



Differences between DSM-5-TR and ICD-11 revisions of attention deficit/hyperactivity disorder: A commentary on implications and opportunities

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Specialty type: Psychiatry

Provenance and peer review:

Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B, B
Grade C (Good): C, C
Grade D (Fair): 0
Grade E (Poor): 0

P-Reviewer: Hosak L, Czech Republic; Jiménez DR, Spain; Wang DJ, China

Received: December 16, 2022

Peer-review started: December 16, 2022

First decision: February 20, 2023

Revised: March 2, 2023

Accepted: April 18, 2023

Article in press: April 18, 2023

Published online: May 19, 2023



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Abstract

Current ICD-11 descriptions for attention deficit hyperactivity disorder (ADHD) were recently published online, in the same year as the DSM-5-TR (text revised edition) was released. In this commentary, we compare and contrast the DSM-5/DSM-5-TR and ICD-11 diagnostic criteria, summarize important differences, and underscore their clinical and research implications. Overall, three major differences emerge: (1) The number of diagnostic criteria for inattention (IA), hyperactivity (HY) and impulsivity (IM) symptoms (*i.e.*, DSM-5-TR has nine IA and nine HY/IM symptoms, whereas ICD-11 has eleven IA and eleven HY/IM symptoms); (2) the clarity and standardization of diagnostic thresholds (*i.e.*, the diagnostic thresholds for symptom count in IA and HY/IM domains are explicitly specified in DSM-5-TR, whereas in ICD-11 they are not); and (3) the partitioning of HY and IM symptoms into sub-dimensions (*i.e.*, difference in partitioning HY and IM symptom domains relates to the differences between the current and previous editions of DSM and ICD, and this has important research implications). Currently, no ICD-11 based ADHD rating scales exist and while this absence represents an obstacle for respective research and clinical practice, it also presents opportunities for research development. This article highlights these challenges, possible remedies and novel research opportunities.

Key Words: Attention deficit hyperactivity disorder; ICD-11; DSM-5-TR; Clinical implication; Diagnostic threshold; Taxonomy; Research

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Core Tip: Three major differences between DSM-5-TR and ICD-11 are: (1) The number of diagnostic criteria for inattention, hyperactivity (HY) and impulsivity (IM) symptoms; (2) the clarity and standardization of diagnostic thresholds; and (3) the partitioning of HY and IM symptoms into sub-dimensions between previous and current editions of DSM and ICD. Currently, no ICD-11 based attention deficit hyperactivity disorder (ADHD) rating scales exist. The absence of research evidence to inform and reconcile these differences represents opportunities for research. Emerging research findings suggest that 'impulsivity' is likely the key latent factor underlying different expressions of ADHD symptoms; and the current criteria merging HY/IM could limit such explorations.

Citation: Gomez R, Chen W, Houghton S. Differences between DSM-5-TR and ICD-11 revisions of attention deficit/hyperactivity disorder: A commentary on implications and opportunities. *World J Psychiatry* 2023; 13(5): 138-143

URL: <https://www.wjgnet.com/2220-3206/full/v13/i5/138.htm>

DOI: <https://dx.doi.org/10.5498/wjp.v13.i5.138>

INTRODUCTION

ICD-11 descriptions for attention deficit hyperactivity disorder (ADHD) were recently published online [1]. In addition, the DSM-5-TR[2] was published in print along with a more extended digital e-edition version. While there is greater alignment between ICD-11 and DSM-5-TR, there are nevertheless differences (albeit subtle in parts), which entail important implications for research and clinical application. This commentary paper critically distils and articulates these differences (particularly diagnostic symptoms and symptom threshold for diagnosis). As no revisions were made to the diagnostic criteria of ADHD in DSM-5-TR, the remainder of this commentary refers to DSM-5-TR instead of 'DSM-5' or 'DSM-5 and DSM-5-TR', unless otherwise specified. A more severe variant of ADHD is called hyperkinetic disorder (HKD) in ICD-10[3]. The symptom compositions for HKD in ICD-10 are comparable with the 'combined presentation' of ADHD in DSM-5-TR, but not the 'predominantly inattentive' or 'predominantly hyperactive-impulsive' presentations. The ICD-11 revision of ADHD is now more aligned with DSM-5-TR, by including less severe presentations/types other than HKD.

With reference to DSM and ICD comparisons, we first summarize the major differences between DSM-5/DSM-5-TR and ICD-11 diagnostic criteria. The implications of these differences for clinical practice and research are then discussed. To place our discussion in context, we present first a summary of DSM-5-TR and ICD-11 and compare them. By undertaking this commentary we seek to facilitate a deeper understanding and appreciation of these different, but related, classification systems, and how they contribute to better research and clinical practice.

Summary of DSM-5-TR and ICD-11

Table 1 provides a summary of DSM-5-TR and ICD-11 diagnostic criteria for ADHD in relation to their descriptions, onset, presentation patterns, and symptom criteria, with regards to settings, duration and impairment. As can be seen in Table 1, while there is much alignment between ICD-11 and DSM-5-TR, important differences exist, especially in terms of symptom composition and criteria. We will focus on these in the next section.

MAJOR DIFFERENCES BETWEEN DSM-5-TR AND ICD-11

There are at least four major differences between DSM-5-TR and ICD-11 and their previous editions that are noteworthy of consideration.

Difference in splitting one inattentive symptom criterion

First, in contrast to DSM-5-TR which lists nine inattention (IA) symptoms, ICD-11 has 11 IA symptoms. The specific DSM-5-TR IA symptom for "Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities" is split into two separate IA symptoms in ICD-11: "Lacking attention to detail", and "Making careless mistakes in school or work assignments". This gives rise to the first extra symptom.

Additional IA and hyperactivity/IMP symptoms in ICD-11

In addition, the specific DSM-5-TR IA symptom "Is often forgetful in daily activities" is also partitioned into two separate similar IA symptoms in ICD-11: "Is forgetful in daily activities" and "Has difficulty remembering to complete upcoming daily tasks or activities". This gives rise to the second extra

Table 1 Comparison of DSM-5-TR and ICD-11 diagnostic criteria for attention-deficit/hyperactivity disorder

	DSM-5-TR	ICD-11
Name	ADHD	ADHD
Onset	Some symptoms present before 12 yr	Some symptoms present before 12 yr
Symptoms	9 IA symptoms 9 HY/IM symptoms	11 or 9 IA symptoms 11 or 10 HY/IM symptoms
Presentation types/symptom criteria for children	(1) ADHD combined: At least 6 IA and 6 HY/IM symptoms; (2) ADHD predominantly inattentive: At least 6 IA symptoms; and (3) ADHD predominantly hyperactive/impulsive: At least 6 HY/IM symptoms	(1) ADHD combined: IA and HY/IM symptoms present with neither predominating; (2) ADHD predominantly inattentive: IA symptoms predominating; and (3) ADHD predominantly hyperactive/impulsive: HY/IM symptoms predominating
Presentation types/symptom criteria for persons aged ≥ 17	(1) ADHD combined: At least 5 IA and 5 HY/IM symptoms; (2) ADHD predominantly inattentive: at least 5 IA symptoms; and (3) ADHD predominantly hyperactive/impulsive: At least 5 HY/IM symptoms	
Settings	Present in at least 2 settings	Multiple settings—but symptoms may vary according to the structure and demands of the setting
Duration	≥ 6 mo	≥ 6 mo
Impairment	Social, academic, or occupational functioning	Social, academic, or occupational functioning—IA symptoms less evident in stimulating and rewarding activities and HY/IM during free-play

ADHD: Attention deficit hyperactivity disorder; IA: Inattention; HY: Hyperactivity; IM: Impulsivity.

symptom. A new IA symptom for ICD-11, not present in DSM-5-TR, is “Frequently appears to be daydreaming or to have mind elsewhere”. This is the third extra symptom. However, this symptom could be regarded as being more in line with the “sluggish cognitive tempo (SCT)” symptom when considered in light of the SCT literature[4]. In addition, the specific DSM-5-TR IA symptom “Often has trouble holding attention on tasks or play activities” is not present in ICD-11.

With reference to hyperactivity (HY)/impulsivity (IM) symptoms, ICD-11 lists 10. Two of these relate to overactive behavior: “Has difficulty sitting still without fidgeting” and “Feelings of physical restlessness, a sense of discomfort with being quiet or sitting still”. ICD-11 specifies that the former be applied to younger children, and the latter be applied to adolescents and adults (*i.e.*, age 17 years or older). These can be regarded as developmental variants of the same symptom. For this reason, there are in reality 10 HY/IM symptoms in ICD-11. The symptom of “is often ‘on the go’, acting as if ‘driven by a motor....’ experienced by others as being restless...” in DSM-5-TR is absent in ICD-11; however, this could potentially be comparable to ‘feelings of physical restlessness’ in ICD-11. A new HY/IM symptom in ICD-11, which is absent in DSM-5-TR, is “A tendency to act in response to immediate stimuli without deliberation or consideration of risks and consequences (*e.g.*, engaging in behaviors with potential for physical injury; impulsive decisions; reckless driving)”. This symptom captures the classical description of dispositional trait IM. In contrast, in DSM-5-TR, IM is solely represented by three directly observable behavioral symptoms (*i.e.*, ‘blurt out’, ‘can’t wait’ and ‘interrupt’), as an absence of deliberation or risk consideration that cannot be directly observed, but often only inferred or disclosed by the actor upon retrospective reflection.

In summary, DSM-5-TR has nine IA and nine HY/IM symptoms, whereas ICD-11 has 11 IA and 11 HY/IM symptoms (but 10 if ‘fidgeting’ in children and ‘mental restlessness’ in adults are combined as one).

Differences in partitioning of HY and IM symptom sub-dimensions

The third difference relates to previous and current editions of DSM and ICD. Specifically, whether HY and IM symptoms should be considered as separate dimensions by contrasting DSM-IV-TR[5] with DSM-5-TR, and by contrasting ICD-10 with ICD-11. Currently, in DSM-5-TR, HY and IM symptoms are considered to represent a single dimension regarding threshold for diagnosis. This means an adult will meet diagnostic threshold of the HY/IM domain regardless of whether they have HY or IM symptoms. The HY/IM threshold can be met by two different adults: One with five HY symptoms and another with mixed two HY symptoms and 3 IM symptoms. Although ICD-11 also groups HY and IM as a single dimension, diagnostic thresholds are not specified for either children or adults.

In the previous DSM-IV-TR edition, symptoms were listed separately under HY and IM subheadings. Likewise, ICD-10 contemporaneous with DSM-IV-TR also considered them separately, but with ‘talkativeness’ listed within the IM grouping. By applying the ICD-10 framework, it can be postulated that out of the 10 ICD-11 HY/IM symptoms, five symptoms are HY (‘motor activity’, ‘leaving seat’, ‘running

about', 'difficulty setting still'/'physical restlessness', and 'difficulty in not engaging in activity quietly'), while the other five symptoms ('talkativeness', 'blurt out', 'can't wait', 'interrupt', and 'immediate response without considering consequences') are IM symptoms. Recent empirical findings from factor analytic studies provide support that HY and IM symptoms should be grouped separately, and that 'talkativeness' should be grouped with IM rather than HY in line with ICD-10 configuration[6,7].

Differences in clarity and standardization of diagnostic thresholds

Fourth, the diagnostic thresholds for symptom count in IA and HY/IM domains are explicitly specified in DSM-5-TR (*i.e.*, six for each domain for children and five for each domain for adolescents/adults aged 17 or above), whereas in ICD-11 they are not.

Noting that ADHD symptoms may vary with developmental age and ADHD severity, ICD-11 states that "several symptoms" from the IA and HY/IM clusters need to be present. This approach is however consistent with the general approach used by ICD-11[8], in order to avoid arbitrary cutoffs related to symptom counts and duration; and as such, terms such as "several days", "several weeks", and "several symptoms" are used in ICD-11.

The approach used by ICD-11 is considered to be more in line with how clinicians actually make diagnoses, allowing more flexibility in exercising clinical judgment and avoiding algorithmic requirements (regarded by some as 'pseudo-precision'), such as a prescribed threshold of symptom counts. This flexibility is an innovative feature in ICD-11, and is more consistent with the dimensional classification[8]. However guidelines on how to establish thresholds are not provided in ICD-11. Therefore, when using ICD-11, the onus is placed on individual clinicians to apply their own judgement in determining clinical thresholds. The potential problems with this approach include diagnostic difficulty (especially for less experienced clinicians) and the increased heterogeneity of ADHD above and beyond that yielded by the DSM-5-TR defined ADHD diagnostic criteria.

IMPLICATIONS OF THE DIFFERENCES BETWEEN DSM-5/DSM-5-TR AND ICD-11 FOR RESEARCH AND CLINICAL PRACTICE

With reference to ADHD diagnostic criteria, the differences related to the number of criteria, the thresholds for ADHD diagnosis, and whether the HY and IM symptom groups are merged or grouped separately have a number of implications for clinical practice and research.

First, in relation to clinical practice, as mentioned previously, the thresholds for the different symptom domains are unspecified in ICD-11, thereby increasing the likelihood of greater diagnostic heterogeneity. Greater standardization generally improves diagnostic reliability, but this prescribed algorithmic approach is not adopted by ICD-11 *per se*; in contrast, ICD-11 prefers the dimensional approach. In this respect, we suggest that until clearer guidance from ICD-11 and its future revision is forthcoming, researchers using ICD-11 should be cognizant of providing very detailed descriptions of the samples (including symptom count) examined in their studies. Moreover, it is anticipated that ICD-11 will in due course release its Clinical Descriptions and Diagnostic Guidelines (CDDG). These will likely provide more operationalized diagnostic guidance for clinicians and researchers, and with more than a decade of work invested in their development[8], be 'designed to assist mental health clinicians in making a confident diagnosis'. We therefore highly recommend readers to access and study in detail the ICD-11 CDDG for more information, when it becomes available.

Secondly, for DSM-5/DSM-5-TR, questions have been raised about whether the proposed/implied two-factors (*i.e.*, IA and HY/IM dimensions) is the optimum structural model. This is because many studies that have compared different latent structural models of ADHD have reported less support for the two-factor model than for three-factor models (especially IA, HY and IM factors aligned to ICD-10 [3]. Relatedly, recent studies[7,9] have provided empirical support for the S-1 bifactor model to account for the latent factor structure of ADHD. That is, ADHD is likely a disorder predominantly driven by latent IM substrates[7] in line with the 'trait impulsivity hypothesis'[10]. In this S-1 bifactor model, 'impulsivity' is best represented by four ICD-10 IM items ('talkativeness', 'blurt out', 'can't wait' and 'interrupts') in line with the ICD-10 configuration, rather than the DSM-5-TR three IM items ('blurt out', 'can't wait' and 'interrupts'). A consistent finding in these studies is that the HY factor is poorly defined (insignificant and/or negative loadings) and lacks reliability (omega coefficient levels below 0.50). Therefore HY is observable in individuals with ADHD, the relevance of HY for ADHD at the latent trait levels is questionable.

These considerations have important research implications that can potentially be compromised by the current ICD-11 and DSM-5-TR definitions. At present we lack knowledge about the psychometric properties of ICD-11 ADHD symptoms, and therefore need to use caution when using ICD-11 for clinical practice relating to ADHD. Indeed, for this reason, some in clinical practice may question the present clinical utility of ICD-11, until greater clarity emerges.

Thirdly, the differences indicate that existing measures, such as DSM-5 based ADHD ratings scales, may not be appropriate for ICD-11 defined ADHD assessment, and that there is a need to develop new ADHD rating scales based on ICD-11. The absence of ICD-11 based rating scales for ADHD can be

considered an important obstacle for research and clinical practice using ICD-11. However, as a temporary solution, researchers could utilize the listed criteria as defined by ICD-11. Notwithstanding this, the absence of a validated ICD-11 defined rating scale, or a measurement instrument or semi-structured diagnostic tool to capture the full range of ICD-11 symptom criteria, provides opportunities for researchers to construct appropriate measures with empirically derived reliability and validity. This is important as the identification of the underlying structure will be determined not only by the clinical elements, but also by the scope of the tools that are used in its recognition. The absence of thresholds for the IA and HY/IM symptom groups in ICD-11 means that for clinicians who still wish to use ICD-11 for clinical diagnosis of ADHD, the onus is placed upon them to use their own cut-off scores to establish clinical caseness. This approach is likely to reduce inter-rater and test-retest reliability, thereby increasing the heterogeneity of ADHD beyond what we currently observe when DSM-5 ADHD diagnostic criteria are applied. Additionally, such a scenario would limit the comparability of findings across studies in which the diagnostic caseness is based on ICD-11. It is also conceivable that the failures of DSM-5-TR and ICD-11 in classifying and partitioning HY/IM symptoms into respective HY and IM subdimensions will dissuade researchers from further exploring the three-factor structure of ADHD (*i.e.* IA, HY and IM three subdimensions), or the S-1 bifactor modelling in which different patterns of partitioning HY and IM symptoms are evaluated[7].

Another issue relevant to research and clinical practice here is biomarkers. The World Federation of Societies of Biological Psychiatry and the World Federation of ADHD previously concluded that there is still no reliable biomarker for ADHD[11]. Nevertheless potential promising candidates should be further explored[12,13]. When the roles of different biological markers become established, they may play a role in improving diagnostic precision and reducing heterogeneity, and may contribute towards differentiating the validity and utility of DSM-5-TR and ICD-11 with respect to their differences as identified in this review.

CONCLUSION

In this commentary, we have articulated the differences in diagnostic criteria of ADHD between DSM-5-TR and ICD-11 and the implications of these differences for clinical practice and research. The major differences were noted in symptom composition and diagnostic thresholds for the IA and HY/IM domains. The clinical and research implications of these include: (1) The current lack of rating scales and measurement tools to capture the full spectrum of ICD-11 symptom items; and (2) the lack of standardized diagnostic threshold for the IA and HY/IM symptom domains in ICD-11, with ensuing problems for validity, reliability and increased heterogeneity. Moreover, the lack of distinction between HY and IM symptoms run contrary to recent empirical findings and limit future opportunities to explore the three-factor or S-1 bifactor modelling of IA, IM and HY as key components in the latent structure of ADHD. In closing, this commentary seeks to provide clinicians and researchers with a succinct summary of the issues, as well as important insights, regarding the clinical and research implications of the recent changes in DSM-5-TR and/or ICD-11.

FOOTNOTES

Author contributions: Gomez R reviewed the literature and drafted the manuscript; Chen W conceived the idea for the manuscript, reviewed the literature and revised the manuscript; Houghton S reviewed the literature and revised the manuscript.

Conflict-of-interest statement: Nil. Wai Chen served as a reviewer for the DSM-5 Clinical and Public Health Committee during the DSM-5 revision; but this role did not and has not led to any conflict of interest.

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S-Editor: Fan JR

L-Editor: A

P-Editor: Chen YX

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