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## OBITUARY

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### Avi Sadeh, DSc (1957–2016)

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Professor Avi Sadeh, a pioneer in the field of pediatric sleep and actigraphy, died on September 19, 2016. Dr. Sadeh earned his BA in psychology and MA in clinical psychology at Haifa University (Israel), and his DSc from the School of Medicine, The Technion–Israel Institute of Technology, with Dr. Peretz Lavie. He completed a postdoctoral fellowship with Dr. Mary Carskadon at Brown University (Providence, Rhode Island) before joining the faculty at Tel Aviv University (Israel) in 1992, where he was a professor of clinical psychology. Dr. Sadeh was one of the world's leaders in the field of pediatric sleep, publishing over 150 scientific papers and book chapters.

Dr. Sadeh was among the first researchers to establish actigraphy as a valid way to estimate sleep-wake patterns. His pioneering work included the development of the Sadeh algorithm, which continues to be widely used today. He also incorporated actigraphy into many of his own research studies, from newborns to adolescents.

In 1993, Dr. Sadeh published a model of infant sleep disturbances from a systems perspective. This guiding framework shaped his research and clinical work, and resulted in many of his well-known measures. This includes the Brief Infant Sleep Questionnaire (BISQ), a well-validated measure of infant and toddler sleep. The BISQ has been translated into over 20 languages and utilized in studies around the world. Dr. Sadeh also had the vision of how

important the Internet would be to research, and from the earliest validation study he demonstrated that the BISQ could be completed via the Internet.

Dr. Sadeh's early theoretical model also suggested the role of parent cognitions and parent–infant mediating factors. This model contributed to the development of the Infant Sleep Vignettes Interpretation Scale, which has been used in a number of research studies highlighting how parental (both mother and father) cognitions about infant sleep directly and indirectly predict an infant's actual sleep behaviors. This model also contributed to the examination of the role of fathers' involvement in caregiving on infant sleep and to the development of the Parental Involvement Questionnaire.

In 2010, Dr. Sadeh and his colleagues published a review paper that further refined his transactional model of infant sleep and parenting. His interests continued to expand to encompass infant crying as a factor that impacts parent sleep-related cognitions and behaviors. As a result, Dr. Sadeh developed an objective measure of parental tolerance for infant crying. Using a novel paradigm, crying tolerance was assessed by measuring response time to a video of a distressed baby. Results from this work showed that parents of sleep-disturbed infants appear to have a lower tolerance for infant crying. This finding highlights an important factor that may contribute to excessive parental involvement in soothing infants to sleep, which may contribute to the development or maintenance of infant sleep problems.

Because cultural factors also play a role in infant and toddler sleep, Dr. Sadeh's recent work included studies of cross-cultural differences in sleep in young children and their mothers. With samples in the tens of thousands, Dr. Sadeh and his colleagues have demonstrated significant differences in sleep patterns and parent-perceived sleep problems between those who live in predominantly Caucasian and predominantly Asian countries or regions.

Dr. Sadeh was also an avid developer of behavioral interventions for sleep problems in young children. In 1993 he established the Center for the Treatment of Child Behavioral Sleep Disorders in the Department of Psychology at Tel Aviv University. Together with clinical psychology students whom he supervised, he treated hundreds of families who presented with infant and child sleep problems. He was also the first to develop an Internet-based intervention for infant and toddler sleep disturbances. This work was further developed and expanded and has since been disseminated in over 20 languages, both as an Internet-based intervention and as a smart-phone app. Dr. Sadeh was adamant that empirically supported interventions like this should be freely available to all parents, irrespective of economic ability.

Another area of focus for Dr. Sadeh was the relationship among sleep, behavior, emotion regulation, cognitive functioning, and psychopathology in school-aged children and adolescents. In 2003 he published a landmark study in pediatric sleep, demonstrating that modest sleep restriction or sleep extension ( $\pm 1$  hr difference for only three nights) resulted in significant differential effects on neurobehavioral functioning. This was the first experimental study in school-aged children highlighting how even small changes to a child's typical sleep duration can have a large impact on their development.

During the last few years, Dr. Sadeh conducted several large-scale longitudinal studies, which were still ongoing at the time of his death. The first study focuses on assessing the impact of brief interventions for infant sleep problems on secondary outcomes and exploring parental and infant predictors of the efficacy of these interventions. The second project assesses the efficacy of an Internet-based intervention aimed at promoting healthy sleep habits for kindergarten children, and incorporates an assessment of improvements in

cognitive, behavioral, and health domains as well as sleep outcomes. The final study explores the role of parental cry reactivity and responsiveness in the development of infant behavior regulation in such domains as sleep, affect regulation, and effortful control during the first two years of life.

Although much of his work was in the area of pediatric sleep, Dr. Sadeh was also a brilliant clinical child psychologist, with extensive experience treating children with various emotional and behavioral problems. He combined different theoretical backgrounds to provide his patients with evidence-based treatments that were individually tailored. He also was passionate about helping children manage the trauma and stress of war. Dr. Sadeh's Huggy-Puppy intervention encouraged young children residing in a sheltered camp during the second Israel-Lebanon war to care for a needy Huggy-Puppy doll (Hibuki in Hebrew) that was given to them as a gift. This innovative intervention, published in the journal *Pediatrics* in 2008, reduced significant postwar stress reactions in hundreds of young children. Since the initial study, more than 50,000 of the plush toys have been distributed to Israeli communities. In addition, the Huggy-Puppy intervention has been extended to helping children cope after exposure to other stressful events, including nighttime fears and parental divorce. In 2011, a shipment of Huggy-Puppies was delivered to Japan to help children cope after the devastating tsunami.

Outside of academia, Dr. Sadeh was dedicated to helping children and their parents get a good night's sleep. He authored *Sleeping Like a Baby*, published first in Hebrew in 1999 and then in English by Yale University Press. Dr. Sadeh was also committed to sharing scientific and clinical knowledge to the public through countless community lectures and media interviews, as well as contributing to a popular children's television program. A few months before his death, Dr. Sadeh published a charming children's book. Written in rhyme, the story is about Shimshon, a little boy who loves to sleep, but cannot because each night a different family member wants to spend time with him. Throughout the story Shimshon explains to his family why it is so important for him (and other children) to sleep. This special book embodies Dr. Sadeh's love for children, his deep belief in their strength and intelligence, his talent for writing, his sense of humor, and his expertise in pediatric sleep.

Dr. Sadeh was an exceptionally dedicated mentor, who supervised 70 master's level students, 15 doctoral students, and 2 postdoctoral fellows at Tel Aviv University. In addition to his students in Israel, Dr. Sadeh mentored trainees from around the world. He was a caring teacher, providing support, advice, and guidance whenever needed. While always expecting the highest-quality scientific work, Dr. Sadeh conveyed his expectations in a respectful, kind, and gentle manner, building confidence in his students as they transitioned to becoming independent researchers. His legacy lives on in his many students who followed his path, combining research and clinical work in academic settings, as well as other students who went on to become licensed clinical psychologists. But beyond his scientific and clinical mentorship, he most importantly led by example, inspiring his students and other mentees with his own ability to balance high-caliber science, clinical work, family life, and personal hobbies.

Along with influencing the next generation of sleep researchers and clinicians, Dr. Sadeh was a colleague in the truest sense of the word, favoring collaboration over competition. He personally collaborated with researchers and groups from around the world, including the United States, United Kingdom, Switzerland, Japan, Singapore, China, and Australia, among many others. In addition, he encouraged global researchers to work together, often providing the necessary introductions that resulted in successful partnerships.

As a visionary he was one of the first to launch a listserv of any kind, creating the Pediatric Sleep Listserv in 1997. For the next 19 years he continued to moderate this forum for clinicians and researchers, which included 571 subscribers from around the globe. Dr. Sadeh served on the board of directors of the International Pediatric Sleep Association, an association organized to promote basic and applied research, promote teaching programs, and provide public education in all areas of sleep in infants, children, and adolescents. He also served as an associate editor for the *Journal of Sleep Research*, and was on the editorial board for *Sleep Medicine Reviews* and *Sleep*.

Anyone who had the good fortune of knowing or working with Dr. Sadeh knows how important his family was to him, and how dedicated he was to them. He is survived by his wife, Yael, daughters Adi (a lawyer) and Roni (studying veterinary medicine in Italy), son Gil (an electrical engineer), father David, brother Yosi, and his beloved grandchildren, Noga (6 years), Shahar (4 years), and Zohar (2 years).

There are so many ways that Dr. Sadeh will be remembered. We will always think of his calm, genuine, warm, humble, and thoughtful personality; his curiosity, intelligence, creativity, and passion for life; as well as his special smile and heart of gold. We miss him every day as both a colleague and a close friend, and know that he will be greatly missed by the children, families, students, colleagues, and others around the world whose lives he touched, directly or indirectly, throughout his career.