Clinicians’ Use of the International Classification of Sleep Disorders: Results of a National Survey

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Objective: To determine clinicians’ patterns of use of the International Classification of Sleep Disorders (ICSD) and their ratings of its utility and organization.

Methods: A telephone survey was conducted in one clinician practicing at each of 206 sleep centers accredited by the American Academy of Sleep Medicine (AASM). Descriptive analyses were performed, and ratings for various sleep classifications were compared with ANOVA and post-hoc tests.

Results: Clinicians at 230/251 (92%) of contacted centers agreed to participate, and data from 206/251 (82%) were actually collected. The ICSD was used by 91.7% of clinicians for clinical decision making but by lower percentages for billing or medical record keeping. Features of the ICSD pertaining to clinical descriptions and differential diagnosis were rated as most useful. The Association of Sleep Disorders Centers (ASDC) classification was rated more highly than ICSD in organization and ease of use.

The ICSD and ASDC systems were rated more highly than other sleep disorders classifications in terms of organization, “fit” to patients, and ease of use.

Conclusions: The ICSD is used widely by clinicians, primarily for diagnostic purposes, and is preferred over more general sleep disorders classification systems. However, more favorable ratings for the ASDC compared to ICSD indicate the value clinicians place on easy-to-use, symptom-oriented classifications.

Keywords: sleep disorders, diagnosis, classification, International Classification of Sleep Disorders, Diagnostic and Statistical Manual of Mental Disorders


INTRODUCTION

THE CLASSIFICATION OF MEDICAL DISORDERS AND DISEASES SERVES MANY PURPOSES: to describe patients; to facilitate communication between professionals; to predict clinical course and treatment response; to anchor clinical and basic research; and for billing. Although these multiple purposes often work in concert, this is not always the case. For instance, research studies often benefit from narrowly defined, homogeneous groups of patients, but in clinical settings, diagnostic categories that provide broad coverage for more heterogeneous patients are desirable. Ideally, the classification of medical disorders is based on unambiguous etiology or pathology. In the absence of such features, diagnostic categories are based on clinical features, physiological measurements, clinical utility, expert opinion, and consensus. In this latter situation, which applies to most sleep disorders, information about how clinicians actually use a classification system provides an important gauge of the system’s success and of how well clinicians are using available clinical tools.

The clinical classification of sleep disorders is not a new development. In a typically prescient description, Kleitman outlined disorders resulting from “Interference with Sleep and Wakefulness” (e.g., environmental disruptions, sleep deprivation) and disorders arising from “Spontaneous changes in the sleep-wake rhythm” (e.g., narcolepsy, hypersomnias, insomnia). More modern sleep disorder classification systems include the Diagnostic Classification of Sleep and Arousal Disorders (DCSAD) of the Association of Sleep Disorders Centers—Association for the Psychophysiological Study of Sleep (ASDC-APSS); the International Classification of Sleep Disorders (ICSD); the International Classification of Diseases (ICD-9CM); and the Diagnostic and Statistical Manual of Mental Disorders (DSM-IIR and DSM-IV). The diagnostic categories for each of these systems are based on a combination of empirical data, expert opinion, and consensus rather than specific etiologies or pathology. Unfortunately, data are very sparse regarding the reliability, validity, and utility of any of these classifications or their specific disorders.

Information regarding patterns of use of the ICSD is important for several reasons. First, such information can be used to evaluate the clinical utility of the classification. Second, patterns of use can inform the revision of the ICSD classification, recently begun by the AASM, by indicating potential difficulties in applying the system in clinical practice. Third, it provides a measure of how consistently sleep disorders clinicians are using the clinical tools available to them.

In order to address these issues, the Nosology Committee of the AASM conducted a survey of clinicians at accredited sleep laboratories in the United States. The specific goals of this study were: 1) to identify current patterns of use of the ICSD among sleep disorders clinicians; 2) to identify specific features of the ICSD that clinicians find more and less useful; and 3) to compare clinicians’ ratings of the organization and utility of ICSD and other sleep disorders classifications.

METHODS

The Nosology Committee designed a national survey to address patterns of use of the ICSD. In order to obtain a broad sampling of clinicians at different clinical facilities, the survey included one clinician at each of the sleep disorders centers accredited at that time by the AASM.
in the United States. A telephone survey format was chosen because this format routinely obtains higher response rates than alternative methods, such as mail surveys. The AASM contracted with the Wisconsin Survey Research Laboratory (WSRL) to refine the survey instrument and to conduct the actual study.

Prior to the telephone survey, a letter was sent to the director of each sleep center explaining the goals and methods of the study and soliciting cooperation. The AASM provided the WSRL with the names and telephone numbers of accredited sleep centers. Interviewers made calls to each laboratory in order to establish contact with a clinician. Answers to questions were entered directly into a computer database by the interviewer. Telephone interviews lasted approximately 30 minutes and were conducted between August and October 1996.

The survey instrument was developed by members of the Nosology Committee and revised with feedback from the WSRL and from data in pilot interviews. Specific content areas included: 1. descriptive information on the respondent; 2. information regarding the number of new and follow-up patients seen at the sleep center, the number of polysomnograms performed, and the age of most patients; 3. the specific sleep disorders classification system(s) used at the center; 4. the specific ways in which the ICSD was used (e.g., clinical decision-making, medical records, billing); 5. ratings of the utility of specific features of the ICSD; 6. information concerning the clinician’s familiarity with and use of other sleep disorders classifications; and 7. preferences regarding the organization of sleep disorders classifications. A complete copy of the survey instrument is available upon request from the first author.

Most results of the survey are presented in terms of descriptive statistics. Kruskal-Wallis one-way ANOVAs (which yield χ² values) were performed to compare the median ranks among sleep disorders classifications on specific items pertaining to organization, diagnostic “fit,” and ease of use. For post-hoc pair-wise comparisons among systems, we used the Kruskal-Wallis multiple-comparison Z-value test; a critical threshold value of 2.64 corresponded to a p value of 0.025.

RESULTS

Response Rates, Respondent Demographics, and Sleep Center Practices

A total of 251 sleep disorders centers were accredited by the AASM at the time of the survey. Of these, 230 (92%) agreed to participate. Surveys were completed in 206 centers, for an overall response rate of 82%. For the remainder of the sample, appointments could not be scheduled during the timeframe of the study. Of the respondents, 93% were certified by the American Board of Sleep Medicine, 84% were physicians, and 71% worked with at least one other sleep disorders specialist in their center. Primary specialties were determined for 185 (90%) of respondents. Of these, 45.4% listed pulmonary medicine, 25.4% neurology, 14.1% psychology, and 7.6% psychiatry as their primary specialty. The mean number of new patients seen per year was 517 (median 435, range 80-2623), mean number of follow-up visits 710 (median 545, range 0-3388), mean number of overnight polysomnograms performed 626 (median 513, range 71-2500), and mean number of multiple sleep latency tests 101 (median 51, range 2-900). Patients were predominantly adults; at 76% of sleep centers, adults comprised more than 85% of the patient population, and only 6% of centers reported that patients under 12 years of age or 12-18 years of age comprised more than 10% of patients.

Current Patterns of ICSD Use

All but one center reported owning a copy of the ICSD. One hundred eighty-nine (91.7%) of the respondents indicated that they used the ICSD for making clinical diagnoses, and 39.5% said they used it “most of the time” or “always” for this purpose. By comparison, 83.5%, use ICSD for medical record-keeping, 69% for billing, and 62% for maintaining a patient database. Of the 84 diagnoses included in the ICSD, the median estimate of the number of diagnoses actually used in respondents’ clinical practices was 15.

Utility of Specific Features of the ICSD

The survey asked respondents to rate the usefulness of 11 different features of the ICSD on a 5-point scale (1=not at all useful, 5=very useful). Table 1 lists these features and their ratings for usefulness in clinical practice. Those parts of the ICSD emphasizing diagnostic features and differential diagnoses were rated as most useful, and severity and coding features the least useful.

In addition to rating the usefulness of specific parts of the ICSD, respondents were asked in an open format what they most liked about the ICSD. The four most common responses were: thoroughness or comprehensiveness, categorization or organization of diagnoses, clear or specific diagnostic criteria and help with differential diagnoses, and description of disorders and narrative text. Respondents were also asked what they liked least about the ICSD. The five most common responses were: organization of diagnoses; diagnoses not listed or patient does not fit into existing categories; hard to find information; inflexibility, not user-friendly; and redundancy or more information than necessary.

Clinicians’ Ratings of Diagnostic System Organization and Utility

In order to compare clinicians’ use of the ICSD with other sleep disorders classifications, the survey also assessed their familiarity with and use of these other systems. Specifically, respondents were asked about their experiences with the ASDC classification, the ICD-9CM and ICD-10, DSM-IIIR, and DSM-IV. Following the ICSD, clinicians were most familiar with the ASDC classification, although few actually used any classification besides the ICSD in their clinical practices.

We determined clinicians’ ratings of the organization of each classification, how well it “fit” their patients, and how easy it was to use. For the first two questions, responses ranged from 1 (very poor) to 5 (excellent). For ease of use, the four responses were “very easy,” “somewhat easy,” “somewhat difficult,” and “very difficult.” Data for these questions are shown in Figure 1 for those classifications that were being used by at least 10% of clinicians. The data were calculated only for the number of respondents who indicated familiarity with the particular system. ANOVAs on median ratings of “organization of sleep disorder categories and diagnoses” showed a significant difference among systems (χ²=63.2, df=3, p=0.001). Post-hoc comparisons of the median values for each system showed that the organization for ASDC was rated significantly higher than all other systems, that the ICSD was rated significantly more highly than ICD-9CM and DSM-IV, and that ICD-9CM and DSM-IV did not differ. Data for “fit” of diagnoses also showed a significant difference among systems (χ²=127.2, df=3, p<0.001). Post-hoc tests showed no difference between ASDC and ICSD, both of which were rated more favorably than ICD-9CM and DSM-IV, and no difference between ICD-9CM and DSM-IV. With regard to “ease of use,” the four systems again differed globally (χ²=62.4, df=3, p<0.001). The

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*Each item was rated on a scale of 1-5, with 1 indicating “not at all useful” and 5 indicating “very useful.” Columns in the table indicate the percentage of responses with 4 or 5 rating, and with a 1 or 2 rating, followed by the rank ordering within that column.

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ASDC was rated significantly better than all the other systems, ICSD was rated better than ICD-9CM and DSM-IV, and the final two did not differ from each other.

Finally, survey participants were asked to rank-order several alternative methods for organizing categories of sleep disorders. Specifically, they were asked to rank-order the methods that correspond to ASDC, DSM-IV, ICD-9CM, and ICSD systems. In contrast to the above analyses, the ICSD received the highest median rank, followed by the ASDC, DSM-IV, and ICD-9CM. The ANOVA indicated a significant difference in median ranks ($\chi^2=103.0, df=3, p<0.00001$). In this direct comparison, the ICSD-type system was ranked significantly better than the other systems, the ASDC-type system was rated more highly than the ICD-9CM or DSM-IV organizational patterns, and the final two did not differ.

DISCUSSION

Data regarding clinicians’ use of any disease classification are sparse. This report is the first to examine how clinicians’ use the ICSD, the sleep disorders classification endorsed by the AASM and other professional sleep societies. Major findings from this survey of 206 sleep disorders specialists were: 1. More than 90% of clinicians use the ICSD for clinical decision making, but lower percentages use it for billing or medical record-keeping; 2. Features of the ICSD that clinicians found most useful were those pertaining to clinical descriptions and differential diagnosis; 3. The organization and ease of use of the ICSD were rated better than those of ICD-9CM and DSM-IV, but not as highly as those of the ICSD’s predecessor, the ASDC classification. These findings have implications for standardization of practice in sleep disorders medicine and for ongoing revisions to sleep disorders classifications.

The high level of use of the ICSD is in itself not surprising, since use of the ICSD is required for center accreditation by the AASM. Features that clinicians found particularly useful were mainly those associated with clinical description, diagnosis, and differential diagnosis. The use of specific diagnostic criteria are likely to improve standardization of clinical practice. However, this survey did not address the question of whether clinicians actually use the specific diagnostic criteria (as opposed to the diagnosis itself), and if they do, whether they apply these criteria reliably. Previous studies have shown good interrater reliability when using structured diagnostic interviews for sleep disorders. However, when sleep disorder diagnoses are made using standard clinical interviews, interrater agreement is much lower. The perceived utility of diagnostic criteria needs to be supplemented by training to ensure their consistent use.

Aspects of the ICSD pertaining to coding instructions were rated as less useful. One surprising item in the latter group was that pertaining to severity. These low ratings may reflect disagreements with the specific method for rating severity, difficulty with applying the severity criteria, or a lack of relevance to clinical decision making. Future revisions to the ICSD will need to re-examine severity ratings to ensure that they are anchored to treatment or outcome data and that they are sufficiently “user-friendly” for clinical practice.

Preferences for the ASDC system over the ICSD in terms of organization and ease of use raise more important questions regarding the utility of each system. These results appear to reflect a preference for the more intuitive symptom-based approach of the ASDC, as opposed to the more complex etiology-based format of the ICSD. This apparent paradox may have a reasonable explanation: that they prefer an etiologically based classification in theory, but the simpler organization and greater ease of use of a symptom-based classification are preferable in practice. In other words, the ASDC system may match clinicians’ experience of how patients present (e.g., with complaints of insomnia, hypersomnia, or unusual behavior during sleep) and may be easier to use on this basis. On the other hand, when the clinician must think about etiology of the sleep complaint (e.g., a problem related to intrinsic sleep problems, external factors, or medical illness) organization like that of the ICSD may be more useful. One final possibility, less related to the classifications themselves, may be a cohort effect, e.g., clinicians trained in earlier years may have preferred the ASDC system. Unfortunately, we do not have data to confirm or refute this hypothesis. In any case, the fact remains that a reasonably large number of clinicians still used the ASDC system in 1996. Their preference for this system, strong enough to warrant keeping separate databases in many cases, should be considered in revising the sleep nosology.

Revisions to diagnostic criteria and disease classifications must be determined by several factors. The current study addresses some of these, e.g., how well a system is accepted, how it is used in clinical practice, and what parts are particularly useful or not useful to clinicians. However, the major factor involved in revising diagnostic criteria must be empirical data regarding diagnostic reliability, validity, and relationships to outcome data. An example is the development of research criteria for sleep-disordered breathing developed by the AASM. Another example is the revised diagnostic criteria for restless legs syndrome and periodic limb movements.

Establishing usable and empirically supported diagnoses and diagnostic classifications is of more than heuristic importance. Clinicians make different treatment recommendations for patients with different specific diagnoses. For example, they make different treatment recommendations for different specific insomnia diagnoses, even when these diagnoses differ in rather subtle ways. The reliable assignment of diagnoses is essential to determine how actual treatment response differs among patients.

Finally, some caveats must be noted. The sample size was relatively small and included only clinicians at AASM accredited sleep disorders centers in the United States. Whether their responses are representative of the larger sleep disorders community is unknown. The majority of respondents saw adult patients almost exclusively. Practices of clinicians in centers with larger pediatric practices remain to be determined. More importantly, we did not have adequate samples of particular specialty backgrounds (e.g., pulmonary medicine vs. neurology vs. psychiatry vs. psychology) to determine how this might have influenced attitudes toward various classification systems or what parts of a diagnostic system were specifically being evaluated. Likewise, the survey did not assess clinicians’ ratings of specific diagnoses within the ICSD or other classification systems. The response rate for the survey was comparable to that expected in telephone surveys. However, most responses were
based on participants’ reports and opinions and were not verified with data collected prospectively or from existing databases. Data regarding actual diagnostic practices in sleep disorders centers have been collected to update and extend the Coleman et al 1982 study. These data, together with the results of the present report, will be used in planning future revisions of the ICSD.

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