*
Dadkhah 2016	Criteria to rank predatory journals	14	Yes	10+ min	Observational study of 150 journals, 80 predatory, 70 non	Y	Y
Hansoti 2016	Overall Approach to Choosing the Journal	11	No	0-5 min	Multiple references	N	N
Mouton 2017	Comparing the characteristics of good practice in scholarly publishing with those of predatory publishing	7	No	0-5 min	In-depth assessment of journals identified by Beall's list where South African authors published	N	N
Patwardhan 2018	No title	15	Yes (though only for secondary criteria)	10+ min	University Grants Commission (UGC) checklist criteria available at <a href="https://www.ugc.ac.in/journalist/methodology.pdf">https://www.ugc.ac.in/journalist/methodology.pdf</a>	N	Y

\*Qualitative guidance was defined as “instructions on how to use the checklist and what to do with the results” and quantitative guidance was defined as “instructions on summing the results or quantitatively assessing the results to inform a decision”, as per Cukier et al. [10].

**Table 5. Risk of Bias Assessment. Three “Yes” assessments results in an overall assessment of evidence based. (evidence-based checklists only, as identified by Cukier et al. [10] and updated search)**

Study	Represent 1+ Stakeholder Groups (Y/N/U)	Gather Data for Checklist Development (Y/N/Only Citations/U)	Title (Y/N)	Fits on One Page (Y/N)	Each Item One Sentence (Y/N)	Meets at Least One of These (Y/N)	Pilot Test (Y/N/U)	Includes Number of Criteria to be Considered Predatory (Y/N)	Overall Assessment (Is it Evidence-Based?) (Y/N)
Dadhka h 2016	U	Y	Y	Y	Y	Y	Y	Y	Y
Hansoti 2016	Y	Y	N	Y	N	Y	U	N	Y
Mouton 2017	U	U	Y	Y	N	Y	Y	Y	Y
Patwar dhan 2018	U	U	N	Y	Y	Y	Y	Y	Y

**Table 6. Thematic Categories Covered by the Checklists**

<b>Study</b>	<b>Categories Covered by Checklist</b>					
	<b>Journal Operations</b>	<b>Article</b>	<b>Editorial and Peer Review</b>	<b>Communications</b>	<b>Article Processing Charge</b>	<b>Dissemination, Indexing + Archiving</b>
Dadkhah 2016	Y	N	Y	Y	Y	Y
Hansoti 2016	Y	Y	Y	N	N	Y
Mouton 2017	Y	N	Y	Y	N	Y
Patwardhan 2018	Y	N	Y	Y	Y	Y

**Table 7: Evidence-Based Checklist Items Meeting Grudniewicz’s et al.’s [6] Definition of Predatory Journals and Publishers**

Evidence-Based Checklist	Total Number of Items	Meets Definition	Does Not Meet Definition	
		Meets at Least 1 of the 5 Components	Unclear Wording	Does Not Meet at Least 1 of the 5 Components
Dadkhah et al., 2016	14	4	2	8
Hansoti et al., 2016	11	7	1	3
Mouton et al., 2017	7	6	1	0
Patwardhan et al., 2018	15	11	1	3
Subtotals	47	28	5	14
Totals	47	28	19	

**Table 8: Evidence-Based Checklist Items Based on Grudniewicz's et al.'s [6] Five Components of the Definition of Predatory Journals and Publishers**

Evidence-Based Checklist	Number of Items Addressing...				
	Prioritization of Self-Interest at the Expense of Scholarship	False or Misleading Information	Deviation from Best Editorial and Publication Practices	Lack of Transparency	Use of Aggressive and Indiscriminate Solicitation Practices
Dadkhah et al., 2016	1	2	3	2	1
Hansoti et al., 2016	2	4	5	3	0
Mouton et al., 2017	3	4	5	2	1
Patwardhan et al., 2018	3	5	7	6	1
Totals	9	16	21	14	3