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EMPIRICAL VALIDATION OF THE INSOMNIA SEVERITY INDEX IN PRIMARY CARE SETTINGS

Gagnon C, Bélanger L, Ivers H, Morin CM
Universite Laval, Quebec, QC, Canada

Introduction: Although insomnia is a prevalent complaint with significant consequences for health and quality of life, it often remains undiagnosed and untreated in primary care settings. Brief, reliable, and valid instruments are needed to facilitate the screening of insomnia in general practices. This study examined psychometric indices of the Insomnia Severity Index (ISI) to identify individuals with clinically significant insomnia in primary care settings.
Methods: A sample of 410 patients (60.4% women; mean age of 47.9) recruited from six general medical clinics completed the ISI, a 7-item self-report questionnaire assessing the nature, severity, and impact of insomnia (total score ranging from 0 to 28). A subsample of 101 individuals also completed a clinical interview administered by telephone, which included the Insomnia Diagnostic Interview. Convergence between ISI total score and the diagnosis derived from the interview was investigated. Receiver operator characteristic analyses were used to determine the optimal ISI cut-off score that correctly identified individuals with an insomnia disorder.
Results: Of those who completed the interview, 33.7% (n= 34) received a diagnosis of insomnia. The area under the ROC curve was 0.87 (95% CI: 0.80-0.94). A cut-off score of 14 was optimal (82.4% sensitivity, 82.1% specificity and 82.2% agreement) for detecting clinical level of insomnia. The agreement between the ISI and the diagnostic interview was moderate (k= 0.62).
Conclusion: These findings suggest that the ISI is a valid screening instrument for detecting insomnia among patients consulting in primary care settings. Further validation examining response patterns as a function of medical and physical comorbidity would be useful.

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COMPARISONS OF THREE PRACTICAL FIELD DEVICES USED TO MEASURE PERSONAL LIGHT EXPOSURES AND ACTIVITY LEVELS

Figueiro M, Rea MS
Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, USA

Introduction: The Dimesimeter was designed to be a small, unobtrusive, and user-friendly research tool to collect personal light exposures and activity levels over multiple days and nights. The Dimesimeter is calibrated in terms of the photopic luminous efficiency function and the spectral sensitivity of the circadian system.
Methods: The measurement characteristics of the Dimesimeter and those of the Actiwatch Spectrum, a widely accepted device used for ambulatory monitoring of light and activity are presented. Also presented are light and activity data from 12 healthy older adults who wore Dimesimeters at three different locations on the body for five consecutive days. Subjects also wore the Actiwatch Spectrum and the Daysimeter, a previously documented device that measures corneal light exposures and activity levels.
Results: Activity trends measured with the Actiwatch Spectrum and the Dimesimeter devices are similar, but some small, systematic differences were observed. Compared to a commercial grade illuminance meter, significant photometric errors can occur when using the Actiwatch Spectrum to measure common light sources. Dimesimeter measurements of circadian light stimulus on three locations on the body (wrist, torso and chest) were similar to those obtained with the Daysimeter (eye level).
Conclusion: The Dimesimeter is a user-friendly device that can provide useful estimates of circadian light exposures when worn in the field.
Support (If Any): National Institute on Aging (R01AG034157) and National Institute on Drug Abuse (DA023822-01).

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ACCURACY, SENSITIVITY, AND SPECIFICITY OF A WRIST ACTIGRAPHY ALGORITHM FOR SLEEP/WAKE AND WASO AS COMPARED TO POLYSOMNOGRAPHY

Marino M[1], Li Y[2], Rueschman M[3], Winkelman J[4,5], Ellenbogen JM[4,6], Solet JM[4,7], Dulin H[3], Berkman L[8], Buxton OM[3,4]
[1]Department of Biostatistics, Harvard School of Public Health, Boston, MA, USA, [2]Department of Biostatistics, University of Michigan, Ann Arbor, MI, USA, [3]Department of Medicine, Brigham and Women's Hospital, Boston, MA, USA, [4]Division of Sleep Medicine, Harvard Medical School, Boston, MA, USA, [5]Department of Psychiatry, Brigham and Women's Hospital, Boston, MA, USA, [6]Department of Neurology, Massachusetts General Hospital, Boston, MA, USA, [7]Department of Medicine-Massachusetts General Hospital, Cambridge Healh Alliance, Cambridge, MA, USA, [8]Harvard Population Center, Harvard School of Public Health, Cambridge, MA, USA

Introduction: Published validation studies for existing wrist actigraphy algorithms currently in use are limited. We sought to determine the overall accuracy (epoch-level sensitivity and specificity, and night-level wake after sleep onset [WASO]) of a commonly-used algorithm in a variety of subjects.
Methods: Actigraphy (AW-64 and Spectrum uni-dimensional wrist accelerometers, Philips/Respironics; medium sensitivity, Cole-Kripke algorithm) and PSG were collected simultaneously during inpatient sleep laboratory visits of young and older adults, healthy sleep restricted subjects, chronic primary insomniac (PI) patients, and nightworkers during daytime sleep (n= 77, age 35.0±12.5, 30 F, mean nights= 3.2±3.0). All studies involved 8.5 hr Time in Bed except sleep restriction. Epochs (30-second; n=232,849) were characterized for Sensitivity (actigraphy=sleep when PSG=sleep), Specificity (actigraphy=wake when PSG=wake), and Accuracy (total proportion correct); WASO was assessed by night. A generalized estimating equation (GEE) model included age, gender, insomnia diagnosis, and daytime/nighttime sleep timing factors, providing an unbiased estimation of population-averaged regression coefficients.
Results: Overall Sensitivity (0.965), Specificity (0.329), and Accuracy (0.863) were only slightly modified by gender and day/night sleep timing (magnitude of change <0.04). Sensitivity, specificity, and accuracy in participants without insomnia, controlling for age, sleep timing and gender (0.967, 0.331, 0.869, respectively), were slightly different than PI patients (0.946, 0.347, 0.833). Age had no meaningful impact on the sensitivity of actigraphy, but demonstrated a minimal effect on the specificity and accuracy as age increased. Mean WASO per night was 49.1 minutes by PSG compared to 36.8 minutes by actigraphy (Spearman rank correlation, r_s=.61, p<0.0001; regression coefficient β= 0.81; CI= 0.42, 1.21).
Conclusion: These findings provide a comprehensive validation study confirming that a current algorithm provides generally accurate results for determining sleep and wake patterns. These data describe specific limitations for specificity (wake estimation) and an empirical bound to estimates of sleep, wake, and WASO when using actigraphy.
Support (If Any): This was not a device industry-sponsored study. Kennedy Shriver National Institute of Child Health and Human Development (Grant # U01HD051217, U01HD051218, U01HD051256, U01HD051276), National Institute on Aging (Grant # U01AG027669), the National Heart, Lung and Blood Institute (R01HL107240), Office of Behavioral and Science Sciences Research, and National Institute for Occupational Safety and Health (Grant # U01OH008788, U01HD059773), and General Clinical Research Center grant M01-RR02635. Grants from the William T. Grant Foundation, Alfred P Sloan Foundation, and the Administration for Children and Families have provided additional funding. The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of these institutes and offices. Special acknowledgement goes to Extramural Staff Science Collaborator, Rosalind Berkowitz King, Ph.D. and Lynne

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