Cues of fatigue: effects of sleep deprivation on facial appearance


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Abstract

STUDY OBJECTIVE:
To investigate the facial cues by which one recognizes that someone is sleep deprived versus not sleep deprived.

DESIGN:
Experimental laboratory study.

SETTING:
Karolinska Institutet, Stockholm, Sweden.

PARTICIPANTS:
Forty observers (20 women, mean age 25 ± 5 y) rated 20 facial photographs with respect to fatigue, 10 facial cues, and sadness. The stimulus material consisted of 10 individuals (five women) photographed at 14:30 after normal sleep and after 31 h of sleep deprivation following a night with 5 h of sleep.

MEASUREMENTS:
Ratings of fatigue, fatigue-related cues, and sadness in facial photographs.

RESULTS:
The faces of sleep deprived individuals were perceived as having more hanging eyelids, redder eyes, more swollen eyes, darker circles under the eyes, paler skin, more wrinkles/fine lines, and more droopy corners of the mouth (effects ranging from b = +3 ± 1 to b = +15 ± 1 mm on 100-mm visual analog scales, P < 0.01). The ratings of fatigue were related to glazed eyes and to all the cues affected by sleep deprivation (P < 0.01). Ratings of rash/eczema or tense lips were not significantly affected by sleep deprivation, nor associated with judgements of fatigue. In addition, sleep-deprived individuals looked sadder than after normal sleep, and sadness was related to looking fatigued (P < 0.01).

CONCLUSIONS:
The results show that sleep deprivation affects features relating to the eyes, mouth, and skin, and that these features function as cues of sleep loss to other people. Because these facial regions are important in the communication between humans, facial cues of sleep deprivation and fatigue may carry social consequences for the sleep deprived individual in everyday life.