

Publication Summary Form

PRODUCT DESCRIPTION	
PRODUCT NAME	SDIS - SLEEP DISORDERS INVENTORY FOR STUDENTS
AUTHOR	MARSHA LUGINBUEHL, PHD, NCSP
COPYRIGHT DATE	2004
BRIEF DESCRIPTION OF PRODUCT	<p>The SDIS - Sleep Disorders Inventory for Students is a brief screening measure designed to determine if a child or adolescent has a high probability of a major sleep disorder that requires treatment.</p> <p>The SDIS has separate forms for children, ages 2 yrs.-10 yrs. (SDIS-Children's Form), and adolescents, ages 11 yrs.-18 yrs. (SDIS-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 Spanish. The SDIS-C and SDIS-A contain 25-30 items plus 10 general health questions and can be completed in 5-10 minutes. The SDIS software is designed for quick, easy scoring (takes ~3-5 minutes) by any professional or their secretary. The software produces a graph and comprehensive report of each case with referral or intervention recommendations that professionals and parents find extremely helpful. The software program is also designed to preserve large amounts of cases for research or tracking purposes.</p>
PRIMARY USE/PURPOSE	The SDIS should be used to screen any child/adolescent who is suspected of having sleep problems. Especially all children/teens experiencing obesity, developmental delays, school attendance problems, learning, or behavior problems should be screened for sleep disorders because research indicates that these populations are at higher risk of having a sleep disorder that may be causing or exacerbating these other problems. This instrument is NOT designed to make a sleep diagnosis, but to identify children/youth with a high probability of a sleep disorder who need to be referred to a sleep specialist.
AGE RANGE COVERED	SDIS-Children's Form: 2 years through 10 years SDIS-Adolescent Form: 11 years through 18 years
USER QUALIFICATIONS	The SDIS is designed for use by any professional working with children/teens, especially pediatricians, nurse practitioners, psychiatrists, school and clinical psychologists, counselors, school nurses and social workers, etc... The accurate, thorough computer software scoring and report-writer program provides the professional and parents the needed knowledge to know whether the student needs to be referred to a sleep specialist or can be provided behavioral interventions by the professional doing the screening. All professionals report that the SDIS is easy to use and very helpful in their practices.

CONTENT DESCRIPTION	
GLOBAL SCALES	The SDIS-Children's and SDIS-Adolescent Forms provide a Total Score.
SUBTEST SCALES	The SDIS-Children's Form provides four (4) subscales. The SDIS-Adolescent Form provides five (5) subscales.
SCALE NAMES	<p>The SDIS-Children's Form measures (1) Obstructive Sleep Apnea Syndrome (OSAS), (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.</p> <p>The SDIS-Adolescent Form measures (1) Obstructive Sleep Apnea Syndrome (OSAS), (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).</p> <p>The SDIS-C and SDIS-A also provide information and intervention ideas if a parent indicates that their child has problems with bedwetting (nocturnal enuresis), night terrors (sleep terrors), sleep-walking (sonambulism), sleep-talking (somniloquy), or teeth grinding (bruxism).</p>
FORMS	The SDIS-C and SDIS-A each have one form completed by a parent or guardian. In the case of the SDIS-A, the adolescent and parent should score it together to ensure more accuracy.
MATERIALS INCLUDED IN THE SDIS START-UP KIT (REQUIRED FOR USE)	<ul style="list-style-type: none"> • 2 packets of SDIS Record Forms (25 records per packet and buyer can choose either Children's Forms, Adolescent Forms or one packet of each). • SDIS CD Rom scoring/report-writer software • SDIS Technical Manual (included on CD software for downloading)
ITEM INFORMATION	
	<p>A large pool of items for the SDIS were selected by a panel of renown pediatric sleep specialists to screen for the major sleep disorders that children and adolescents most frequently experience. Then computerized exploratory and confirmatory factor analyses, as well as discriminate function analyses were conducted on large samples of children and adolescents with and without sleep disorders to determine the items that were the best predictors of these major sleep disorders. Only the items with moderate or high predictive validity (accuracy) were used.</p> <p>Items are rated by parents using a specific, well-defined 7-point likert scale. The reading level of the items range from a third-to-fifth grade reading level so that most parents can easily read and comprehend the items.</p> <p>Two Hispanic professionals (a bilingual school psychologist experienced in translating behavior rating scales, and a hospital professional who translates medical information) have translated the record forms from English to Spanish and concur on the translation of the items.</p>

SCORING INFORMATION	
SCORING OPTIONS	The record forms should be scored using the SDIS scoring/report-writer software to ensure accuracy of scoring and produce the proper interpretations and recommendations. Hand-scoring directions are provided in the Technical Manual on the CD Rom software, but using this process is NOT RECOMMENDED because it is much more time-consuming, subject to errors, and does not provide a helpful, informative report and graph, which parents love.
DERIVED SCORES AVAILABLE	SDIS-C: One total score and four subscale scores are provided. SDIS-A: One total score and five subscale scores are provided.
NORM GROUPS	There are separate norming groups for the SDIS-C and SDIS-A. No significant differences were found in subscale scores for males and females or for Hispanics compared to the total norming samples that closely reflected the 2000 U.S. Census demographics.
INTERPRETIVE FEATURES	The Total Score and Four or Five Subscale scores yield a <i>T-Score</i> and a <i>Percentile Rank</i> , which are classified into one of the following categories of sleep: <ul style="list-style-type: none"> • Normal Sleep • Caution Range of Sleep (child/teen is exhibiting some sleep problems that need close monitoring or might need treatment now or in the future) • High Risk of a Sleep Disorder (This category indicates that there is an 86% chance on the SDIS-C and more than a 90% chance on the SDIS-A that the child/teen has a major sleep disorder needing medical treatment or behavioral interventions.
COMPUTERIZED SCORING	The SDIS software may be used for the following: <ul style="list-style-type: none"> • Entering item responses for scoring and producing a comprehensive report and graph of results. • Previewing, printing, and/or saving individual scores, graph summaries, and reports in a data bank for later access and review, or to preserve large groups of research data.
TECHNICAL AND SAMPLE INFORMATION	
STANDARDIZATION DESCRIPTION	Items for the SDIS originated from a pool of items generated from extensive research on pediatric sleep disorders and recommendations and rating of items from renown pediatric sleep specialists in 2001. Participants included 821 total children and adolescents 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.
DATE	Developed between 2000 and 2003 and copyrighted in 2004.

TECHNICAL AND SAMPLE INFORMATION															
SIZE	The sample included 821 total children and adolescents; 602 were in the school/community sample and had not undergone a sleep evaluation; 219 were in the clinical sample and were undergoing a comprehensive sleep evaluation at a pediatric sleep center or had already been diagnosed with a sleep disorder. Initially there was a Pilot Study with 226 participants in 2001-'02 followed by a Main Study sample of 595 participants in 2002-2003.														
GENDER OF MAIN STUDY SAMPLE	Male Participants: 359 (60.34%) Female Participants: 236 (39.66%)														
RACE / ETHNICITY	<table border="0"> <tr> <td>Caucasian (White): 443 (74.58%)</td> <td rowspan="7">This sample is fairly representative of the 2000 U.S. Census Demographics except there were slightly more Multi-Cultural and slightly less African-American and Hispanic participants than in the 2000 U.S. Census, but the differences were not significant.</td> </tr> <tr> <td>African American: 59 (9.93%)</td> </tr> <tr> <td>Hispanic: 47 (7.91%)</td> </tr> <tr> <td>Multi-Cultural: 30 (5.05%)</td> </tr> <tr> <td>Asian-American: 11 (1.85%)</td> </tr> <tr> <td>Native-American: 2 (0.34%)</td> </tr> <tr> <td>Other: 2 (0.34%)</td> </tr> </table>	Caucasian (White): 443 (74.58%)	This sample is fairly representative of the 2000 U.S. Census Demographics except there were slightly more Multi-Cultural and slightly less African-American and Hispanic participants than in the 2000 U.S. Census, but the differences were not significant.	African American: 59 (9.93%)	Hispanic: 47 (7.91%)	Multi-Cultural: 30 (5.05%)	Asian-American: 11 (1.85%)	Native-American: 2 (0.34%)	Other: 2 (0.34%)						
Caucasian (White): 443 (74.58%)	This sample is fairly representative of the 2000 U.S. Census Demographics except there were slightly more Multi-Cultural and slightly less African-American and Hispanic participants than in the 2000 U.S. Census, but the differences were not significant.														
African American: 59 (9.93%)															
Hispanic: 47 (7.91%)															
Multi-Cultural: 30 (5.05%)															
Asian-American: 11 (1.85%)															
Native-American: 2 (0.34%)															
Other: 2 (0.34%)															
DEMOGRAPHICS OF SAMPLES CONTINUED	The Main Study samples reflected the SES (income level) and Parent Educational levels of the 2000 U.S. Census Demographics.														
GEOGRAPHIC REGIONS	Samples were obtained from the Southeast, Mid-Atlantic, Central, and Western Regions of the U.S.A.														
PEDIATRIC SLEEP CENTERS	<p><u>Pilot Study Centers:</u> All Children's Hospital, St. Petersburg, FL, assisted by Juan Martinez, MD Tampa General Hospital, Tampa, FL, assisted by W. McDowell Anderson, MD</p> <p><u>Main Study Centers:</u> Carle Regional Sleep Disorders Center, Urbana, IL, assisted by Daniel Picchietti, MD Johns Hopkins Pediatric Sleep Center, Baltimore, MD, assisted by Ann Halbower, MD Miami Children's Hospital, Miami, FL, assisted by Marcel Deray, MD Stanford Sleep Disorders Clinic, Stanford, CA, assisted by Rafael Pelayo, MD and Emmanuel Mignot, MD, PhD University Community Hospital, Tampa, FL, assisted by William C. Kohler, MD</p>														
EDUCATIONAL CLASSIFICATIONS OF STUDENTS	<p>Main Study Students in School: 412; Regular Ed. (including Gifted): 273 (66%); Special Ed.: 139 (34%) (More students were in Special Education because a high number of students with sleep disorder diagnoses were placed in Special Education programs before this study began).</p> <table border="0"> <tr> <td>Regular Education (excluding Gifted):</td> <td>204 (49.5%)</td> </tr> <tr> <td>Specific Learning Disabilities:</td> <td>75 (18.2%)</td> </tr> <tr> <td>Speech/Language Impaired:</td> <td>67 (16.3%)</td> </tr> <tr> <td>Gifted:</td> <td>69 (16.7%)</td> </tr> <tr> <td>Developmentally Delayed:</td> <td>26 (6.3%)</td> </tr> <tr> <td>Emotionally Handicapped or Behaviorally Disturbed:</td> <td>24 (5.8%)</td> </tr> <tr> <td>Other Programs (MR, PI, VI, DHH, Autism, OI, etc.)</td> <td>12 (2.9%)</td> </tr> </table>	Regular Education (excluding Gifted):	204 (49.5%)	Specific Learning Disabilities:	75 (18.2%)	Speech/Language Impaired:	67 (16.3%)	Gifted:	69 (16.7%)	Developmentally Delayed:	26 (6.3%)	Emotionally Handicapped or Behaviorally Disturbed:	24 (5.8%)	Other Programs (MR, PI, VI, DHH, Autism, OI, etc.)	12 (2.9%)
Regular Education (excluding Gifted):	204 (49.5%)														
Specific Learning Disabilities:	75 (18.2%)														
Speech/Language Impaired:	67 (16.3%)														
Gifted:	69 (16.7%)														
Developmentally Delayed:	26 (6.3%)														
Emotionally Handicapped or Behaviorally Disturbed:	24 (5.8%)														
Other Programs (MR, PI, VI, DHH, Autism, OI, etc.)	12 (2.9%)														

RELIABILITY	
CONTENT VALIDITY	0.94 (high)
Overall Hit Rate (THAT PATIENT HAS A MAJOR SLEEP DISORDER)	SDIS-Children's Form (n=412): 86% (moderately high) SDIS-Adolescent Form (n=180): 96% (very high)
SENSITIVITY (POSITIVE IDENTIFICATION OF A MAJOR SLEEP DISORDER)	<p><u>SDIS-C Total:</u> 0.82 (good) SDIS-C Subscales: OSAS: 0.91 (high); PLMD: 0.50 (fair); BIC/DSPS: 1.0 (very high); EDS: Not a disorder</p> <p><u>SDIS-A Total:</u> 0.81 (good) SDIS-A Subscales: OSAS: 1.0 (very high); PLMD/RLS: 0.55 (fair); DSPS: 1.0 (very high); NARC: 0.88 (good); and EDS: N/A (not a sleep disorder)</p> <p>* It is believed that the PLMD sensitivity for both the SDIS-C and SDIS-A would have been significantly higher if actigraphy had been used in the sleep studies instead of PSG (More validation studies are needed on the PLMD subscales with actigraphy).</p>
SPECIFICITY (POSITIVE IDENTIFICATION THAT THERE IS <u>NOT</u> A SLEEP DISORDER)	<p><u>SDIS-C Total:</u> 0.91 (high) SDIS-C Subscales: OSAS: 0.62 (fair); PLMD: 0.93 (high); BIC/DSPS: 0.98 (very high); EDS: Not a sleep disorder, but a variety of sleep disorders cause EDS</p> <p><u>SDIS-A Total:</u> 0.95 (very high) SDIS-A Subscales: OSAS: 0.92 (high); PLMD/RLS: 0.91 (high); DSPS: 0.98 (very high); NARC: 0.97 (very high); and EDS: N/A (not a sleep disorder)</p>
CONFIRMATORY FACTOR ANALYSES	SDIS-C: > 0.90 (Good Fit on all subscales, which means that the subscales are predicting the sleep disorders that they claim to predict. SDIS-A: > 0.90 (Good Fit on all subscales)
INTERNAL CONSISTENCY	<p><u>SDIS-Children's Form (n=412):</u> 0.91 (high) SDIS-C Subscales: OSAS: 0.90 (high); PLMD: 0.85 (good); BIC/DSPS: 0.76 (adequate); EDS: 0.84 (good)</p> <p><u>SDIS-A Total:</u> 0.92 (high) SDIS-A Subscales: OSAS: 0.88 (good); PLMD/RLS: 0.85 (good); DSPS: 0.71 (adequate); NARC: 0.92 (high); and EDS: 0.83 (good)</p>
TEST RETEST RELIABILITY	SDIS-Children's Form: 0.97 (very high) SDIS-Adolescent Form: 0.86 (good)
TRAINING OPTIONS AVAILABLE	Some professional development options include in-service training on pediatric sleep disorders and the SDIS by the author, Marsha Luginbuehl, PhD (phone: 307-886-9096), or a Pearson Measurement Consultant can be contacted for more information/training.