SDIS-R

Sleep Disorders Inventory for Students-Revised

Summary of SDIS-R Features

SDIS-R DESCRIPTION	
PRODUCT NAME	Sleep Disorders Inventory for Students – Revised
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BRIEF PRODUCT DESCRIPTION	The SDIS – R is the same as the original SDIS except it is offered on a convenient digital Internet platform, and it has more Medical History Questions added. It is a quick, but thorough screening instrument designed to determine if a child or adolescent has a high probability of a major sleep disorder that requires treatment. It is accessible on a digital platform at www.SleepInventory.com for both parents and professional practices, clinics, hospitals, school districts, etc. If a professional uses these services, s/he simply enrolls the practice on line and pays for a certain number of screenings at a highly reduced fee per screening (This highly reduced fee is provided with the goal to make it affordable for every child coming to a professional practice to receive a screening since these major sleep disorders have such a negative impact on a child/teen's cognition, learning and achievement, behaviors, health and safety.). To facilitate the screening, a link can be sent to each parent/guardian before an appointment requesting that they use the link to screen their child. The SDIS – R has separate forms for children, ages 2 yrs.-10 yrs. (SDIS-R-Children's Form), and adolescents, ages 11 yrs.-18 yrs. (SDIS-R-Adolescent Form), which are completed by a parent or guardian who knows the child or adolescent's daytime and nighttime sleep habits well. In the case of screening an adolescent, it is recommended that the parent and adolescent rate the items together for more accuracy. Record forms are available in English, and coming soon on our digital platform, Spanish. The SDIS-R-C and SDIS-R-A contain 30 and 35 daytime and nighttime behavior questions plus 24 Medical History questions. They can be completed in 10-20 minutes depending on the rater's reading speed and knowledge of the child or adolescent.

COMPUTERIZED SCORING SOFTWARE	The SDIS-R software is designed for quick, easy scoring (takes only ~3-5 seconds once the rater submits their scores). The moment the results are generated, the parent/guardian can download the results, and the professional practice requesting the screening receives an email of the results. If the parent seeks a screening independently, then no professional practice is notified. The software produces a graph and comprehensive report of each case with intervention or treatment options that professionals and parents find extremely helpful. The software/digital platform is also designed to preserve large amounts of cases for each professional practice to access for research or tracking purposes.
PRIMARY USE/PURPOSE	The SDIS – R should be used to screen any child or adolescent who is suspected of having sleep problems. Especially all children/teens who experience obesity, developmental delays, school attendance problems, learning or behavior problems, asthma or allergies, and dental malocclusions (crooked teeth, over- or under-bites, narrow jaw, recessive chin, etc.) should be screened for sleep disorders because research indicates that these populations are at higher risk of having a major sleep disorder or a significant airway breathing problem that can cause sleep apnea. After treatment/correction many of the learning, behavior and health problems disappear or improve significantly. The SDIS – R is NOT designed to make a sleep diagnosis, but to identify children/youth with a high probability of a sleep disorder who may need to be referred to a medical specialist (dentist, pediatrician, sleep specialist, etc.) to correct many of these problems. There are a couple sleep disorders screened by the SDIS – R that are behavioral sleep disorders, and in these cases parents will be provided home interventions, which are usually successful if consistently used at home.
RECORD FORM AGE RANGES	SDIS-R-Children's Form: 2 yrs. through 10 yrs. SDIS-R-Adolescent Form: 11 yrs. through 18 yrs.
USER QUALIFICATIONS	The SDIS – R has been designed for use by any professional working with children/teens. Our users include school and clinical psychologists, dentists, orthodontists and dental hygienists, pediatricians, nurse practitioners, psychiatrists, school counselors, school nurses, social workers, sleep specialists, etc... The accurate, thorough computer software scoring and report-writer program provides the professional and parents the needed knowledge to know whether the student is at higher risk of having a major sleep disorder and needs to be referred for more help. Professionals report that the SDIS – R is easy to use and very helpful in their practices.

Summary of SDIS-R Features

CONTENT DESCRIPTION	
GLOBAL SCALE	Both the SDIS-R-Children's and SDIS-R-Adolescent Forms provide a Total Score. It is called the Sleep Disturbance Index (SDI).
SUBTEST SCALES	The SDIS-Children's Form provides four (4) subscales. The SDIS-Adolescent Form provides five (5) subscales.
SCALE NAMES	The SDIS-R-Children's Form scales: (1) Sleep-Related Breathing Disorder (SRBD) (2) Periodic Limb Movement Disorder (PLMD) (3) Excessive Daytime Sleepiness (EDS), and (4) Delayed Sleep Phase Syndrome (DSPS), sometimes referred to as Behavioral Insomnia of Childhood (BIC) in younger children. The SDIS-Adolescent Form scales: (1) Sleep-Related Breathing Disorder (SRBD) (2) Periodic Limb Movement Disorder / Restless Legs Syndrome (PLMD/RLS) (3) Excessive Daytime Sleepiness (EDS) (4) Delayed Sleep Phase Syndrome (DSPS), and (5) Narcolepsy (NARC). Not included in the scoring, the SDIS-R-C and SDIS-R-A provide information and interventions if a parent indicates that their child has problems with: (1) Bedwetting (nocturnal enuresis) (2) Night terrors (sleep terrors) (3) Sleep-walking (sonambulism), (4) Sleep-talking (somniloquy), and (5) Teeth grinding (bruxism) Both inventories ask 24 Medical History questions that are not included in the scoring, but provide additional information relating to a Sleep-Related Breathing Disorder and possible causes.
MATERIALS	Record forms are online and scoring / generation of the graph and report is automatically produced and retrieved online. No materials needed.

Summary of SDIS-R Features

VALIDATION PROCESS OF THE SDIS-R	
ITEM DEVELOPMENT **CONTENT VALIDATION**	A large pool of questions were selected, written and re-written by a panel of well-known pediatric professionals to screen for the major sleep disorders that children and adolescents most frequently experience. This Content Validation Committee was composed of nine members: six who were nationally respected sleep specialists; the seventh is an Asian-American Professor and is considered a national expert in the development of inventories and questionnaires; the eighth and ninth were school psychologists, one who is African-American, and one who is Hispanic-American, both considered highly knowledgeable experts in the use of testing and screening instruments. The latter three experts evaluated the SDIS and SDIS - R on its' measurement and psychometric qualities, as well as ensuring that it contained no improper wording or bias toward members of their cultures. Here is a brief summary of the experts' qualifications (in alphabetical order): 1. W. McDowell Anderson, M.D., Pulmonologist and the Director of the Sleep Clinics at James A. Haley VA Hosp. and Tampa General Hosp. in FL. He was former President of the Southeastern Sleep Disorders Association; (2) Christine Acebo, Ph.D., Professor of Instrumentation and Methodology in Statistics and Mathematics at Brown Univ. and Bradley Sleep Research Lab at E.P. Bradley Hosp. in Providence, R.I. Dr. Acebo has authored many professional articles on sleep disorders; (3) Mary A. Carskadon, Ph.D., Professor of Neuro and Biobehavioral Science, Sleep Deprivation, and Biological Rhythms at Brown Univ. and Director of the Sleep Research Lab at E.P. Bradley Hosp. in Providence, R.I. Dr. Carskadon was the co-developer of the Multiple Sleep Latency Test (MSLT) used to help diagnose narcolepsy and sleep deprivation. She is former President of the Sleep Research Society, Editor of the Encyclopedia of Sleep and Dreaming, and author of many professional articles on Narcolepsy, Delayed Sleep Phase Syndrome, and sleep deprivation; (4) Gahan P. Falone, Ph.D., Clinical Psychologist and Professor of Neurophysiology at Brown Univ. He has authored numerous professional journal articles on sleep disorders; (5) William C. Kohler, M.D., Pediatric Neurologist and former Medical Director at the Sleep Center in Billings, MT. At the time of the SDIS development, he was Director of the Pediatric Sleep Center at Univ. Community Hosp. in Tampa, Fl. Dr.

	Kohler has written numerous journal articles on sleep disorders and other neurology topics; (6) Amy Wolfson, Ph.D., Professor of Psychology at the College of Holy Cross in Worchester, MA. She has authored numerous professional journal articles on Excessive Daytime Sleepiness (EDS), DSPS, and Insomnia; (7) Madabi Chatterji, Ph.D., Professor of Measurement, Evaluation, and Education at Columbia Univ. She has published numerous professional articles on measurement, educational evaluation, and the development of survey instruments, including a university textbook entitled Designing and Using Tools for Educational Assessment (2003). Dr. Chatterji's country of origin is India, and therefore, she not only helped develop the Likert-scale scoring format used in the SDIS, but also gave feedback on the language clarity of SDIS items for Asian-American readers; (8) Debra Rose, Ph.D., Assistant Professor of School Psychology at the Univ. of South Florida and a School Psychologist in the Hillsborough County, FL School District in Tampa. Dr. Rose rated the SDIS items for cultural bias and clarity from the viewpoint of an African-American reader; (9) Rosa Assing-Tucker, Ph.D., bilingual School Psychologist in the Hillsborough County, FL School District in Tampa. She helped translate the SDIS questions and rated the SDIS items for cultural bias and clarity from the viewpoint of a Hispanic reader. (10) A Hispanic hospital professional, who was not part of the content validation team, but who translates medical information from English to Spanish, also helped with the translation of questions. Unfortunately her name has been misplaced. **There was 94% agreement by the six sleep specialists on which items should be included in the SDIS (94% Content Validity), which is very high for a screening instrument.** This Spanish version of the SDIS – R is coming in the Summer, 2019.
ITEM RATING SCALE	Items are rated by parents using a specific, well-defined 7-point likert scale. The items range from a third-to-fifth grade reading level so that most parents can easily read and comprehend the items.
NORMING SAMPLES **GENDER**	Participants included 821 total children and adolescents from 2 yrs. through 18 yrs. They came from 45 schools, two psychology private practices, and seven pediatric sleep centers nationwide, six of which were American Academy of Sleep Medicine (AASM) accredited sleep centers. Pilot study used 226 subjects. Main Study Sample: 595 subjects: 359 (60.34%) Males 246 (39.66%) Females

RACE / ETHNICITY	Caucasian (White): 442 (74%) African American: 59 (10%) Hispanic: 51 (9%) Multi-Cultural: 30 (5%) Asian-American: 12 (2%) Other: 1 (0.17%) Race, ethnicity, socio-economic status and parent educational levels were reflective of the 2010 U.S. Census.
GEOGRAPHIC REGIONS	Subjects were obtained from the Southeast, Mid-Atlantic, Central, and Western Regions of the U.S.A.
PEDIATRIC SLEEP CENTERS	Pilot Study Centers: All Children's Hospital, St. Petersburg, FL, Sleep Specialist: Juan Martinez, MD Tampa General Hospital, FL; Sleep Specialists: W. McDowell Anderson, MD & Selim Benbadis, MD Main Study Centers: Carle Regional Sleep Disorders Center, Urbana, IL; Sleep Specialist: Daniel Picchietti, MD Johns Hopkins Pediatric Sleep Centers, Baltimore, MD; Sleep Specialist: Ann Halbower, MD Miami Children's Hosp., FL; Sleep Specialist: Marcel Deray, MD Stanford Sleep Disorders Clinic, CA; Sleep Specialists: Rafael Pelayo, MD and Emmanuel Mignot, MD, PhD University Community Hospital, Tampa, FL; Sleep Specialist: William Kohler, MD
VALIDATION PROCESS: **EXPLORATORY FACTOR ANALYSIS (EFA)**	A Pilot Study was first conducted with exploratory factor analysis to determine the structure of the inventory, the possible sleep disorders it is measuring, and eliminate poor items. This Pilot Study consisted of data collected from 226 students from the Pasco County, FL School District, two psychology private practices in the Tampa Bay, FL area, All Children's Hospital Sleep Clinic, FL and Tampa General Hospital Sleep Clinic in Fl. - It was determined that some items needed to be deleted because they did not discriminate well enough between children with and without sleep disorders. - It was also determined that two separate norming groups had to be used in the main study to develop two record forms: the SDIS-R-Children's Form and SDIS-R-Adolescent Form because it was noted statistically during EFA that there were significant differences between these two age groups in which questions were sensitive and the severity level for scoring.

CONFIRMATORY FACTOR ANALYSES (CFA)	The Main Study CFA had 595 students participating from both the Clinical Hospital Samples and the Community samples (45 schools and 2 private practices). - In the children's age group from 2 yrs. through 10 yrs., four factors (scales) could be confirmed (see scales above). > 0.90 Fit on all Subscales. - For the adolescent age group (11 yrs. through 18 yrs.) five factors could be confirmed (>0.90 Fit on all Subscales).
DISCRIMINATE FUNCTION ANALYSES (DFA)	DFA was conducted on the children and adolescent groups separately, both having subjects with a diagnosed sleep disorder, and those without a sleep disorder (community sample) to determine the items that were the best predictors of each of these major sleep disorders, as well as those without a sleep disorder. Only the items with moderate-to-high predictive validity (accuracy, such as sensitivity and specificity) were used.
OVERALL HIT RATE (Predictive Validity)	SDIS-R-Children's Form: 86% (moderately high) SDIS-R-Adolescent Form: 96% (very high)
SENSITIVITY	SDIS-R-C Total SDI Score: 0.82 (good) SRBD: 0.91 (high); PLMD: 0.50 (poor); BIC/DSPS: 1.0 (very high); EDS: Not a sleep disorder, but a consequence of a sleep disorder. SDIS-R-A Total SDI Score: 0.81 (good) SRBD: 0.92 (high); PLMD/RLS: 0.55 (poor); DSPS: 1.0 (very high); NARC: 0.88 (very good); and EDS: N/A
SPECIFICITY	SDIS-R-C Total SDI Score: 0.95 (high) SRBD: 0.62 (fair); PLMD: 0.93 (high); BIC/DSPS: 0.98 (very high); EDS: N/A SDIS-R-A Total SDI Score: 0.95 (high) SRBD: 0.92 (high); PLMD/RLS: 0.91 (high); DSPS: 0.98 (very high); NARC: 0.97 (very high); and EDS: N/A
INTERNAL CONSISTENCY	SDIS-R-C Total SDI Score: 0.91 (high) SRBD: 0.90 (high); PLMD: 0.85 (good); BIC/DSPS: 0.76 (adequate); EDS: N/A SDIS-R-A Total SDI Score: 0.92 (high) SRBD: 0.88 (very good); PLMD/RLS: 0.85 (good); DSPS: 0.71 (adequate); NARC: 0.92 (high); and EDS: N/A
TEST-RETEST RELIABILITY	SDIS-R-C: 0.97 (very high) SDIS-R-C: 0.86 (very good)