Effect of sleep and stress in voice functioning among college professors. A case study in a Colombian university

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Keywords: sleep quality; stress; voice acoustic analysis; college professors

Introduction

Sleep duration [1] and stress have been linked to general health outcomes. On the one hand, an inadequate sleep duration has negative effects on human functioning and may cause fatigue, affecting the voice performance [2]. On the other hand, stress can lead to adverse physiological, emotional, cognitive, or behavioral consequences [3]. An increased odd of reporting a voice disorder when stress is experienced has been previously pointed out [4]. However, to the best of the author´s knowledge no research has still assessed the possible effect of sleep and stress in voice functioning in a college professor. Therefore, we performed a case study in a Colombian university with the aim of determining the relationship between sleep time and stress with three voice acoustic parameters (fundamental frequency, standard deviation of fundamental frequency, and standard deviation of vocal sound pressure level).

Methods

Case study of one college professor followed during 15-days. During the follow-up, daily self-reports from sleep quality and stress, along with daily voice records and sleep time measures were collected. We used Generalized Linear Models with Gamma Distribution to determine the relationship between sleep and stress with three voice acoustic parameters (fundamental frequency, standard deviation of fundamental frequency, and standard deviation of vocal sound pressure level).

Results

During a 15-days follow-up, fundamental frequency on connected speech increased very slightly when the participant reported longer sleep time (Figure 1) and decreased very slightly when the participant reported higher stress (B= 0.02 and -0.04, respectively) (Table 1). There was not a statistically significant association between standard deviation of fundamental frequency or standard deviation of sound pressure levels with stress or sleep.

Discussion

There is a very small, although significant, association between sleep time and self-reported stress with a reduction of fundamental frequency in connected speech. This reduction has been previously reported on people under stressful situations such as speaking in public [5]. From these results, we may conclude that hours of sleep and stress at work play an important role on voice production. Therefore, workplace vocal health promotion programs may want to include information on these aspects. However, since this is a case study, future research including bigger sample sizes are needed to confirm these results.

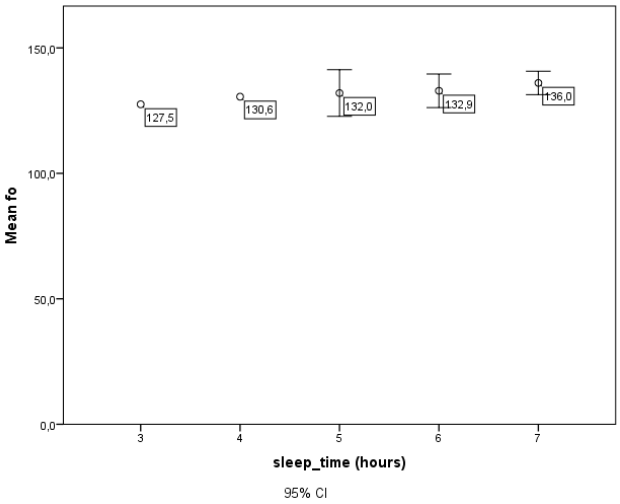

Figure 1. Relation between sleep time in hours and mean fundamental frequency

Parameter	UNIVARIATE MODEL			MULTIVARIATE MODEL		
	B	SE	p-value	B	SE	p-value
Sleep quality	0,00	0,02	0,95			
Sleep time	0,02	0,01	0,01	0,02	0,00	0,00
Stress	-0,03	0,01	0,01	-0,04	0,01	0,00

SE= Standard error

Table 1. Associations between sleep time, sleep quality and stress with fundamental frequency

Acknowledgements

We would like to express our sincerest gratitude to the professor who kindly participated in this investigation.

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