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Long-term sleep disturbances in children: a cause of neuronal loss.

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Abstract

Short-**term sleep** loss is known to cause temporary difficulties in cognition, behaviour and health but the effects of persistent **sleep** deprivation on brain development have received little or no attention. Yet, severe **sleep** disorders that last for years are common in children especially when they have neurodevelopmental disabilities. There is increasing evidence that chronic **sleep** loss can lead to neuronal and cognitive loss in children although this is generally unrecognized by the medical profession and the public. Without the restorative functions of **sleep** due to total **sleep** deprivation, death is inevitable within a few weeks. Chronic **sleep** disturbances at any age deprive children of healthy environmental exposure which is a prerequisite for cognitive growth more so during critical developmental periods. **Sleep** loss adversely effects pineal melatonin production which causes **disturbance** of circadian physiology of cells, organs, neurochemicals, neuroprotective and other metabolic functions. Through various mechanisms **sleep** loss causes widespread deterioration of neuronal functions, memory and learning, gene expression, neurogenesis and numerous other changes which cause decline in cognition, behaviour and health. When these changes are **long**-standing, excessive cellular stress develops which may result in widespread neuronal loss. In this review, for the first time, recent research advances obtained from various fields of **sleep** medicine are integrated in order to show that untreated chronic **sleep** disorders may lead to impaired brain development, neuronal damage and permanent loss of developmental potentials. Further research is urgently needed because these findings have major implications for the treatment of **sleep** disorders.

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