Title: Influence of the Sleep Pattern in Patients Submitted to Bariatric Surgery

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Study protocol Participants and ethics

This longitudinal and observational study was performed with patients eligible for bariatric surgery in a private clinic in Uberlandia, Minas Gerais, Brazil, between June 2017 and April 2018. The inclusion criteria were patients in the preoperative period of bariatric surgery aged between 18 and 59 years, body mass index (BMI) ≥ 35 kg/m² associated with two comorbidities or BMI > 40 kg/m² independent of comorbidities, and who would undergo Roux-en-Y gastric bypass or sleeve gastrectomy.

The exclusion criteria were patients who would undergo revisional surgery. The study was approved by the Human Research Ethics Committee (66023717.8.0000.5152), and all volunteers signed an informed consent form. The sample size required was determined using the G*Power software version 3.1.

The sample size calculations were based on f test linear ANOVA, with effect size of 0.15, an alpha level of 0.05, 95% power, repeated measures, within between interactions. Given these specifications, a total sample of 116 patients was required.

Follow-up evaluations

An initial questionnaire including socio-demographic and general information was applied in the preoperative period. Sleep and anthropometric pattern and food consumption were evaluated at the baseline, third and sixth months after surgery. Biochemical parameters were assessed at baseline and in the sixth month.

Sleep patterns and SJL The sleep pattern was determined by applying a questionnaire with questions: "What time do you usually go to sleep during the week?"; "How long (min) do you stay up in bed before sleep onset (after turning off the lights) during the week?"; "What time do you usually wake up during the week?"; "What time do you usually go to sleep on weekends?"; "How long (min) do you stay up in bed before sleep onset (after turning off the lights) on weekends?"; "What time do you usually wake up on weekends?". The bedtime on weekdays and at weekends was obtained whereas the time taken to fall asleep. SJL was calculated by the absolute difference between the mid-sleep time on work-free days and the mid-sleep time on work-days.

Anthropometric variables

The weight, height, waist circumference, hip circumference and neck circumference were measured by standardized methods at all evaluation appointments. The BMI was calculated and classified according to the recommended age ranges for adults (20 years < age < 60 years). Standardized cutoffs were used for waist circumference and neck circumference.

Metabolic profile

Serum levels of fasting glycaemia, fasting insulin, total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL), very low density lipoprotein (VLDL) and triglycerides (TG) were assessed to evaluate the metabolic profile. The blood samples were collected after a 12-h fasting period. All analyses were performed according to validated methodologies.

Dietary Intake Data

The food consumption was evaluated by two 24-h recalls (24HR) at each evaluation moment (baseline, third and sixth month), with one occurring on a weekday (applied in a private room with the interviewer and participant only) and the other one on the weekend (applied by phone, as done in previous studies) . Both 24HRs were conducted by a trained nutritionist using the multiple-pass method. Energy, macronutrients and fiber data were assessed using the software Dietpro Clínico 5.0. Six 24HRs were collected in total, and the mean of the week and weekend 24HRs was used for each of the three evaluation moments.