Nutrición Hospitalaria
ISSN: 0212-1611
info@nutriciónhospitalaria.com
Grupo Aula Médica
España

Lima Guimarães França, Silvana; Sahade, Viviane; Nunes, Mônica; Adan, Luis F.
ADHERENCE TO NUTRITIONAL THERAPY IN OBESE ADOLESCENTS; A REVIEW
Nutrición Hospitalaria, vol. 28, núm. 4, julio-agosto, 2013, pp. 988-998
Grupo Aula Médica
Madrid, España

Nutrición Hospitalaria

Nutr Hosp. 2013;28(4):988-998
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Revisión

Adherence to nutritional therapy in obese adolescents; a review

Silvana Lima Guimarães França[1], Viviane Sahade[2], Mônica Nunes[3] y Luis F. Adan[1]

[1]Department of Pediatrics. Federal University of Bahia. School of Medicine. Brazil. [2]Department of Nutrition Science. Federal University of Bahia. School of Nutrition. Brazil. [3]Public Health Institute. Federal University of Bahía. Brazil.

Abstract

Considering the controversies existent on the subject, the aim of this review is to discuss adherence to diet in obese adolescents. The selection of articles was made in the SCOPUS, COCHRANE, APA Psyc Net, SciELO, LILACS, CAPES Journals, PUBMED/MEDLINE and GOOGLE ACADEMIC databases. Studies published between 2002 and 2012 were selected. There was lack of evidence of conceptual discussion about adherence to diet in obesity in the child-youth context, in addition to scarcity of data on adherence to diet itself in obese adolescents and the methods of evaluating this. Lastly, multiple interdependent factors were found which both facilitated and made the process of adherence to diet difficult for obese youngsters. The majority of these (factors) belong to the socioeconomic and cultural dimension, in addition to pointing out cognitive and psychological factors and those associated with health services and professionals.

(*Nutr Hosp.* 2013;28:988-998)

DOI:10.3305/nh.2013.28.4.6481

Key words: *Adherence. Obesity. Adolescent. Diet.*

LA ADHERENCIA AL TRATAMIENTO NUTRICIONAL EN ADOLESCENTES CON OBESIDAD; UNA REVISIÓN

Resumen

Considerando las actuales controversias sobre el tema, el objetivo de esta revisión es discutir la adhesión a la dieta en adolescentes obesos. Los artículos publicados entre 2002 y 2012 fueron seleccionados en las siguientes basis de datos SCOPUS, COCHRANE, APA Psyc Net, SciELO, LILACS, Revistas CAPES, PubMed/MEDLINE y GOOGLE ACADÉMICO. Observa-se ausencia de discusión conceptual sobre el tema, así como escasez de datos sobre adherencia a la dieta en adolescentes obesos y de métodos de evaluación para aferir esta adherencia. Por último, fueron identificados varios factores ínter-dependientes que facilitan y obstaculizan la adhesión a la dieta en jóvenes obesos. La mayoría de estas dimensiones se refieren a los factores socio-económicos y culturales, además de los cognitivos, psicológicos y aquellos relacionados con los servicios de salud y los profesionales.

(*Nutr Hosp.* 2013;28:988-998)

DOI:10.3305/nh.2013.28.4.6481

Palabras clave: *Cumplimiento. Obesidad. Adolescentes. Dieta.*

Introduction

Obesity is one of today's greatest public health problems.[1] Obesity is characterized by a perverse democratization, for as a global epidemic, it afflicts industrialized and developing countries, high- and low-income populations, men and women, children and adolescents as well as adults.

Childhood and youth obesity has become a public health concern due to the drastic increase in their prevalence rates[2-9] and for presenting a variety of physical and psychosocial comorbidities.[10] Moreover, when predicting its continuation in the adult stage,[11] the early morbi-mortality during this period increases,[12] thus reducing life expectancy.[10]

Brennan et al.[10] emphasize two recent revisions (Oude Luttikhuis H et al., 2008 & Tsiros et al., 2008) about treating excess weight and obesity in children and youth, which concluded that combining behavioral, dietary and physical activity interventions can produce clinically significant reductions in excess weight for this population.

Diet plays a key role in success rates of treating obesity, but until now, empirical evidence is limited. Some authors highlight the necessity of producing high-quality studies following the dietary approach to verify, among other things, details of prescription for dietary therapy and adherence rates to such treatment.[13]

In adherence to diet, it is necessary to recognize the preponderant role of eating behavior in the prevention and treatment of obesity.[14] There are nutritional, demographic, socio-cultural, environmental and psychological

Correspondence: Silvana Lima Guimarães França.
Department of Pediatrics.
Federal University of Bahia. School of Medicine.
40100020 Salvador-Bahia. Brazil.
E-mail: sillgf@hotmail.com

Recibido: 7-II-2013.
Aceptado: 13-VI-2013.

factors,[15] whether associated or not, which will at some level, either make adherence to healthy eating practices easier or more difficult, predisposing to obesity, or aggravating it once it has been established.[16,17,18]

Despite the high prevalence of and biopsychosocial consequences of excess weight on adolescents,[1] understanding the phenomenon of adherence to therapy is controversial,[19] for treatment options are scarce,[10] and there are few studies that explore or evaluate such treatments, or that approach adherence to guidance, particularly among adolescents.[10,13,20-22] Furthermore, there are studies that demonstrate gaps in the medical records in terms of recommendations for behavioral changes even among obese children.[23]

The ability to make comparisons between obesity intervention programs and their results is limited[3], especially due to methodological deficiencies. In a systematic review of the literature, Collins et al.,[13] encountered deficiencies in the quality of dietary evaluation in the majority of studies analyzed. Rarely did they describe objectives of dietary interventions, thus compromising the quality of the majority of studies, in terms of evaluation of alterations in food intake in response to interventions. Therefore, there is a need for studies that make in-depth assessments of the efficacy and safety of treatments of child and youth obesity.[24]

Considering the gaps and controversies presented above, this review, discusses adherence to nutritional therapy among obese adolescents, its conceptual aspects, evaluation criteria, and limiting and facilitating factors, in search of guiding elements for educational strategies targeting this population.

Methodology

A non-systematic review of the literature was conducted using research based on the **S**COPUS, COCHRANE, APA Psyc Net, SciELO, LILACS, CAPES Journals, PUBMED/MEDLINE and GOOGLE ACADEMIC databases, using the descriptors *adherence/non-adherence to diet of obese adolescents, barriers to obese adolescents' adherence to diet, conceptual discussion of adherence to diet*, and equivalent search terms in other languages.

Criteria for selecting studies included articles, books and documents that explored the theme of obese adolescents' adherence to nutritional therapy, published in Portuguese, English, Spanish and French between 2002 and 2012. Article references were also analyzed to find studies not found using the search engine.

Despite the vast literature on adherence to therapeutic diets for treating pathologies such as HIV/AIDS, diabetes, hypertension, and heart disease,[25-31] as well as on nutritional therapy for weight loss or metabolic control;[32-37] consultation of the references on the issue of adherence of obese adolescents to nutritional therapy confirmed reduced frequency of publications about this issue.

Articles chosen for analysis that met the objectives of this review totaled 42 publications, including 27 national and 15 international journals, distributed as follows: 10 arising from quantitative scientific research, 11 from qualitative research, nine literature reviews, nine theoretical articles, two documents and one book.

Of the selected works, six were from the field of medicine, four from psychology, four from nursing, five from nutrition, one from physical education, one from pharmaceutics, and another from health education. In addition to these, 11 were interdisciplinary articles combining nutrition and other health fields, such as: medicine, physical education, nursing, dentistry and psychology. One study was chosen from the fields of education and psychology, another from education/technology/health and a third from nursing, psychology and medicine. Two studies were selected from the fields of medicine and psychology and another from medicine and public health. One document came from the Brazilian Ministry of Health[38] and another from the Brazilian Institute of Geography and Statistics.[4] Finally, the book is an American publication whose authors come from the fields of communication and patient education.[39]

After a systematic reading of the studies, some aspects were outstanding for deepening of analysis and discussion: concepts of adherence to diet, evaluation measures factors facilitating and limiting adherence to diet among obese adolescents. These factors were grouped into 3 dimensions: socioeconomic and cultural; that related to the patient, comprising psychological, emotional and cognitive elements; and lastly, the dimension related to health services and professionals. This grouping was inspired by the classification made by World Health Organization (WHO, 2003) presented by Dias et al.[24]

Results and discussion

Concepts of diet adherence

Despite the vast literature on adherence to health treatments,[25,26,40-42] there are far fewer publications on "adherence to diet".

Among selected articles there was no conceptual discussion of Child-Youth "adherence to diet". One observes factors related to adherence,[2,3,14,15,18,20,24,43-55] criteria or evaluation measures[3,20,55] without reference to the conception of adherence used; and strategies for confronting the situation, representing elements facilitating this process[4,10,15,22,24,46,52-54,56].

Conceptual aspects of adherence were identified in articles, which in a generalist manner, approached treatments for chronically ill people[57,58] or specifically medication therapy, whether it was broad in scope,[19,59] related to chronic non transmittable diseases,[24] or focused on arterial hypertension[60] and HIVAIDS[38].

Adherence was also discussed conceptually in articles about cardiopathies in general,[40] diabetes mellitus[26] and in the sphere of collective health.[61]

Although many use the term "adherence to treatment" (or to therapy or therapeutic regime) with reference to adherence to medication[59,60] or diet,[20] it is worth pointing out that adherence to a dietary-therapeutic proposal is one of the strategies in the treatment of obesity, in addition to physical activity, Behavioral and Cognitive Therapy, medications and changes in lifestyle. Therefore, the term "adherence" refers to various practices, practices inherent to health, of a multifactorial nature, which transcend simply following a prescription. These include factors such as: socioeconomics and culture, the healthcare system and its professionals, base illness and comorbidities, treatment, and the sick person.[24]

Although the first consideration on the importance of following medical prescriptions dates back 2,400 years to Hippocrates[24], no recent articles focused on the theoretical-conceptual discussion about adherence to diet. Only one book[39] and one review article[62] were found, published over 25 and ten years ago, respectively. Thus, the generalist concept of "adherence", which appeared at the end of the 1950s, was rescued.

The concept of "adherence" varies a great deal,[19,38] but generally speaking, the definition of the WHO (2003) is adopted, which merges Haynes (1979) and Rand's (1993) definitions.[60] Thus, from a biomedical perspective, the adherence process occurs when a person's behavior in ingesting medication, in complying with a diet and/or lifestyle changes coincide with the recommendations of a health care provider.[24] Furthermore, Leite & Vasconcelos[19] affirmed that adherence occurs when 80% of recommendations/ prescriptions are followed.

An important distinction is made between the adhesion terminologies *(adherence)* and agreement or *compliance* (inclination to please).

Compliance, the term developed by Haynes (1979), concerns the patient's capacity to follow the medical prescription.[24] It suggests that the patient is a passive follower of the health professional's "orders", and that the therapeutic plan is not based on an alliance between the two.[60] Whereas *adherence* allows the patient's cooperation in the choice of his/her treatment, and there is thus a better relationship between the health professional and the patient[24].

This distinction was adapted to the context of food and nutrition by Holli & Calabrese.[39] They defined *"compliance"* as the extension to which individual food behaviors coincide with dietary recommendations of the nutritionist, whereas *"adherence"* suggests the subject's voluntary participation in problem solving and deciding about dietary changes (table I).

From this perspective, that which is denominated *adherence*, in the majority of published studies, refers to *compliance*, because in reality health care has traditionally always been influenced by the biomedical model,[63] characterized by the verticalized and hierarchical relationship between health professionals and patients.

The term *compliance* appears be better adapted to the scientific rationalization of modern medicine, sustained by an objective and quantitative measurement that ignores the health-disease relationship.[64]

From this perspective, one supposes no interference from family members, friends or neighbors, or from family members, friends or neighbors, and less so from their representations of body, health and disease[26]. Therefore, it is suggested that the therapeutic scheme prescribed was not a shared decision between patient and health professional.[38, 57]

On the other hand, the concept of adherence goes beyond simply carrying out the determinations of the health professional.[26,40] Among other things, it depends on the patient's ability to deal with biological, behavioral and social factors that influence health and disease, and which equally involve all health professionals.[40]

In the process of adherence, patients' autonomy and ability to accept guidance is highlighted.[26] Should they not accept, the professional has no responsibility for

Table I
Principal distinctions between the terms compliance and adherence in the nutritional context

Concepts	*Definition*	*Principal objective*	*Characteristics of nutritionist*	*Patient characteristic*
Compliance	Eating behaviors of individuals coincide with nutritionist's dietary recommendations[39]	Convincin and persuading the patient to follow therapeutic dietary guidance	Emphasis in the therapeutic diet prescription, overestimating the recommended nutritional guidance	Passive, obedient and submissive to what the nutritionist determines
Adherence	Voluntary participation of the subject in solving their own problems and making decisions about changes in their diet[39]	Estable the patient to understand their eating habits and develop a critical, autonomous and responsible attitude to feel capable of voluntarily making short- and long-term conscious decisions	Emphasis on the construction of trusting relationships, active listening and shared decision-making with the patient	Active, questioning and autonomous, in which decisions are made together with the nutritionist

the consequences of the decision taken.[57] This attitude may be interpreted as deviant behavior or incompetence on the part of the *non adherent* patient to follow the instructions.[24]

Thus, the multidimensional nature of adherence with regard to construct is recognized[65], considering the biopsychosocial approach to it over the last few years.[59] Nevertheless, a hiatus prevails between recognizing the complexity of the subject within scientific discussion and its concrete action in the majority of clinical-educational practices.

As far as the relationship between health professional and patient is concerned, there appears to be a type of responsibility transfer game in non adherence: the health professional holds the patient responsible, and when the patient is a child or adolescent, the parents hold the health professional responsible. These dynamics impose the need for reconsidering conceptual aspects of this process within the scope of food and nutrition: what does adherence to a certain diet really mean? It appears to be only one aspect of eating behavior, which is overvalued to the detriment of other psychosocial cultural factors.

One could conclude that advancement in the conception of adherence to diet is also considering some elements of the adherence concept proposed by the Vulnerability, Adherence and Collective Health Needs group[61]. Its authors emphasize three plans of approach: the first is with respect to the way in which the user understands the health-disease process. The more restricted the individual's understanding, the more passive he/she will be when confronted with dietary challenges. However, should his/her understanding be broad and emancipatory, the more active he/she will become, improving his/her abilities to face the illness.

The second approach refers to the subject's social position, including access to work, housing, health services, food, clothing, education, information, transport and leisure. It also includes concepts of freedom, autonomy, creativity, shared and constructive relationships, affection and happiness; in effect, elements that will determine access to a dignified existence and the potential for confronting processes that lead to exhaustion.[61]

The third approach relates to the complex process of producing health, involving the societal network with its contradictions and constitutive tensions. In this context, the most fundamental relational skills are those that favor apprehending health needs by practicing listening, building ties, establishing symmetrical relationships and empowering the patient to construct and choose the therapeutic project.

In this sense, when Minayo[66] affirmed Anthropology'scollaboration with Medicine, Public Health and Epidemiology, the value of knowledge that arises from the patients experience is also affirmed, emphasizing the need to problematize the role of diagnostic and treatment techniques in the face of objective and subjective reasons of the social actors involved in production and reproduction of care.

In view of the foregoing, one is urged to think about the problem of diet adherence in obese adolescents, using interpretive and comprehensive approaches to illness, its causal factors and psychosocial repercussions, focusing on the family context and dynamics, the relationship with food and nutrition, and the influence of the media and social groups, whichin turn must be understood at the individual, meso and macro contexts.[19]

Measures of its evaluation

Despite recognizing the complex diet adherence process as a phenomenon involving psychosocial cultural aspects, its evaluation measures continue to reflect a hiatus between problem scope and over-valuation of measurable aspects. Studies evaluating the phenomenon have adopted an instrumental conception of following a diet, focusing on the disease and not the sick person, with his/her reality, characteristics, representations of the disease and institutional relationships.[58]

In the absence of a standard measure, or subjective appreciation of individual behavior,[67] when adherence is evaluated within the scope of food and nutrition, privileged aspects continue to be: adolescents and their parents appearing at consultations; follow-up or drop-out rates of weight reduction programs, measured by structured questionnaires about food and nutrition and frequency of eating; percentages of weight loss by means of anthropometry; and lastly, clinical and laboratory data.[3,19,20,55]

Around 20 to 50% of the patients did not schedule appointments.[59] Considering cases demanding habit changes, such as quitting smoking or reducing food intake, rates are even higher. Around 30 to 50% of patients, irrespective of pathology, therapy and prognosis, do not adhere to treatment.[24]

Social inequalities as regards access to health care intensify non adherence, making it a problem in some realities.[24] In developed countries, the rate of adherence to treatments represents around 50% of the total; in developing countries, this percentage diminishes significantly.[67]

In terms of treating obesity, it has been found that the majority of obese persons do not remain in dietary programs. Among those that remain, the majority do not lose weight; of those who do, the majority return to their previous weight.[68]

Low adherence to nutritional treatment has been observed in patients submitted to both short- and long-term interventions.[35]

Studies exploring adherence to nutritional therapy of obese adolescents are lacking,[4,17,45] and no consensus exists about the efficacy of intervention programs.[41] There are also few studies about improvement in nutritional education strategies for obese adolescents.[53]

Vieira et al.[20] emphasized the role of adherence to treatment by adolescents and their families, resulting in 30 to 80% of immediate therapeutic failure.

Low adherence from the beginning of treatment may help to explain another problem: the difficulty in maintaining weight after initial reduction. Fewer than 5% of adolescents that lost weight were able to maintain it after five years.[20] Around 50% of patients do not return to continue treatment.[55]

Tershakovec & Kuppler[55] presented studies about the adherence and drop-out rates in children and adolescents: in of these studies about a nutritional education program for children with hypercholesterolemia, identified a 13% drop-out rate over the course of 12 months. In another, 86% of obese children completed two years of follow-up, whereas of the 97% attended, half or more participated in the group therapy sessions.

In reviewing intervention studies, Denzer et al.[3] observed heterogeneous data about the efficacy of short and long term weight reduction programs for children and adolescents and limited comparability for methodological reasons. Positive results have almost always been observed in integrated behavioral intervention programs that demand strong commitment by patients and parents for long-term intensive treatment.

Vieira et al.'s study,[20] whose objective was to evaluate the initial adherence of 75 obese adolescents to a weight reduction program, defined "adherence" according to a scale based on the number of nutritional instructions followed: from 8 to 9 (good); from 5 to 7 (regular) and 4 or fewer (poor). They concluded that only 29.3% had "good adherence" and that no patient was able to follow all nine instructions, despite the weight reduction in a group of adolescents.

In another study,[3] the mean number of visits and drop-out rates measured the adherence of over 200 children and adolescents to outpatient treatment for obesity. The regression model created to identify possible predictors of adherence/observance identified, on average, a 30% drop-out rate for each scheduled visit.

Leite & Vasconcelos[19] emphasized the importance of considering adherence/non-adherence based on therapeutic system chosen, since there are motivations and blockages present at all levels of treatment, influencing the patient's relationship with his/her health and therapeutic plan.

Regarding food and nutrition, the process of adherence to diet seems to precede the choice of therapeutic system, as it reflects innumerable factors related to the history and development of the food culture of the adolescent, his/her family and social group.

Therefore, it is recognized that to assist the chronically ill person, requires one to consider the plurality of the care and self-care.[25] However, the use of exclusively quantitative data to analyze adherence to diet does not express the complexity of the factors conditioning food choices and practices.

From this aspect, to evaluate adherence or try to understand its dynamics requires amplification both of the concept of adherence to diet and the intervention strategies that may reflect on the evaluation instruments and techniques, because it is not simply a question of following or not following instructions, and even less so of adhering the a proposed menu.

The menu may be understood as a mere abstraction that may or may not be realized by the patient, as a result of a set of practices as regards fractioning, time intervals, quantity and preparation of food, in addition to concepts, demands, needs, knowledge, beliefs, values and expectations that the patient has about food and nutrition.

Thus, Reiners et al.[57] signaled that the nature, senses and determinants of non-adherent behavior are complex, and one must therefore consider this issue from the patient's perspective.

Facilitating and limiting factors of diet adherence in overweight-obese adolescents

Socio-economic factors

There are innumerable interconnected factors that make the process of adherence to a healthy diet difficult or easy for obese adolescents. Many factors constitute the very determinants of food behavior in adolescents.[49]

Multiple interdependent factors were identified, which may positively or negatively influence the search of obese youths for a healthy diet. The largest portion is related to the socioeconomic and cultural dimension, including family, media, urban environment, peer group, school, religion, money and time.

Family and/or parents, a fundamental element, may act as a limiting or facilitating factor. If the treatment begins before the family is ready to support it, a successful outcome becomes improbable[2]. In this context, there are various manners for the family to act, which may make it difficult to follow a diet:

1. The family does not adhere, or is not very involved in the diet therapy process.[20, 44, 46, 53]
2. The parents/or persons responsible for the patient consultations.[45]
3. The parents insist on, or restrict the consumption of certain foods.[45] Indeed, studies have demonstrated that the more mothers restrict their childrens' food access and quantity consumption, the more challenged in self-regulating their intake they will be. Thus, inadequate demands on youngsters, or food restrictions imposed by parents may promote the children's appetite for caloric foods[24], perhaps to rebel and assert their independence from parental control[49]
4. Inadequate food choices in the family diet[48], reinforcing consumption of foods recognized as "unhealthy".[49]
5. Absence of familial dialogue about food leads to emotional difficulties and prevents problematization[53].

6. The family lays responsibility for food behavior changes exclusively on obese youngsters, or it participates in an authoritarian, critical and accusing manner without aggregating other causal elements of obesity, reinforcing inadequate food consumption and/or causing anxiety in the adolescent.[24, 53]

The majority of behaviors integrated with the process of hunger/satiety, including the selection and ingestion of preferred foods, are probably learned and influenced by elements such as maturation and constitutional aspects, socialization agents (especially televised publicity), affective factors and the mother-child-family interaction.[52]

Andrade[14] emphasizes the role of parents as food behavior models for children, and the contribution of this model in the treatment of obesity. Therefore, parental eating patterns must be managed together with those of obese children and adolescents, otherwise the treatment will fail.[43] Nevertheless, the family often denies their share of responsibility for the change in the child's eating habits.[47]

While family and/or parents' action as a facilitating element in the process of adherence is important[24, 54], nature of this role and the limitations of this participation are unclear.

The Media is another important factor that acts more as a limiting than facilitating factor in determining youngsters' adherence to healthy eating. The media, recognized as one of the determinant psychosocial factors of exogenous obesity[20] is considered by a certain group of adolescents in Costa Rica, as a barrier to following a healthy diet[48]. In fact, in the globalized society, economic growth depends on the constant creation of new products, emphasizing consumption and its immediate pleasures, in addition to the massification and standardization of trends.[24] This, in practice, is represented by the large production and marketing of industrialized food products, generally rich in simple sugars saturated fatty acids and sodium.

Another aspect expressed by adolescents is the practicality of not very healthy foods,[50] a quality generally emphasized by *marketing*, and may be associated with other limiting factors, such as limited of time to prepare and consume healthy food [48] and the excess of obligations.[24, 50]

Parizzi et al.[24] pointed out incentive, by means of aggressive actions of the means of communication, for the exaggerated consumption of these ready-made industrialized foods, high in calories, poor in fibers, with low satiating power; and they also draw attention to the fact that the food industries, supported by the media, are defining both the quantity and quality of the food consumed. Moreover, they point out that 53% of the advertisements transmitted during the time destined for children's programs on television, are related to industrialized children's foods.

In a qualitative study Stevenson et al.[49] identified social pressures as a barrier to healthy eating behavior in adolescents because on the one hand, there is a demand highly caloric foods, while on the other, there is the discourse against obesity, imposing a slender body as the standard of beauty.[18] In this ambivalent context, the media plays an important role in stimulating the consumption of calorie dense foods in their advertisements with thin, agile and dynamic individuals, distant from the universe of obesity.

This review identified no studies that emphasized the positive role of the media with regard to following healthy eating, which represents a challenge to the scientific community, considering the sociopolitical and economic questions interlocked in the media universe of the food industries.

In addition, the lack of a safe urban environment can be considered in the socioeconomic and cultural dimension. Disorderly urban expansion, lack of safe spaces for pedestrians and leisure areas profoundly compromise the quality of people's lives.[24] This context facilitates sedentarism, already aggravated by technologies such as elevators, cars, TV, computers and the Internet[20]. Other studies show the relationship between obesity in children and adolescents and excessive time spent at the television and/or computer while consuming high-calorie snacks.[20]

Given this, one must consider and seek to combat the principal reasons for childhood sedentarism, which depends, to great extent, on the social environment. Furthermore, it seems easier to confront this aspect at the individual level, investigating personal and familial reasons.[69]

Paradoxically, while recognizing the **school's** duty as a formative agent of healthy habits,[47] in some researches with adolescents, it was pointed out as a barrier to healthy eating behavior. These youngsters discuss the unavailability of healthy foods in the school environment [48] and others affirmed that in this environment, the appetite is much greater, and in the intervals they may eat foods that are not healthy.[50] Moreover, the manner in which the school approaches calorie dense foods may, in a certain way, work to reinforce the adolescents' disposition to prefer them.[49]

Religion is also pointed out in a contradictory manner; that is to say, it influences the adolescent, either by freeing him/her of commitment to change and confront dietary problems, or causing him/her to temporarily abstain from certain foods, motivated by religious customs.[53]

Finally, ambivalence is present in the availability of money and time, since adolescents pointed out lack or excess of both as barriers to adopting healthy eating habits[50].

Patients-related factors

Other factors more directly related to the obese adolescent identified were: no commitment to dietary agreements; going on diets before treatment; lack of

motivation; depression; low self-esteem; peer pressure; flavor of foods considered healthy; greed; unhealthy preferences and food impulses to control emotional states.[48,50,51]

To Mello et al.[45] no commitment to agreements by children and adolescents results from understanding the therapeutic proposal as something "magic" and favors (as from the second meeting) not showing up for consultations. Low adherence to weight management proposals (eating habits and physical activity) was observed, as 50% of the children and adolescents in their sample had previously gone on diets to lose weight. Bautista-Castano et al.'s study[68] also points outgoing on diets before treatment for excess weight and obesity as a predictive factor for low adherence.

Adding to the factors previously presented, whether as cause or consequence of these, patients' lack of motivation is one of the most frequent barriers mentioned by health professionals in treating obese children and adults.[44]

Daniels et al.[2] also pointed out the relationship between depression and obesity in children and adolescents. In a study with obese adolescents, Serrano et al.[18] concluded that reduced self-esteem, due to a different body image, expressed by feelings of guilt and self-contempt, in most instances leads to social isolation. On the other hand, Rodrigues & Boog[53] pointed out that low self-esteem may arise due to social exclusion, originating both from the social group and the family. From this perspective, Rossi et al.[51] emphasized that one advantage of a healthy diet is the psychological benefit of increased self-esteem.

Therefore, in terms of psychological factors, emotions are reported by adolescents to be barriers to consuming certain healthy foods. In Stevensona et al.'s study,[49] interviewees' comments about mood were generally associated with the ingestion of foods considered unhealthy, such as chocolate. Its consumption was mentioned because it boosted mood when youngsters felt upset, depressed or bored. With this demographic, the central motivation for food choice is more frequently determined by physical (food aesthetics in terms of flavor, texture, appearance and smell) and psychological factors, inherent to the individual.

Health system - related factors

Finally, evidence of factors related to the dimension of health services and professionals was shown to interfere in the therapeutic process by: social actors'-conception of healthy eating, professionals' pedagogic approach and the structure and functioning of health services themselves.

The youngsters mentioned healthy eating for weight control as a quick fix, instead of a long-term health strategy. Along this line of reasoning, possible consequences of obesity were linked to pathological obesity, and not unhealthy eating behavior.[49]

Another limiting concept is dichotomous thinking about eating practices, separating eating correctly, associated with "good" foods (fruits, vegetables, rice, beans and meat), from eating incorrectly, associated with "bad" foods (sweets, fast food, French fries, savory snacks, mayonnaise and sodas), which inhibits dietary balance among adolescents and their family members.[49,53]

This dichotomy originates from the culture and previous experiences of youngsters with healthcare services, and is reinforced by health professionals' authority, who know no better than to approach eating by reproducing practices transmitted to them; that is to say, adopting simplistic, hardly practical instructions, valuing the exclusion of many foods.[53]

This practice reflects another limiting factor, the pedagogical approach favored in the clinical educational practice of most health professionals. As they have an educational background/training incompatible with problematizing educational practices, they value the adolescent's "obedience" to dietary instructions, rather than stimulating their autonomy when faced with decision making about daily food choices.[53] Professionals then implement traditional nutritional interventions with the goal of providing basic information about healthy eating concepts.[50]

When one expects strict obedience from the patient to follow nutritional instructions, one is restricted to integrating rational knowledge with the subject's complex reality, thus reinforcing the myth that obesity is resolved simply by drawing up a diet[70]. By disregarding the singularity of the patient and his/her triggering factors, the ideological, symbolic and emotional reasons inherent to his/her eating practices may negatively impact the obese youngster's motivation to undergo treatment.[24]

In view of this, one deduces the precarious nature of the tie between the patient and professional in this educational approach, making it unfeasible to adopt healthy behavior.[53]

It is important to add elements limiting adherence to healthy eating to the structure and functioning of many health services. Story et al.[44] identified the lack of support services, reimbursement and clinical time as the obstacles most mentioned by professionals in managing obese children and adolescents. Another study[55] also associated the type of insurance/reimbursement with children and adolescents dropping out of a weight control program. Rodrigues & Boog[53] pointed out that health services hardly ever approached food's symbolic aspects, removing any meaning the individual attributes to foods. Moreover, many health professionals struggle with behavioral management, guidance strategies, parenting skills and management of family conficts.[44]

Given these difficulties, it's fundamental to consider the potential of cognitive-behavioral therapy (CBT) as an important strategy to maintain long-term behavioral changes and weight loss, helping the adolescent and his

Table II
Limiting and facilitating factors of the diet adherence process of obese adolescents according to reviewed articles

Dimensions	*Limiting factors*	*Facilitating factors*
Socio-economic factors[3,18,20,24,44-50,53,54,70]	• Family and/or parents • Media • Lack of safe urban environment • School • Religion • Money • Time	• Family and/or parents • Urban planning • School • Religion • Money • Time
Patients- related factors[2,18,44,45,48-51,53,68]	• Not committing to dietary combinations • Missing appointments • Dieting previous to treatment • Lack of motivation • Depression • Peer pressure • Flavor of foods considered healthy • Gluttony • Unhealthy food preferences and impulses to regulate emotional states	• Search for new friendships • Adolescent's own disconfort with their physical state • Behavioural techniques using interdisciplinary approaches
Health system - related factors[3,10,24,44,49,50,53-56,61,70,71]	• Dichomotous conception of food • Pedagogical approach utilized by professionals • Lack of support and reimbursement services • Lack of clinical time • Lack of approach to symbolic aspects inherent to food • Difficulties of health professionals in behavioral management, mentoring strategies, parenting skills and family conflict mediation	• Behavioural and cognitive therapy • Motivational interviews • Group treatment for obese youth • Change in conception of healthy eating through a problematizing approach • Joint formulation of nutritional objectives between the obese adolescent and others involved

or her family to manage boundaries and make these changes possible. This strategy is coherent with adequate approaches utilizing behavioral modification and family support to promote dietary changes, increase physical activity and reduce sedentary behaviors of overweight and obese adolescents.[10]

From the perspective of pointing out facilitating elements of behavioral modification, specifically seeking adherence to a healthy diet, the review article by Resnicow et al.[56] highlights that despite the evidence for Motivational Interviews as a means of prevent and treat childhood obesity, this technique is only beginning to emerge. This methodological instrument, which focuses on reflexive listening and shared decision-making, appears to be especially effective for individuals that are at first less "ready" for change; and thus may be feasible with obese children and adolescents struggling with diet adherence.

To finalize, it is fundamental to point out that the same elements that make it difficult to adhere to a healthy diet may act as facilitators of this same process (table II).

The support of the entire family, especially of the parents adhering to the same diet, are motivators for adopting healthy eating habits.[3,48,54] The role of parents as examples of food behavior appears to cause the most positive results, above all considering that today, the family configures as the manager of social risks that permeate obesity.[70]

The search for new friendships, the adolescents' discomfort with his/her physical state, in addition to adequate nutritional interventions, may improve adherence to a healthy diet.[54] In fact, behavioral techniques using an interdisciplinary approach achieve more significant results in weight loss; above all, when the treatment is long-term and includes continued follow-up.[54, 71]

Vieira et al.[20] emphasized attention to discipline (fractioning, quantities, times, place reserved for eating without TV and without reading) as a facilitator incontrolling eating behavior. From this perspective, Serrano et al.[18] observed an awareness in youngsters with regard to the regular physical activity, reducing time spent in front of the TV, videogames, computer, and Internet, thus corroborating control of consuming fast, calorie dense snacks.

The school may be a partner in adherence, because there children eat at least one meal, which makes it possible to engage in food and nutritional education.[47]

The search for healthy eating requires actions not only with an informative and educational slant, but also control of unhealthy food advertising, destined especially for a child audience(legislative measures), tax exemption for healthy foods, and increased taxation on unhealthy foods (taxation measures) and others related to urban planning, favoring the practice of physical and leisure activities.[46,47]

Regarding health services and actions of health professionals, some studies revealed positive aspects in

the group care of obese youngsters,[3,53,61] making them reflect by exchanging experiences about food habits. This group movement facilitates discussion of transversal themes that may be absent in individual consultations[53]. However, better results in dietary counseling were only founding groups not exceeding 15 children.[3]

Another fundamental factor is changing conceptions of healthy food by social actors. In this sense, discussion of "ethical conduct", according to Espinosa's philosophy, proposed by Carvalho & Martins[70] may serve as a reference for promising transformations. For the authors, an ethical conduct considers the singularities and participation of those involved in changing eating behavior, opening space for life's unpredictability and acknowledging the tension caused by the pleasure of eating, on one hand, and following nutritional recommendations, on the other.

It is, therefore, conceiving another form of knowledge associating reason with the adolescent's experience, establishing an ethical relationship between food, body and health, making nutritional rules flexible to fit the needs of singular corporeity, experiences, and youngsters' internal conflicts.

From this perspective, the problematizing pedagogical approach[53] makes adolescents perceive the existence of only two ways of feeding themselves, and through natural curiosity and ties with the professional, they begin to problematize day to day questions, seeking to develop their own strategies for confronting situations. This educational practice is understood as a space in construction, in which changes occur according to each person's desire, time and limits.[61]

Through this approach, positive changes were observed in the dietary practices of adolescents (more frequently in the group attended individually) and in the subjective aspects of food behavior (more frequently in collective attendance). Moreover, adolescents expressed bodily feelings related to dietary practices, manifested their food preferences more spontaneously to the family, and equally, changes were observed in psychological aspects such as self-esteem and social interaction.[53]

Therefore, thinking of nutritional therapy within the scope of obesity in adolescents is perhaps not essentially being concerned with the issue of adherence to diet, which becomes a natural consequence of a therapeutic path run "on many legs".

Moreover, Carvalho & Martins[70] suggested the joint elaboration of nutritional objectives among obese adolescents and others involved (parents or guardians), because a dietary plan imposed exclusively by a scientific logic impedes peoples' freedom, leading them, albeit unconsciously, to reject the diet that is presented to them.

Conclusion

This review showed evidence of the lack of conceptual discussion, over the last 10 years, of adherence to diet in studies on childhood obesity. Despite the scope of adherence to treatment, this term is used in scientific studies as a synonym of adherence to diet, which denotes its limited application. The non-existence is a concept of adherence to diet, with the particularities that the complexity of food behavior requires. Effectively, there is an adaptation of the generalist concept of adherence, guiding the definition of adherence to nutritional therapy, making it a concept that is still under construction.

While the term *adherence* is widely used, what one observes in the health professional-patient relationship, frequently is *compliance*, reflecting a hierarchical relationship, part of the biomedical model in action. In light of this, in order to advance in the conceptualization of adherence to diet, it is necessary to go beyond the purely dietary and normative aspects, and go in the direction towards understanding the manner in which the obese youth understands his/her own health-disease process, focusing on his/her relationship with food and family dynamics, in addition to influence of the media and social groups.

There is little data on adherence rates to diet in obese adolescents and about their measurements and evaluation; in addition to the lack of consensus about intervention programs for this disease.

Multiple interdependent factors were identified which both facilitated and made the process of adherence to diet difficult for obese youngsters. The majority of these factors belong to the socioeconomic and cultural dimension, in addition to cognitive and psychological factors and those associated with health services and professionals. Therefore, studies that evaluate the adherence to nutritional interventions in treating child-youth obesity are necessary, considering the particularities and contextualization of these factors.

Acknowledgements

The authors thank the Coordination of Improvement of Higher Education Personnel - CAPES for granting the PhD scholarship and support necessary for Silvana Lima Guimarães França.

References

1. Castelnuovo G, Manzoni G, Villa V, Cesa G, Pietrabissa G, Molinari E. The STRATOB study: Design of a randomized controlled clinical trial of Cognitive Behavioral Therapy and Brief Strategic Therapy with telecare in patients with obesity and binge-eating disorder referred to residential nutritional rehabilitation. *Trials* [serial on the internet] DOI: 10.1186/1745-6215-12-114. 2011; 12:114 [cited 2011 Dec 12]; Available from: http://www.trialsjournal.com/content/12/1/114.
2. Daniels SR, Arnett DK, Eckel RH, Gidding SS, Hayman LL, Kumanyika S, Robinson TN, Scott BJ, Jeor S St, Williams CL. Overweight in Children and Adolescents: Pathophysiology, Consequences, Prevention, and Treatment. *Circulation* 2005; 111 (15): 1999-2012.

3. Denzer C, Reithofer E, Wabitsch M, Widhalm K. The outcome of childhood obesity management depends highly upon patient compliance. *Eur J Pediatr* 2004; 163 (2): 99-104.
4. Brennan L, Walkley J, Fraser SF, Greenway K, Wilks R. Motivational interviewing and cognitive behavior-therapy in the treatment of adolescent overweight and obesity: study design and methodology. *Contemp Clin Trials* 2008; 29 (3): 359-75.
5. Instituto Brasileiro de Geografia e Estatística. POF 2008-2009: desnutrição cai e peso das crianças brasileiras ultrapassa padrão internacional. IBGE 2010 [cited 2011 Dec 12]; Available from: http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=1699&id_pagina=1.
6. Charles MA. Épidémiologie de l'obésité infantile en France et dans le monde. *Obesité* 2006; (1): 58-61.
7. Peréz-Morales ME, Bacardí-Gascón M, Jiménez-Cruz A. Chidwood overweight and obesity prevention interventions among hispanic children in the United States; systematic review. *Nutr Hosp* 2012; 27 (5): 1415-21.
8. Gallardo P L, Bayona I, Mingo T, Rubiales C. Utilidad de los programas de educación nutricional para prevenir La obesidad infantil a través de un estudio piloto em Soria. *Nutr Hosp* 2011; 26 (5): 1161-7.
9. Aspigalla CH, Cruzat CM, Torres MA, Haemmerli CD, Pérez CV, García AT, Díaz MB, Vidal CG, Llona VS, Gana CR. Subjective experiences of adolescents with obesity regarding to their treatement. *Rev Chil Nutr* 2012; 39 (2): 191-9.
10. Brennan L, Walkley J, Wilks R, Fraser SF, Greenway K. Physiological and behavioural outcomes of a randomised controlled trial of a cognitive behavioural lifestyle intervention for overweight and obese adolescents. *Obesity Research & Clinical Practice* 2011; (7): 23- 41.
11. Fisberg M. Primeiras palavras: uma introdução ao problema do peso excessivo *in*: Atualização em obesidade na infância e adolescência. São Paulo. Ed Atheneu, 2004.
12. Farias JM. Orientação para prevenção e controle da obesidade infantil: um estudo de caso. Dissertação de mestrado. Universidade federal de Santa Catarina, UFSC. Florianópolis. 2005.
13. Collins CE, Warren JM, Neve M, McCoy P, Stokes B. Systematic review of interventions in the management of overweight and obese children which include a dietary component. *Int J Evid Based Healthc* 2007; 5 (1): 2-53.
14. Guedes MDGPR. O desenvolvimento das escolhas alimentares em crianças e adolescentes. *Iber psicologia* [serial on the internet] ISSN: -e 1579-4113. 2005; 10 (2) [cited 2011 Dec 12]; Available from: http://www.fedap.es/IberPsicologia/iberpsi10/congreso_lisboa/andrade/andrade.htm.
15. Toral N, Slater B, Cintra IP, Fisberg M. Comportamento alimentar de adolescentes em relação ao consumo de frutas e verduras. *Rev Nutr* 2006; 19 (3): 331-40.
16. Silva GAP, Balaban G, Motta MEFA. Prevalência de sobrepeso e obesidade em crianças e adolescentes de diferentes condições socioeconômicas. *Rev Bras Saúde Mater Infant* 2005; 5 (1): 9-53.
17. Saikali Cj, Soubhia CS, Scalfaro BM, Cords TA. Imagem corporal nos transtornos alimentares. *Rev Psiq Clin* 2004; 31 (4): 164-6.
18. Serrano SQ, Vasconcelos MGL, Silva GAP, Cerqueira MMO, Pontes CM. Percepção do adolescente obeso sobre as repercussões da obesidade em sua saúde. *Rev Esc Enferm* 2010; 44 (1): 25-31.
19. Leite SN, Vasconcelos MPC. Adesão à terapêutica medicamentosa: elementos para a discussão de conceitos e pressupostos adotados na literatura. *Ciênc Saúde Coletiva* 2003; 8 (3): 775-82.
20. Vieira MA, Atihê RD, Soares RC, Damiani D, Setian N. Adesão inicial ao tratamento de adolescentes obesos em programas de redução de peso. *Pediatria*. São Paulo. 2004; 26 (4): 240-6.
21. Tsiros MD, Sinn N, Brennan L, Coates AM, Walkley JW, Petkov J, Howe PRC, Buckley JD. Cognitive Behavioral Therapy improves diet and body composition in overweight and obese adolescents. *AM J Clin Nutr* 2008; 87 (5): 1134-40.
22. Parizzi MR, Cunha CF, Ferreira RA, Lamounier JA, Listgarten MA, Magalhães GA. Abordagem interdisciplinar do adolescente obeso com ênfase nos aspectos psicossociais e nutricionais. *Rev Med* 2008; 18 (4 Suppl. 1): S154-S160.
23. Lazorick S, Peaker B, Perrin EM, Schmid D, Pennington T, Yow A, Du Bard CA. Prevention and Treatment of Childhood Obesity: Care Received by a State Medicaid Population. *Clin Pediatr* 2011; 50 (9): 816-26.
24. Dias AM, Cunha M, Santos A, Neves A, Pinto A, Silva A, Castro S. Adesão ao regime terapêutico na doença crônica: revisão da literatura. *Millenium* 2011; 40: 201-19.
25. Duarte MTC, Cyrino AP, Cerqueira ATAR, Nemes MIB, Iyda M. Motivos do abandono do seguimento médico no cuidado a portadores de hipertensão arterial: a perspectiva do sujeito. *Ciênc saúde Coletiva* 2010; 15 (5): 2603-10.
26. Pontieri FM, Bachion MM. Crenças de pacientes diabéticos acerca da terapia nutricional e sua influência na adesão ao tratamento. *Ciênc Saúde Coletiva* 2010; 15 (1): 151-60.
27. Ye S, Krupka DJ, Davidson, KW. Diagnosing medication nonadherence in a patient with myocardial infarction. *Front Psychol* [serial on the internet] DOI: 10.3389/fpsyg.2012.00267. 2012 August 3; 263 (3) [cited 2013 Jan 20] Availlable from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3411184/.
28. Vreeman RC,Nyandiko WM, Ayaya SO, Walumbe EG, Marrero DG, Inui TS. Factors sustaining pediatric adherence to antiretroviral therapy in Western Kenya. *Quali Health Res* 2009; 19 (12): 1716-29.
29. Rolley JX, Davidson PM, Dennison CR, Ong A, Everett B, Salamonson Y. Medication adherence self-report instruments: Implications for practice and research. *J Cardiovasc Nurs* 2008; 23 (6): 497-505.
30. Beusterien KM,Davis EA, Flood R, Howard K, Jordan J. HIV patient insight on adhering to medication: A qualitative analysis. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV* 2008; 20 (2): 251-9.
31. Wu SM, Whiteside U, Neighbors C. Differences in inter-rater reliability and accuracy for a treatment adherence scale. *Cognitive Behaviour Therapy* 2007; 36 (4): 230-9.
32. Dorsey KB, Wells C, Krumholz HM, Concato JC. Diagnosis, Evaluation, and Treatment of Childhood Obesity in Pediatric Practice. *Arch Pediatr Adolesc Med* 2005; 159 (7): 632-8.
33. Gomes Villas Boas LC, Foss MC, Freitas MCF, Torres HC, Monteiro LA, Pace AE. Adesão a dieta e ao exercício físico das pessoas com diabetes mellitus. *Texto Contexto* 2011; 20 (2): 272-9.
34. Gomes Villas Boas LC, Foss MC, Freitas MCF, Pace AE. Relação entre apoio social, adesão aos tratamentos e controle metabólico de pessoas com diabetes mellitus. *Rev. Latino-Am Enfermagem* [serial on the Internet]. 2012 Jan-fev; 20 (1) [cited 2013 Jan 20] Available from: http://www.scielo.br/pdf/rlae/v20n1/pt_08.pdf.
35. Busnello FM, Bodanese LC, Pellanda LC, Santos ZEA. Intervenção nutricional e o impacto na adesão ao tratamento em pacientes com Síndrome Metabólica. *Arq Bras Cardiol* 2011; 97 (3): 217-24.
36. Kirk S, Scott BJ, Daniels SR. Pediatric obesity epidemic: treatment option. *J Am Diet Assoc* 2005; 105 (5): 44-51.
37. Ludwig DS. Weight loss strategies for adolescents a 14-year-old struggling to lose weight. *JAMA* 2012; 307 (5): 498-508.
38. Brasil. Ministério da Saúde. Secretaria de vigilância em saúde. Programa nacional de DST e AIDS. Série A. Normas e Manuais Técnicos. Manual de adesão ao tratamento para pessoas vivendo com HIV e AIDS - Série Manuais n.84, Brasília – DF, 2008.
39. Holli BB, Calabrese RJ. Communication and education Skills for dietitians *in* Communication and education Skills - The dietitians s Guide. Philadelfhia. Ed Lea & Febiger. 1986.
40. Catela AI. Viver a adesão ao regime terapêutico: experiências vividas do doente submetido a transplante cardíaco. *Pensar Enfermagem* 2010; 14 (2): 39-54.
41. Scerri J, Ferguson E, Scerri CA. Health perceptions and adherence to diet. *Journal of the Malta College of Pharmacy Practice* 2007; 13: 33-6.
42. Assunção TS, Ursine PGS. Estudo de fatores associados à adesão ao tratamento não farmacológico em portadores de

diabetes mellitus assistidos pelo Programa Saúde da Família, Ventosa, Belo Horizonte. *Ciênc Saúde Coletiva* 2008; 13 (2): 2189-97.
43. Skelton JA & Beech BM. Attrition in Paediatric weight management: a review of the literature and new directions. *Obesity Reviews* 2011; 12: e273-e271.
44. Story MT, Neumark-Stzainer DR, Sherwood NE, Holt K, Sofka D, Trowbridge FL, Barlow SE. Management of child and adolescent obesity: attitudes, barriers, skills and training needs among health care professionals. *Pediatrics* 2002; 110 (1): 210-4.
45. Mello ED, Luft VC, Meyer F. Atendimento ambulatorial individualizado versus programa de educação em grupo: qual oferece mais mudança de hábitos alimentares e de atividade física em crianças obesas? *Jornal de Pediatria* 2004; 80 (6): 468-74.
46. Afonso CT, Cunha CF, Oliveira TRPR. Tratamento da obesidade na infância e adolescência: uma revisão da literatura. *Rev Med Minas gerais* 2008; 18 (4 Suppl. 1): S131-S138.
47. Mello ED, Luft VC, Meyer F. Obesidade infantil: como podemos ser eficazes? *Jornal de Pediatria* 2004; 80 (3): 173-82.
48. Monge-Rojas R, Garita C, Sánchez M, Muñoz L. Barriers to and motivators for healthful eating as perceived by rural and urban Costa Rican adolescents. *J Nutr Educ Behav* 2005; 37: 33-40.
49. Stevensona C, Dohertya G, Barnett J, Muldoona OT, Trewa K. Adolescents views of food eating: identifying barriers to healthy eating. *Journal of adolescence* 2007; 30: 417-34.
50. Toral N, Conti MA, Slater B. A alimentação saudável na ótica dos adolescentes: percepções e barreiras á sua implementação e características esperadas em materiais educativos. *Cad Saúde Pública* 2009; 25 (11): 2386-94.
51. Rossi A, Moreira EAM, Rauen MS. Determinantes do comportamento alimentar: uma revisão com enfoque na família. *Rev Nutr* 2008; 21 (6): 739-48.
52. Viana V, Santos PL, Guimarães MJ. Comportamento e hábitos alimentares em crianças e jovens: uma revisão da literatura. *Psicologia, Saúde e Doença* 2008; 9 (2): 209-31.
53. Rodrigues EM, Boog MCF. Problematização como estratégia de educação nutricional com adolescentes obesos. *Cad Saúde Pública* 2006; 22 (5): 923-31.
54. Barbieri AF. Obesidade na adolescência: aspectos de adesão e permanência em programa de tratamento multiprofissional pautado na terapia comportamental. *Revista da faculdade de educação física da Unicamp* 2011; 9 (1): 1-23.
55. Tershakovec AM, Kuppler K. Ethnicity, Insurance Type and Follow-up in a Pediatric Weight Management Program. *Obesity Research* 2003; 11 (1): 17-20.
56. Resnicow K, Davis R, Rollnick S. Motivational Interviewing for Pediatric Obesity: Conceptual Issues and Evidence Review. *J Am Diet Assoc* 2006; 2024-33.
57. Reiners AAO, Azevedo RCS, Vieira MA, Arruda ALG. Produção bibliográfica sobre adesão/não adesão de pessoas ao tratamento de saúde. *Ciênc Saúde Coletiva* 2008; 13 (Suppl. 2): 2299-306.
58. Silveira LMC, Ribeiro VMB. Grupo de adesão ao tratamento: espaço de "ensinagem" para profissionais de saúde e pacientes. *Interface – Comunic Saúde Educ* 2005; 9 (16): 91-104.
59. Klein JM, Gonçalves AGA. A adesão terapêutica em contexto de cuidados de saúde primários. *Psico-USF* 2005; 10 (2): 113-20.
60. Gusmão JL, Mion D Jr. Adesão ao tratamento – conceitos. *Rev Bras Hipert* 2006; 13 (1): 23-5.
61. Bertolozzi MR, Nichiata LYI, Takahashi RF, Closak SI, Hino P, Val LF, Guanillo MCTU, Pereira EG. Os conceitos de vulnerabilidade e adesão na saúde coletiva. *Rev Esc Enferm* 2009; 43 (2): 1326-30.
62. Assis MAA, Nahas MV. Aspectos motivacionais em programas de mudança de comportamento alimentar. *Rev Nutr* 1999; 12 (1): 33-41.
63. Junges JR, Barbiani R, Soares NA, Fernandes RBP, Lima MS. Saberes populares e cientificismo na estratégia saúde da família: complementares ou excludentes? *Ciênc Saúde Coletiva* 2011; 16 (11): 4327-35.
64. Caprara A, Rodrigues J.A relação assimétrica médico-paciente: repensando o vínculo terapêutico. *Ciênc Saúde Coletiva* 2004; 9 (1): 139-46.
65. Minayo MCS. O desafio do conhecimento – pesquisa qualitativa em saúde. São Paulo – Rio de Janeiro; Editora Hucitec-Abrasco; 7ª edição; 2000.
66. Chimenti BM et al.Estudo sobre adesão: fatores intervenientes na dieta hipocalórica de corionaropatas internados em um hospital público de São Paulo. *Revista Brasileira de Nutrição Clínica* 2006; 21 (3): 204-10.
67. Bautista-Castaño I, Cabrillana JM, Montoya-Allonso JA, Serra-Majem L. Variables predictive of adherence to diet and phisical activity recommendations in the treatment of obesity and overweight, in a group of Spanish Subjects. *Int J Obes Relat Metab Disord* 2004; 28 (5): 697-705.
68. Brambilla P, Pozzobon G, Pietrobelli A. Physical activity as the main therapeutic tool for metabolic syndrome in childhood. *International Journal of Obesity* 2010; 35: 16-28.
69. Carvalho MC, Martins A. A obesidade como objeto complexo: uma abordagem filosófico-conceitual. *Ciênc Saúde Coletiva* 2004; 9 (4): 1003-12.
70. Santos AM. O excesso de peso da família com obesidade infantil. *Revista Virtual Textos e Contextos* [serial on the internet] 2003 Dez; nº2 [cited 2012 Sept 5] Available from: http://revistaseletronicas.pucrs.br/fo/ojs/index.php/fass/article/viewFile/964/744.
71. Ades L, Kerbauy RR. Obesidade: realidades e indagações. *Psicologia* 2002; 13 (1): 197-216.