Introduction. Childhood obesity is a priority in Public Health agenda. The ambulatory care management of obesity is still incipient in Brazil. This work aims to describe an ambulatory model to manage childhood obesity, presenting cooking workshops with children and their relatives as an innovative aspect. Methods. The project was carried out by nutritionists, professors and undergraduate and master students in one health unit of the State University of Rio de Janeiro, Brazil. The model includes the following activities, which were developed during five months: monthly individual nutrition consultation; 10 educative groups with children and their relatives separately to promote healthy diet and physical activity with themes addressed through dialogical and playful dynamics; 10 cooking workshops with children and their relatives to enhance cooking abilities and meal preparation at home and to share practical and healthy recipes appropriated to the children’s food repertoire. Results. 20 overweight/obese children aged 6 to 9 years - recruited from public schools – and their relatives took part in the project. At the end of the experimentation period, a focus group was held with the relatives and an evaluation of the experience was done with the children. Everybody approved the activities, especially the cooking workshop that, according to them, had contributed to changes in family’s dietary habits. Conclusion. The individualized attention articulated with health promotion sessions and cooking workshops contributed to reorganize the dietary routine of obese children and their family. This model can be adapted to other health services.