Monitoring remote of biomedical signals

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The daily physiological signal monitoring is an important tool for assessing the quality of life, control and prevention of diseases. In this research, we developed and validated a remote monitoring system, called FLEEM System, which assists in prevention and health care. The architecture is: a) Patient interface, where the user of the mobile device can enter the daily food intake. Physical activity and heart rate (HR) are acquired by sensors; b) Evaluator interface, in which the health professional can enter patient evaluation data, such as: weight, measures of skinfolds, waist and hip circumference and blood pressure; c) Web platform, in which the professional follows the patient's health status through reports with information that can assist in the planning of health actions. In FLEEM System all data are stored, processed and through signal processing and artificial intelligence techniques the following information about the patient is extracted: history of food intake; daily physical activity (period, duration and intensity); percentage of food components (sodium, fiber, fat, carbohydrates and potassium); heart rate variability (time and frequency domain and nonlinear parameters), demographic index and anthropometric and physiological patterns. 70 participants of both sexes, aged 8 to 12 years, enrolled in public schools in the city of São Paulo, Brazil to validate the system. The App was installed on children's own smartphones for 4 months. It was monitoring eutrophic, overweight and obese children. It was showed differences in the frequency domain and nonlinear parameters. Moreover, within the same group there were also differences between night-, morning- and afternoon/evening-time. Being the biggest variation in the frequency domain parameters during afternoon/evening time for the obese group. The described methodology provides a new inexpensive, reliable and easy to implement approach for remote monitoring and analysis of cardiovascular parameters from children and adults.