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Open science practices for eating disorders research

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Abstract

This editorial seeks to encourage the increased application of three open science practices in eating disorders research: Preregistration, Registered Reports, and the sharing of materials, data, and code. For each of these practices, we introduce updated I*nternational Journal of Eating Disorders* author and reviewer guidance. Updates include the introduction of open science badges; specific instructions about how to improve transparency; and the introduction of Registered Reports of systematic or meta-analytical reviews. The editorial also seeks to encourage the study of open science practices. Open science practices pose considerable time and other resource burdens. Therefore, research is needed to help determine the value of these added burdens and to identify efficient strategies for implementing open science practices.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

Keywords

clinical trial preregistration; data sharing; eating disorder; material sharing; open access; open science; registered report; replication; reproducibility; transparency

1 | INTRODUCTION

In principle, all science should be "open science": a core tenet of the scientific method is that findings derived from scientific work should be available for public scrutiny and independent reproducibility or replication efforts. Relatedly, researchers should disclose sources of conflict so others can consider whether potential biases may have impacted results. Globally, governments have affirmed that publicly funded research data and findings are a common good that should be available freely to their citizens; as such, many have implemented policies to facilitate transparency of and access to the work products of research (National Mental Health Research Council of Australia, 2021; Science Europe Working Group on Open Access, 2015; United Nations Educational Scientific and Cultural Organization, 2021). Yet in practice, some scientific findings cannot be replicated or reproduced due to lack of transparency (e.g., incomplete descriptions of study methods), lack of access (e.g., bias toward publishing studies with statistically significant results rather than all results), or outright fraud (e.g., Simmons, Nelson, & Simonsohn, 2018).

Technological advances have vastly expanded researchers' opportunities to openly share their discoveries (i.e., improved access) and the methods by which those discoveries were achieved (i.e., improved transparency). Researchers from a variety of disciplines have proposed leveraging technology to develop new (or enhance existing) strategies for improving transparency of and access to research findings (van der Zee & Reich, 2018). Specifically, advocates for open science call for *openness of knowledge dissemination* (preprints; open access publishing), *openness of research plans* (study preregistration; Registered Reports), and *openness of data, materials, and code* (material and data sharing) (Crüwell et al., 2018).

Scientific journals play an important role in ensuring that science is, indeed, open, both in terms of access (e.g., open versus restricted) and transparency (e.g., reporting guidelines). Numerous journals, including the *International Journal of Eating Disorders* (*IJED*, see Table 1), have updated their policies and provided resources consistent with the open science framework (Alter & Gonzalez, 2018; Forero, Lopez-Leon, & Perry, 2020; Freedland, 2021; Hildebrandt & Crosby, 2018; Hildebrandt & Prenoveau, 2020; Martone, Garcia-Castro, & VandenBos, 2018; Munafò et al., 2017; Nosek et al., 2015; Prager et al., 2019; Tackett, Brandes, King, & Markon, 2019; Tackett, Brandes, & Reardon, 2019). Also, some journals reward open science practices by placing "open research badges" on articles (see https://www.cos.io/initiatives/badges). Finally, many journals have transitioned from restricted access (i.e., readers pay a subscription or article fee) to hybrid models which let authors select restricted versus open access options; in the latter, publishers receive payment from authors or government contracts in exchange for open access. Nonetheless, open science journal policies are not universal nor are they always followed (Cybulski, Mayo-Wilson, &

Grant, 2016; Knottnerus & Tugwell, 2016; Naudet et al., 2018; Nutu, Gentili, Naudet, & Cristea, 2019).

With this editorial, we hope to encourage the growing support for open science practices in the eating disorders field. First, we explain our advocacy for the increased adoption of open science practices. Next, we illustrate the core open science practices with examples from our field and provide updated *IJED* author and reviewer guidance. Finally, we suggest that the "science of open science" represents an exciting opportunity for innovation in eating disorders research.

2 | OPEN SCIENCE PRACTICES HELP MITIGATE OUR FIELD'S FUNDAMENTAL RESEARCH CHALLENGES

Transparency and open access are essential to scientific progress in general, but especially so in applied research fields such as eating disorders, in which research guides clinical practice. Our field faces distinct challenges that hamper progress toward reducing the burden of suffering from eating disorders (e.g., Weissman, 2019). Many of these challenges may be reduced by adopting open science practices.

2.1 | The sample size problem

In general, clinical studies have been found to include suboptimal sample sizes for detecting small, yet clinically meaningful, effects (Reardon, Smack, Herzhoff, & Tackett, 2019). A major reason for under-powered studies is difficulty recruiting members of narrowly defined (and therefore small) and often hard to reach or retain populations. Although eating disorders are quite common overall (Burt et al., 2020; Kjeldbjerg & Clausen, 2021; Mitchison et al., 2020; Santomauro et al., 2021; Udo & Grilo, 2018; Wu, Liu, Li, Ma, & Wang, 2020), researchers may find it difficult to recruit specific subgroups (e.g., individuals with anorexia nervosa) within a reasonable timeframe. Any steps researchers can take to harmonize recruitment, assessment, training, or intervention protocols, and to share data will help accelerate discovery. An example of such efforts is the ENIGMA Eating Disorders Working Group (http://enigma.ini.usc.edu/ongoing/enigma-eating-disorders/); it is sharing data collection protocols and harmonizing structural brain imaging data from individuals with anorexia nervosa and bulimia nervosa across international sites.

2.2 | The research funding problem

In many countries, governmental funding for eating disorders is starkly lower than for mental disorders of comparable prevalence or clinical impairment (Austin, Hutcheson, Wickramatilake-Templeman, & Velasquez, 2019; Couzin-Frankel, 2020; Murray, Pila, Griffiths, & Le Grange, 2017). For example, in the United Kingdom, 1% of mental health research expenditure is for eating disorders versus 14.2% for schizophrenia and psychosis (Treasure, Duarte, & Schmidt, 2020); in Australia, research funding equates to approximately $1.10/individual with an eating disorder versus $67.36/individual with schizophrenia (Murray et al., 2017). The dearth of funding impedes scientific progress and makes it difficult for researchers to establish an academic career in eating disorders. Low research productivity adversely impacts success in attracting funding, creating a vicious

cycle of limited resources contributing to continued lack of access to funding. Scarcity of research support makes it imperative to make the most with the resources available for conducting studies. For example, being able to access existing data for exploring new research questions represents a viable option for building a publication track record, even for investigators with paltry resources. Relatedly, our field has few formal training programs, limiting the ability to attract new research talent. Open science practices contribute to building the scientific infrastructure for greater collaboration, help create important learning opportunities for graduate students or research fellows, and reduce the burden of those who provide research training to develop such resources one lab or institution at a time.

2.3 | Omission in mental health research

Major research efforts such as public health surveillance studies often omit or limit assessment of eating disorders (e.g., Austin et al., 2019; Swanson, Brown, Crosby, & Keel, 2014). Such omissions may reflect the (mis)perception that eating disorders are not as pressing a problem as other mental disorders; they also may reflect a lack of knowledge about research tools that could be applied to such broad scale efforts. Open sharing of materials or data will allow eating disorder research to impact and be integrated into other disciplines. Wider application of open science practices will also help engage stakeholders from outside the research community such as public policy experts, educators, members of industry or the media, and people with lived experience. As a small field, we do not have the luxury of wasteful effort; falling behind in the evolution of open science will only amplify our field's disadvantage in access to mental health research support and impede progress toward improving the understanding, prevention, and treatment of eating disorders.

3 | EXPLAINING CORE OPEN SCIENCE PRACTICES

Figure 1 (adapted from van der Zee & Reich, 2018) illustrates where in the research cycle specific open science practices come into play. Our editorial draws upon the extensive resources made available by the Center for Open Science (https://www.cos.io). Using examples from the eating disorders field, we describe three open science practices: (a) preregistration, (b) Registered Reports, and (c) material or data sharing. Author declarations regarding conflicts of interest or funding sources are universally required in scientific journals, and author adherence to these open science practices is high (Serghiou et al., 2021). Therefore, our editorial affirms but does not further describe author declarations. *IJED* policies about open access to preprints or accepted manuscripts do not affect the review process and remain unchanged; hence, our editorial does not focus on open access to preprints or publications.

3.1 | Study preregistration

Study preregistration involves completing a time-stamped description of study aims and methods prior to commencing data collection and publishing the document in a public registry. Since 2004, the International Committee of Medical Journal Editors has required preregistration of clinical trials in a public registry (International Committee of Medical Journal Editors, 2004). Authors may choose from over 20 registries (e.g., https://www.drks.de/, https://clinicaltrials.gov/, and https://www.anzctr.org.au/). Registries

vary in scope from regional to international, and in requirements based on local laws and practices (United States Department of Health & Human Services, 2015). Consistent with proliferating governmental mandates (for review, see Cybulski et al., 2016), leading scientific journals only publish intervention studies that have been registered in a public registry prior to enrolling participants. Increasingly, funders not only require but also monitor grant recipients' compliance with trial registration and sanction those who fail to comply (e.g., The Wellcome Trust, 2021). Consequently, preregistration of prevention or treatment trials is common and is required for publication in the three major eating disorder journals: the *IJED* (e.g., König et al., 2018; Sadeh-Sharvit et al., 2018; Zhou, Pennesi, & Wade, 2020), the *European Eating Disorders Review,* and the *Journal of Eating Disorders.*

Preregistration need not be limited to intervention trials; its benefits apply regardless of study goals or design, and irrespective of whether a study utilizes newly collected versus preexisting data (Haven & Van Grootel, 2019; Mertens & Krypotos, 2019; Moore, 2016). Searches of public registries other than clinical trial registries (e.g., Open Science Foundation; Prospero), using key terms such as "eating disorders" or specific eating disorder diagnoses, identified few protocols (e.g., Solmi et al., 2021; https://osf.io/qbg2x; https://www.osf.io/bq7mn;

https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=140622), notwithstanding thousands of entries of various (noneating disorder related) studies. Based on these (admittedly unsystematic) searches, we believe that preregistration of nonclinical protocols or meta-analytical studies is still uncommon in our field. Given the dearth of preregistered studies, a journal policy requiring preregistration for nonintervention studies currently would risk serious constriction of the submission pipeline. That said, several reasons speak for encouraging authors to join the preregistration movement.

Anyone with access to the internet can register their protocol free of charge. Hence, study registration is a low-threshold and low risk opportunity to participate in the scientific enterprise. The time stamp creates a public record of when researchers introduced the protocol, thus helping to document originality of a research idea or program. Researchers can embargo the release of their protocol to protect from being "scooped." Preregistration facilitates reproducibility by describing study design and procedures. It increases transparency in that the public can ascertain whether: (a) major aspects of the study were changed to secure favorable findings (e.g., dropping participants whose findings do not support investigator expectations); (b) analyses were guided by an a priori analysis plan versus "p-hacking" (i.e., undertaking numerous analyses to find significant results; Munafò et al., 2017); (c) findings falsely were presented as expected, dubbed "hypothesizing after the results are known" or HARKing (Kerr, 1998); or (d) publications withheld key results (e.g., possibly due to negative findings).

Preregistration occurs without formal peer review, it varies considerably in the provision of methodological details, and it does not preclude flawed theoretical assumptions, methods or procedures (however well described). Whether preregistration improves transparency and reproducibility largely is a function of the quality of the provided information and the integrity of the researchers in abiding by their protocols. A growing list of resources (see

e.g., Krypotos, Klugkist, Mertens, & Engelhard, 2019) may help authors share their research protocols. As noted in a detailed guide to study registration (Benning, Bachrach, Smith, Freeman, & Wright, 2019), clinical research faces hurdles such as recruitment shortfalls, attrition, and other real-world challenges. Preregistration should map out contingency plans (e.g., decision trees), an exercise that also may help avoid potential pitfalls. Still, even with careful planning, protocol changes may become necessary and should not, a priori, be taken as proof of study inferiority. Moreover, not all protocol changes result from negative force of circumstance; for example, researchers may opt to modify a protocol in response to methodological advances (e.g., improved measurement tools, software, etc.). In conclusion, preregistration is not meant to impose undue rigidity upon researchers. Rather, preregistration is intended to compel careful study planning and documentation, along with transparency regarding any protocol changes.

3.1.1 | Author guidance—During the *IJED* submission process, authors are asked (yes/no) whether their study has been preregistered. The *IJED* requires intervention studies (except pilot work) to be registered in a public registry prior to participant enrollment. (Preregistration also is required for Registered Reports, as described later). We acknowledge that this requirement has been implemented inconsistently. Also, even when provided, placement of preregistration information has varied across manuscripts, and thus been cumbersome to find. To improve transparency, the *IJED* advises authors as follows:

1. We reaffirm that preregistration of intervention studies in a public registry prior to participant enrollment is required. We will continue not to require preregistration of pilot studies because, rather than testing specific hypotheses, typically their purpose is to evaluate the feasibility of a new intervention whose efficacy will ultimately be evaluated in a larger hypothesis-testing study (Leon, Davis, & Kraemer, 2011).
2. Preregistration of nonintervention trials is encouraged, but not required.
3. Provision of preregistration information is required for manuscripts describing findings other than the intervention outcomes, if the data being reported were collected as part of a preregistered study. Such disclosure will enhance readers' ability to appreciate the provenance of study data and the full scope of findings related to a clinical or prevention trial.
4. Authors who preregister a nonintervention study are required to provide the preregistration link or number (i.e., even though preregistration of such studies is optional, once a study has been preregistered, authors should disclose the preregistration), so that readers can determine the extent to which the authors adhered to their initial protocol and were transparent about any changes.
5. Authors should provide the preregistration information in the Method section, immediately following the statement regarding Institutional Review Board (IRB) approval. Consistent placement of preregistration in a manuscript makes it easier for readers to find this information.

6. Where study procedures or analyses depart substantially from the description in the preregistration, authors should explain the nature of and reasons for the changes in the Method section or, if extensive, in an online supplement.

7. The *IJED* will begin to issue "preregistration badges" on manuscripts describing studies that have been preregistered; the badge signals that the editor has verified public accessibility of the preregistration (https://authorservices.wiley.com/open-research/open-recognition-and-reward/open-research-badges.html).

3.1.2 | Reviewer guidance—We advise reviewers as follows:

1. The preregistration requirement applies only to intervention trials (excluding pilot studies); therefore, reviewers should not evaluate a manuscript more harshly simply because the study it describes was not preregistered. We do, however, ask reviewers to determine whether authors offer a clear description of their study as hypothesis testing (and, if so, whether hypotheses were formulated a priori) versus hypothesis generating. If authors indicate that their study tested hypotheses but was not preregistered, this should be noted as a limitation.

2. When preregistration is reported, we ask reviewers to evaluate whether the study methods are consistent with those outlined in preregistration protocols, and to determine whether any meaningful discrepancies exist that may diminish the quality of the inferences that can be derived from the study. Numerous scenarios justify design changes; reviewers should consider whether changes are accurately reported, as well as being scientifically sound. Consistent reporting of preregistration information aids readers' appreciation of the extent to which a manuscript describes findings derived from a larger or complex research effort (e.g., analyses of secondary aims). Reviewers should evaluate whether authors describe transparently the potentially multiple uses of the same dataset.

3.2 | Registered Reports

Registered Reports are comprised of two related manuscripts: Stage 1 and Stage 2. Stage 1 Registered Reports feature a fully developed study rationale and Method section and are published after scientific peer review. Stage 1 Registered Reports introduce a scientific study into the literature *before* data collection has begun or, if involving secondary data analyses, *prior to* commencing analyses. Journals offering this article format typically guarantee authors acceptance of a subsequent Stage 2 paper in which authors report and discuss the findings upon study completion. If applicable, the Stage 2 manuscript should describe and justify any changes to the Stage 1 protocol (including the analysis plan).

Given the greater level of detail and the benefits of peer review, Stage 1 Registered Reports may be superior to preregistration in facilitating transparency and reproducibility. Additionally, Registered Reports reduce publication bias toward significant findings in two ways. One, by being able to publish the study protocol, investigators gain a publication regardless of whether the study ultimately produces positive findings versus null findings, thus reducing the temptation of HARKing and p-hacking. Two, by committing to publish the Stage 2 manuscript, journals ensure that all results (versus just those supporting the study

hypotheses) are open to the public (Chambers, Feredoes, Muthukumaraswamy, & Etchells, 2014; Nelson, Simmons, & Simonsohn, 2018; Simmons et al., 2018). Recognizing these benefits, some funders now require grant recipients to not only list their intervention studies in a registry but to also publish their study protocols (The Wellcome Trust, 2021). Examples of Registered Reports of original research studies are plentiful (e.g., Bryant et al., 2020; Bulik et al., 2021; Couturier et al., 2021). Registered Reports need not be limited to studies collecting new data; for example, authors may consider publishing protocols for secondary data analyses or for meta-analyses (e.g., Hilbert et al., 2017; Proulx-Cabana et al., 2021).

3.2.1 | Author guidance—Since 2019, the *IJED* has invited Registered Reports (Appendix S1 lists all Registered Reports published in the *IJED* to date). Authors are advised as follows:

1. The *IJED* will begin accepting (though not requiring) Stage 1 Registered Reports of systematic or meta-analytical reviews.
2. The *IJED* does not accept Stage 1 Registered Reports describing analyses that may be reasonably expected to be completed as part of a complex research study (e.g., moderator or mediator analyses in intervention trials).
3. Study preregistration is required for Stage 1 Registered Reports. If the preregistration is embargoed at the time of submission, authors should attach for the editor a confidential file containing the preregistration information; the embargo must be lifted at the time of acceptance of the Registered Report.
4. Authors should indicate whether the research protocol has been funded by an extramural funding organization; this information does not influence editors' decisions about suitability of a protocol for publication. However, in cases where the review process identifies major conceptual or methodological concerns that cannot be addressed by revising the protocol because the funder will not permit changes, the manuscript likely will not be accepted for publication.
5. While IRB approval is not required at the time of submission, publication of Stage 1 Registered Reports is conditional on receipt of IRB approval for the research plan as described in the accepted manuscript.
6. If authors amend the study protocol following review of a Stage 1 Registered Report, those changes should be reflected in a revised preregistration. Alternatively, if the original preregistration cannot be updated (as is the case in some registries), a new preregistration must be created which should include the number or link to the original preregistration, thus creating a historical record of design changes.
7. The *IJED* promises in principle acceptance of Stage 2 manuscripts for Stage 1 Registered Reports that have been published in the *IJED*, provided a) the study protocol has been followed or, if changed, modifications did not undermine the study aims or scientific rigor; b) the introduction and discussion are updated reflecting the research literature at the time of submission; and c) the manuscript

is prepared consistent with the *IJED* author guidelines and quality expectations about academic writing.

8. Authors may publish their Stage 2 Registered Report in another journal, even when the Stage 1 manuscript was published in the *IJED*.

9. The *IJED* accepts for review Stage 2 Registered Reports even when the companion Stage 1 manuscript was published in another journal.

3.2.2 | Reviewer guidance—Evaluations of Stage 1 versus Stage 2 manuscripts differ, as follows:

1. At *Stage 1,* the emphasis is on evaluating the scientific premise (i.e., the proposed study is grounded in a clearly articulated theory or based on relevant prior research; it addresses an important gap in the literature) and the rigor of the proposed design and procedures. Reviewers should focus on identifying strengths and weaknesses of the proposed protocol and its potential contribution to the field, rather than prescribing specific remedies for identified weaknesses. Reviewers should assess whether the description of the study in the Registered Report is consistent with its description in the preregistration.

2. At *Stage 2,* reviewers should focus on comparing the protocol description of the Stage 1 and Stage 2 manuscripts for consistency and request corrections, if needed. Moreover, if protocol changes or unplanned analyses are reported, reviewers should evaluate whether the changes are well-justified and scientifically sound or whether the study has been compromised such that publication may not be recommended. Reviewers also should evaluate whether the Introduction has been updated given advances in knowledge since publication of the Stage 1 manuscript, as well as comment on the quality of the Discussion.

3.3 | Sharing research materials or data—Study materials and data have been characterized as a "public good," and funders of large research grants often require that investigators make these resources available free of charge and via a readily accessible repository (vs. upon request from the authors) (Huston, Edge, & Bernier, 2019; Knottnerus, 2016). Open access to materials and data supports (a) efficiencies (e.g., reuse of study materials; recognition that a research question has been answered, obviating the need for further study and attendant research expenses, unless for replication); (b) independent examination of results (reproducibility and replication); (c) development or testing of new hypotheses (via secondary analyses based on the openly available dataset); and (d) research training. By sharing their materials and data, investigators extend the lifespan and potential impact of a research project. Sharing materials can, of course, occur throughout the research cycle (see Figure 1). Indeed, Krypotos et al. (2019) advise researchers to preregister study procedures and copyright them to ensure that their intellectual work is properly recognized by others and used for noncommercial purposes.

Increasingly, journals require "availability statements" where authors describe if and how they will share materials or data, using four options: (a) no sharing, (b) sharing upon request from the corresponding author, (c) sharing as part of a published manuscript or its

supplemental files, or (d) openly sharing via public repository (Colavizza, Hrynaszkiewicz, Staden, Whitaker, & McGillivray, 2020). Compared to preregistration or Registered Reports, material or data sharing often requires considerably more resources and may be prohibitively burdensome for investigators with limited institutional resources or research funding. Not surprisingly then, several studies of journals covering mental health research have reported that while availability statements are common, the sharing of materials or data via public repositories is rare (Adewumi, Vo, Tritz, Beaman, & Vassar, 2021; Nutu et al., 2019; Sherry et al., 2020; Wallach, Boyack, & Ioannidis, 2018). Given concerns about marginalizing authors with inadequate resources for material or data sharing, and given limited uptake so far of these open science practices in scientific publishing, we believe it is premature for the *IJED* to mandate material or data sharing in open access repositories. That said, as noted earlier, there are compelling arguments for researchers to consider adopting such practices.

Research materials may include measurement instruments, experimental paradigms, intervention curricula, training materials, or study project manuals. In the open science framework, material sharing means making these work products available free of charge to the public. Of research materials types, most commonly freely available are research instruments such as the Eating Disorder Examination interview and questionnaire (Center for Research on Eating Disorders at Oxford, 2014), the Eating Disorder Assessment for DSM-5 (Sysko et al., 2015), the Eating Disorder Diagnostic Scale (Stice, Telch, & Rizvi, 2000), or the Pica, ARFID, and Rumination Disorder Interview (Bryant-Waugh et al., 2019; Dinkler & Bryant-Waugh, 2021), enabling the measurement and comparison of eating disorders symptoms across a wide range of study samples (Baceviciene, Balciuniene, & Jankauskiene, 2020; Dahlgren, Walsh, Vrabel, Siegwarth, & Rø, 2020; Mohd Taib, Abdul Khaiyom, & Fauzaman, 2021).

Most manuals for evidence-based psychological interventions to treat or prevent eating disorders have been available for purchase (Dalle Grave & Calugi, 2020; Lock & Le Grange, 2013; Simic, Baudinet, Blessitt, Wallis, & Eisler, 2021; Waller, Turner, Tatham, Mountford, & Wade, 2019) rather than via an open access format. We expect, however, that novel intervention manuals increasingly will be available for free (see, e.g., Pennesi & Wade, 2018; Runfola et al., 2018; Wallis, Prichard, Hart, & Yager, 2021), either because of funders' policies or because of authors embracing open science practices. Whether available for purchase or cost-free, manuals typically do not include contextual information required for implementing the interventions with fidelity (e.g., checklists, supervision logs/structure). Openly sharing such information will enhance transparency and dissemination.

Measuring eating behavior in the laboratory is another field-relevant example of an experimental procedure that needs to be well-documented to facilitate consistent deployment in other studies. We refer readers to a systematic review by Sysko, Steinglass, Schebendach, Mayer, and Walsh (2018) of research using a laboratory test meal paradigm; supplemental files contain detailed information about the contents of test meals and the procedures laboratory studies of eating behaviors.

3.3.1 | Sharing data—Increasingly, globally, governments require investigators who receive public funding to submit their data into a certified public archive where data then

will be made available subject to certain legal requirements (e.g., data safety and human participants considerations). Beyond the public good created by data sharing, recent research suggests a citation count advantage for articles that share data via a repository (Colavizza et al., 2020). To be useful, data archives need to include detailed information about the study methods, variables (e.g., codebook), and all steps the original researchers took to create the dataset (e.g., data cleaning, recoding, etc.). Independent examination of study findings also requires specification of statistical software packages and code. The advent of freely available, open-source statistical software (such as R, R Core Team, 2021) and code (which, in the case of R, can be easily shared through automatically generated R Markdown files) can streamline the data-sharing process. The *IJED* published a special issue on rigor and reproducibility (Hildebrandt & Crosby, 2018); several of the articles included code (Forbush et al., 2018; McCaig, Bhatia, Elliott, Walasek, & Meyer, 2018). (For additional examples of code or data sharing, see Vervaet, Puttevils, Hoekstra, Fried, & Vanderhasselt, 2021; Yan et al., 2019.)

Despite these benefits, many challenges make data sharing a daunting goal. The resources required for preparing datasets for sharing are substantial, yet rarely fully funded (Hesse, 2018; Nelson et al., 2018). Obstacles also include ethical concerns about privacy or consent (Walsh et al., 2018). For example, proper consent must be obtained to ensure full disclosure of intent to share data publicly; the impact of this disclosure on enrollment remains to be tested as individuals forfeit the ability to approve use of their data for further projects (e.g., secondary data analysis). Future use of data to answer study questions unknown to study participants at the time of enrollment may have unintended ethical consequences for informed consent. To assuage intellectual property concerns (many studies require extended periods of time for analyses to be completed), funders typically permit time for core study analyses to be conducted before requiring the data to be shared. Finally, data safety concerns arise if data storage is moved off original data servers. To date, efforts to address these concerns have involved the storage of publicly funded data in government or nonprofit supported archives (https://nda.nih.gov/; https://www.gesis.org/en/institute/departments/data-services-for-the-social-sciences) with varying levels of gate-keeping to ensure ethical use of the data by qualified individuals.

Researcher may access numerous public datasets for secondary analyses (see, e.g., https://github.com/kharrigian/mental-health-datasets). Complementing the responsibilities of researchers who prepare their data for sharing, researchers accessing a shared dataset also have a responsibility to facilitate transparency by providing detailed information about the dataset used in secondary analyses (e.g., Rossman et al., 2020). These include, where applicable, referring to the original study by name, providing links to the data archive, summarizing prior studies with similar research questions, and reporting not only the variables extracted for the secondary analyses but also noting the variables left unexamined. For example, a dataset may include multiple measures of eating disorder symptoms or include extensive data on participant characteristics, yet a secondary analysis may utilize only a subset, raising concern about cherry picking the variables best suited to find a "positive" result.

3.3.2 | Author guidance—The *IJED* advises authors as follows:

1. Authors are required to state if and how they will share materials or data.
2. The *IJED* encourages, but does not require, material or data sharing. The *IJED* will begin offering open material badges and open data badges to articles where authors opt to make their materials or data openly accessible (for details, see (https://authorservices.wiley.com/open-research/open-recognition-and-reward/open-research-badges.html).
3. When presenting findings based on public access databases, authors should provide, where applicable, (a) the name of the parent study; (b) justification for selecting subsamples (if applicable; e.g., extracting only a certain demographic group); and (c) a complete listing of study variables (in a supplement or by linking to the data archive of the parent study) to enable readers to assess whether all available variables relevant to the research question were used.

3.3.3 | Reviewer guidance—While the *IJED* does not require material or data sharing, reviewers should consider whether a manuscript provides sufficient information about study materials or data for evaluating the scientific study's merit and for facilitating independent evaluation or replication efforts.

4 | OPEN SCIENCE CREATES OPPORTUNITIES FOR INNOVATION IN EATING DISORDERS RESEARCH

Open science represents an ideal endpoint of a continuum from open (desirable) to closed (undesirable) (van der Zee & Reich, 2018), with each of the open science practices intended to move us closer to the ideal, rather than guaranteeing perfection. Moreover, "open" does not equate with "free." Open science practices require time, technological know-how, infrastructure resources, and money. As an unintended consequence, insisting that researchers adopt the open science framework without support for the costs involved risks worsening already existing inequities in research (Whitaker & Guest, 2020). Finally, academic institutions insufficiently reward open science practices (Dougherty, Slevc, & Grand, 2019; Lilienfeld, 2017). Not only is it costly in terms of investigator and staff time, but adherence to open science practices is not typically a focus in hiring, promotion, or tenure decisions, thus reducing the attractiveness of participation. Hence, on a philosophical level, open science may be easy to support as fundamental to the practice of science, yet on a practical level, there remain questions about if, when, and how open science practices should be implemented. The early stage of a "science of open science" affords an opportunity for innovation and leadership: Studies are needed that identify ethical and practical obstacles to engagement in open science (e.g., data sharing) and that test the effectiveness and costs and benefits of various strategies to overcome such obstacles. Research also is needed of the use of openly shared resources (materials, data) and how to ensure that the potential value of these resources is fully realized. Accordingly, the *IJED* invites papers for a special issue on open science where authors may showcase their skills in open science practices and develop their own framework for the scientific study of open science practices. https://onlinelibrary.wiley.com/page/journal/1098108x/homepage/cfp-os-ed.

We encourage authors—including those who may not have thought of themselves as "doing open science research" and those who may have extensive experience with open science practice but have not yet focused on eating disorders as a topic of inquiry—to develop projects suitable for publication in the special issue of open science in eating disorders research.

5 | CONCLUSIONS

A confluence of factors has led to the clear formalization of open science methods over the past several decades. Galvanized by the replication crisis in psychology and later facilitated by technological advances that have created platforms for data and materials sharing, scholars have identified exciting opportunities to democratize nearly every stage of the research process. These methods range from open sharing of study design (e.g., preregistration, Registered Reports), to open sharing of materials, data, or code, to open dissemination of findings (e.g., preprints, open access articles). The *IJED* is committed to supporting authors and reviewers in adhering to recommended practices in open science, without posing undue burdens. Some benefits of open science practices for the eating disorders field are self-evident, whereas others require further study. Many of these advances have challenged long-held beliefs (e.g., about keeping study ideas private to avoid being scooped, or keeping even de-identified data confidential), but challenging long-held beliefs is nothing if not the sine qua non of science.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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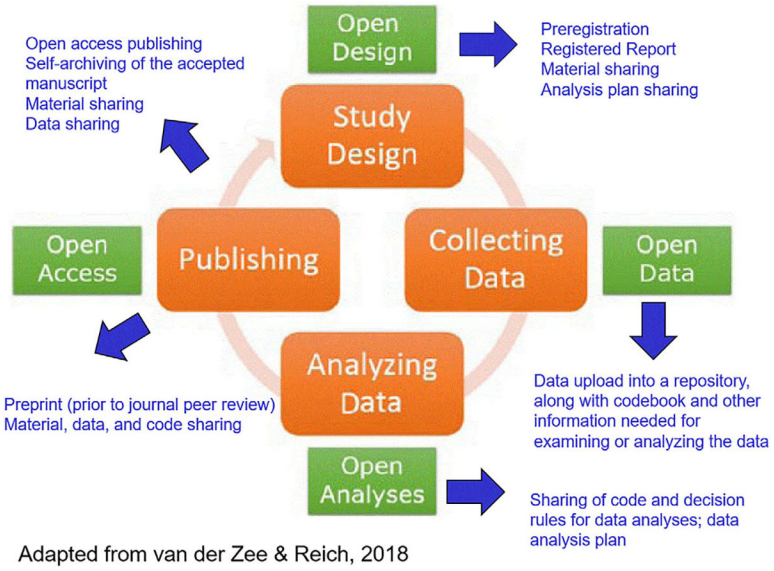

FIGURE 1.

Open research practices during the typical research cycle from study planning to publication

TABLE 1

Open science practices in the *International Journal of Eating Disorders (IJED)*

- *IJED* requires that authors indicate whether materials or data are available for sharing
- *IJED* mandates preregistration of prevention or clinical trials
- *IJED* publishes Registered Reports
- *IJED* permits sharing of preprints (manuscripts that have not yet been peer reviewed) via authors' personal webpages, author institutions' repository, or a nonprofit public repository
- *IJED* permits authors to share manuscripts that have been accepted for publication, using the same archiving methods as for preprints, after an embargo period (typically 12 months)
- *IJED* has a hybrid publishing model: Authors may select (a) open access publishing for a fee that is adjusted based on authors' country; (b) immediate open access publishing, free of charge to authors from institutions with a "transitional" agreement with the publisher; (c) delayed open access, free of charge to authors whose research was supported by funders with whom Wiley has an agreement; or (d) restricted access publishing (where the public pays for access via journal subscriptions or per article download fees)