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School-related anxiety, school performance, mental flexibility, emotional eating and frontal alpha EEG asymmetry in girls aged 9-10 with obesity and normal weight

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Asymmetry of spectral power (SP) of frontal EEG α-activity (FAA=(SP(F4)-SP(F3)/(SP(F4)+SP(F3)) is a marker of an individual's emotional background and of his/her reward (RS) and punishment sensitivity (PS) in motivational processes. A positive FAA value (FAA>0) points at greater left-hemispheric frontal cortex activity in relation to the right-brain and speaks of a positive emotional background of the individual, his/her RS and tendency toward goal approach behavior. Greater activity of the right-brain frontal cortex is associated with vulnerability to depression and anxiety and a PS as well as avoidance behavior. Healthy RS subjects have enhanced mental flexibility (MF). On the other hand, it is assumed that FAA points at the motivational orientation of behavior (approach *vs.* withdrawal) irrespectively to associated emotions. To explore interrelationships amongst anthropometric markers of obesity, school anxiety (SA), school performance (SP), MF, emotional eating (EE) and FAA, girls aged 9-10 without psycho-neurological diagnoses were studied: 27 with obesity and 23 with normal weight. The obese girls had lower scours for SP. Positive link between the waist-to-hip ratio and SA was established. No links were found among FAA, SA and BMI. However, a split correlation analysis revealed, that in the lean girls, the BMI is inversely related with FAA (p=0.06) and FAA has a negative correlation with SA and EE. In the obese girls, to the contrary, BMI positive liked to FAA, while FAA had an inverse correlation with FM, which perhaps speaks of RS in obese girls and of their reduced ability to inhibit desirable but risky behavior like over-eating.

Biography

Gaukhar Datkhabayeva has completed her PhD in Human Physiology. She has worked at the Kazakh Academy of Nutrition as a Senior Researcher and has carried out investigations on food and behavioral factors contributing to childhood obesity, as well as the influence of obesity on children's cognitive functions, as part of a program of prevention of pediatric obesity in school-age children in Kazakhstan. Her interests cover popularization of healthy nutrition and elaboration of effective strategies for the promotion of healthy nutrition choices.

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