

Protocol to implement nutritional interventions for the management of childhood obesity in Primary Health Care

Protocolo de intervenções nutricionais para o manejo da obesidade infantil na Atenção Primária à Saúde
Protocolo de intervenciones nutricionales para el manejo de la obesidad infantil en Atención Primaria de la Salud

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Abstract

Objective: To create and validate a protocol to implement nutritional interventions for the management of childhood obesity in the Primary Health Care scope. **Methods:** This is a methodological study organized into three phases: elaboration of a systematic review of the “overview” type using the PRISMA recommendations; preparation of the clinical protocol; and content validation using the AGREE II and AGREE-REX instruments. **Results:** A total of 17 studies were included to create the protocol, indicating effectiveness in interventions with outcomes in a significant BMI reduction, change in eating behaviors and habits, and increase in the knowledge level about healthy eating. The clinical protocol assessment obtained a score >70% and, according to the parameter used (≥50% high quality), it was considered adequate for implementation in the children's health field, more specifically in the management of childhood obesity. **Conclusion:** A care protocol for the management of childhood obesity in the Primary Health Care scope positively represents a sustainable and flexible strategy with performance of several social actors such as health professionals and family members, among others, contributing to reducing risks of comorbidities associated with obesity and health costs, as well as to promoting healthier behaviors in the pediatric population.

Descriptors: Primary Health Care; Pediatric Obesity; Obesity Management; Clinical Protocols.

Whats is already known on this?

There is no standard treatment for obesity, and the current recommendations emphasize reducing caloric intake, higher energy expenditure and changes in lifestyle.

What this study adds?

The study presents various non-pharmacological interventions with effective potential in the management of obesity, aiming to combine environmental, behavioral and nutritional aspects to promote significant changes in the child population.



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Resumo

Objetivo: Construir e validar um protocolo de intervenções nutricionais para o manejo da obesidade infantil no âmbito da Atenção Primária à Saúde. **Métodos:** Trata-se de um estudo metodológico, organizado em três fases: elaboração de uma revisão sistemática do tipo overview, com uso das recomendações PRISMA, construção do protocolo clínico e validação do conteúdo com uso dos instrumentos AGREE II e AGREE-REX. **Resultados:** Foram incluídos 17 estudos para a construção do protocolo, indicando efetividade em intervenções com desfechos na redução significativa do IMC, mudança no comportamento e hábitos alimentares, aumento no nível de conhecimento sobre alimentação saudável. A avaliação do protocolo clínico obteve uma pontuação >70% e, conforme o parâmetro utilizado (≥50% qualidade alta), foi considerado adequado para implementação no campo da saúde da criança, mais especificamente no manejo da obesidade infantil. **Conclusão:** Um protocolo assistencial para o manejo da obesidade infantil no âmbito da Atenção Primária à Saúde representa de forma positiva uma estratégia sustentável e flexível com atuação de diversos atores sociais como profissionais da saúde e familiares, dentre outros, contribuindo para a redução de riscos de comorbidades associadas à obesidade e custos de saúde, bem como para promover comportamentos mais saudáveis na população pediátrica.

Descritores: Atenção Primária à Saúde; Obesidade Infantil; Manejo da Obesidade; Protocolos Clínicos.

Resumen

Objetivo: Construir y validar un protocolo de intervenciones nutricionales para el manejo de la obesidad infantil en el ámbito de la Atención Primaria de la Salud. **Métodos:** Estudio metodológico organizado en tres fases: elaboración de una revisión sistemática del tipo overview, siguiendo las recomendaciones PRISMA; creación del protocolo clínico; y validación del contenido utilizando los instrumentos AGREE II y AGREE-REX. **Resultados:** Se incluyeron 17 estudios para diseñar el protocolo, indicando efectividad en las intervenciones con efectos de reducción significativa del IMC, cambios conductuales y en los hábitos alimenticios, y aumento en el nivel de conocimiento sobre alimentación saludable. La evaluación del protocolo clínico obtuvo una puntuación >70% y, conforme al parámetro utilizado (≥50%: alta calidad), se lo consideró adecuado para ser implementado en el campo de la salud infantil, más específicamente en el manejo de la obesidad en niños. **Conclusión:** Un protocolo asistencial para el manejo de la obesidad infantil en el ámbito de la Atención Primaria de la Salud representa en forma positiva una estrategia sustentable y flexible con la activa participación de diversos actores sociales como profesionales de la salud y familiares, entre otros, contribuyendo así a reducir riesgos de comorbidades asociadas a la obesidad y costos de salud, al igual que a promover comportamientos más saludables en la población pediátrica.

Descriptores: Atención Primaria de Salud; Obesidad Infantil; Manejo de la Obesidad; Protocolos Clínicos.

INTRODUCTION

Obesity is a chronic non-communicable syndrome, complex and of multifactorial etiology, resulting from the excessive accumulation of lipids in adipose tissue.⁽¹⁾ In children, obesity is defined when there are standard deviations above their Body Mass Index (BMI), that is, when their weight is higher than the one advised for their age and height.⁽²⁾

The World Health Organization (WHO) recognizes childhood obesity as a global public health epidemic, with high prevalence both in developed and developing countries, associated with Chronic Non-Communicable Diseases (CNCDs), affecting children and adolescents early in life.⁽³⁾

The role of health professionals who promote and participate in the food education of children and adolescents, parents and guardians, and encourage schools to provide formative education for healthy eating, is essential for the management and prevention of childhood obesity.⁽⁴⁾

It is important to highlight that there is no standard treatment for childhood obesity; however, the current recommendations cover reduction of caloric intake, behavioral changes, increased energy expenditure and family collaboration. At this point, Primary Health Care (PHC) plays a fundamental role, considered the gateway to health services, as well as for the development and implementation of strategies and actions in the management of childhood obesity, enabling individuals to be monitored at different life stages, having access to assistance and preventive care, providing opportunities to apply non-pharmacological and more equitable and economic interventions.⁽⁵⁾

However, there is still certain difficulty implementing efficient strategies that enable and promote healthier environments; therefore, using systematically designed clinical protocols can promote evidence-based interventions benefiting children with obesity or overweight, in addition to reducing economic costs.⁽⁶⁾

A nutritional assistance protocol for children in Primary Health Care, based on the eating paradigm currently adopted in Brazil, which consists of health promotion actions, excessive weight gain prevention and intersectoral and community articulation, will be positive in order to promote a healthy and sustainable diet in this life phase, which may exert a positive long-term impact, reducing risk for diseases and health costs. Thus, the study aims at creating and validating a protocol to implement nutritional interventions for the management of childhood obesity in the Primary Health Care scope.

METHODS

This is a methodological study that was developed in three stages: 1) a systematic review of the “overview” type, to identify the most effective interventions in the management of childhood obesity in the scientific literature; 2) development of a protocol to implement nutritional interventions for the management of childhood obesity in Primary Health Care; and 3) validation of the material by experts.

Systematic reviews of the “overview” or “review of reviews” type are characterized by using explicit and systematic methods to research and identify several systematic reviews on the same research question, with the purpose of extracting and analyzing their results, thus obtaining the most important evidence on the theme. In general, they are similar to intervention reviews, but the unit of search, inclusion and data analysis is the systematic review itself, not the primary studies.⁽⁷⁾

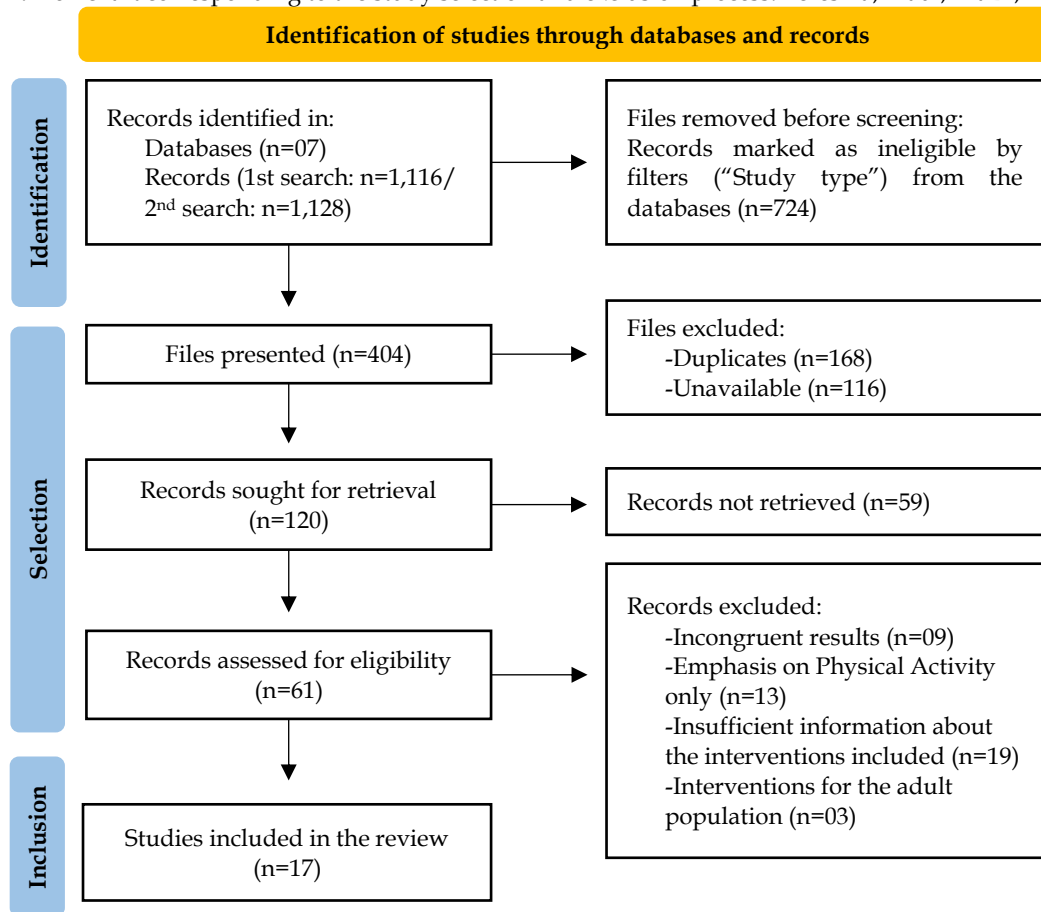
The review was developed according to the following stages: identification of the study topic and guiding question; identification of the pre-selected and selected studies; evaluation of the studies included; interpretation of the results; and presentation of the review/knowledge synthesis.⁽⁸⁾ In addition to that, the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) recommendations were adopted.⁽⁹⁾

The following was established as guiding question: Which non-pharmacological interventions are effective for reducing BMI in children aged from 05 to 11 years old who present excess weight (overweight or obese)? The PICOT strategy was adapted, which means P (Population), I (Intervention/Exposure), C (Comparator), O (Outcome) and T (Type of study/design).⁽¹⁰⁾

The PICOT strategy elements were consulted in the Descriptors in Sciences and Health, MeSH terms and CINAHL titles, and the following descriptors were identified: “*Obesidade Pediátrica* (Pediatric Obesity)”, “*Criança* (Child)”, as well as these alternative terms: “*Obesidade infantil* (Infant Obesity)”, “*Sobrepeso infantil* (Infant Overweight)”, “*Nutrição* (Nutrition)”, “*Educação* (Education)”, “*Alimentos, dieta e nutrição* (Diet, food and nutrition)”, “*Terapia nutricional* (Nutrition Therapy)”, “*Nutrição da criança* (Child Nutrition)”, “*Protocolos clínicos* (Clinical Protocols)”, “*Comportamento alimentar* (Feeding Behavior)”, “*Manejo da obesidade* (Obesity Management)”, “*Índice de massa corporal* (Body Mass Index)”, “*Perda de peso* (Weight Loss)” and “*Revisão sistemática* (Systematic review)”.

The boolean operator used to connect the terms was “AND”, and “AND” or “OR” between descriptor and later the search in the CINAHL, PubMed, SciELO, Science Direct and Scopus databases. Full-text scientific articles were used as inclusion criteria, available in their entirety, that met the study guiding question, and that were systematic reviews (as creation the protocol aimed at retrieving the largest number of interventions with potential for effectiveness in the clinical practice); and the following exclusion criteria were adopted: incomplete texts; scoping reviews; abstracts; theses and dissertations; and duplicate studies.

Study selection was performed by pairs (with Kappa between 0.81 and 1.00 and 95% CI). Eventually, 17 studies were selected according to Figure 1, carefully evaluated for the methodological quality using the AmStar⁽¹¹⁾ and Robis 2.0⁽¹²⁾ instruments and the diverse scientific evidence was evaluated using the Grade System.⁽¹³⁾

Figure 1. Flowchart corresponding to the study selection and exclusion process. Teresina, Piauí, Brazil, 2022. N=17

Source: Prepared by the authors (2022).

Based on the results obtained in the Systematic Review, the clinical protocol was developed grounded on the model proposed by the Teaching and Research Management of the *Conceição* Hospital Group for Clinical Guidelines/Care Protocols of Porto Alegre, which describes the presentation, organization and structuring of the care flowchart.⁽¹⁴⁾

The instruments used for validation were the Appraisal of Guidelines for Research and Evaluation (AGREE II), with 23 items involving six quality domains. Each domain item is scored according to the judge's assessment, which can range from 12 to 84 points.⁽¹⁵⁾ The second tool employed was Appraisal of Guidelines Research and Evaluation - Recommendations EXcellence (AGREE-REX), which is a complement to AGREE II, with nine items organized into three theoretical domains that should be considered to ensure that the protocol recommendations are of high quality.⁽¹⁶⁾

Choice of the specialists was through the intentional non-probabilistic sampling technique, as it allows researchers to define the judges of their own free will, considering each one's speciality on the theme under study.⁽¹⁷⁾

The AGREE II instrument recommends that the analysis be carried out by at least two and preferably four evaluators. They were selected according to searches in the Lattes curriculum platform delimited to the location and area of professional concentration, and evaluated according to the criteria proposed in the studies by Guimarães et al. (2016),⁽¹⁸⁾ who assigned scores according to training and professional experience, on a scale from 01 (lowest score) to 10 (highest score).

Data analysis was performed using calculations standardized by the AGREE II instrument itself, and the scoring criteria adopted were proposed by Parra-Anguita, Granero-Moya and Pancorbo-Hidalgo,⁽¹⁹⁾ based on the AGREE II calculation results, in which scores less than or equal to 25% represent very low quality; above 25%-50%, low quality; above 50%-75%, high quality; and above 75%, very high quality.

Both instruments used have a Likert scale from 1 (lowest grade) to 7 (highest grade), and calculation of scores considering the following: $\text{Score obtained} - \text{Minimum Score} / \text{Maximum Score} - \text{Minimum Score} \times 100$.⁽¹⁵⁾

The research was approved by the Ethics and Research Committee (*Comitê de Ética e Pesquisa, CEP*), with approval under Opinion number 4,348,722.

RESULTS

The evidence synthesis considered 17 studies as eligible for creating the clinical protocol; the description of the studies regarding retrieval database, title, author/year and the type of intervention addressed can be seen in Chart 1.

Chart 1. Characterization of the studies selected, Teresina, Piauí, Brazil, 2022. N=17

Database/Order	Title	Author/Year	Type of intervention
CINAHL A1	Effective behaviour change techniques in the prevention and management of childhood obesity ⁽²⁰⁾	Martin; Chater; Lorencatto (2013)	Behavioral change interventions
CINAHL A2	Best practice dietetic management of overweight and obese children and adolescents: a 2010 update of a systematic review ⁽²¹⁾	Ho et al. (2013)	Nutritional, behavioral change and family interventions
PubMed A3	Impact of weight management nutrition interventions on dietary outcomes in children and adolescents with overweight or obesity: a systematic review with meta-analysis ⁽²²⁾	Duncanson et al. (2020)	Nutritional intervention
PubMed A4	The effectiveness of intervention programs in the prevention and control of obesity in infants: a systematic review ⁽²³⁾	Pitangueiras, Silva and Costa (2015)	Educational intervention
PubMed A5	Systematic review of paediatric weight management interventions delivered in the home setting ⁽²⁴⁾	Appelhans, Moss and Cerwinske (2016)	Home-based and educational intervention
PubMed A6	Current Recommendations for Nutritional Management of Overweight and Obesity in Children and Adolescents: A Structured Framework ⁽²⁵⁾	Pfeiffle et al. (2019)	Nutritional intervention
PubMed A7	Nutrition Education and Body Mass Index in Grades K-12: A Systematic Review ⁽²⁶⁾	Price et al. (2017)	Nutritional and educational intervention
PubMed A8	Effectiveness of school-based nutrition education interventions to prevent and reduce excessive weight gain in children and adolescents: a systematic review ⁽²⁷⁾	Silveira et al (2011)	Educational intervention
SciELO A9	Does family mealtime have a protective effect on obesity and good eating habits in young people? A 2000-2016 review ⁽²⁸⁾	Tosatti et al. (2017)	Parental intervention
Science Direct A10	Integration of public health and primary care: A systematic review of the current literature in primary care physician mediated childhood obesity interventions ⁽²⁹⁾	Bhuyan et al. (2015)	Behavioral, educational and technological intervention
Scopus A11	Childhood Obesity Prevention Interventions in Childcare Settings: Systematic Review of Randomized and Nonrandomized Controlled Trials ⁽³⁰⁾	Zhou et al. (2014)	Nutritional intervention
Scopus A12	Effectiveness of pre-school- and school-based interventions to impact weight-related behaviours in African American children and youth: a literature review ⁽³¹⁾	Robinson et al. (2014)	Educational intervention
Scopus A13	Promoting Healthy Eating among Young People – A Review of the Evidence of the Impact of School-Based Interventions ⁽³²⁾	Chaudhary, Sudzina and Mikkelsen (2020)	Nutritional, educational and technological intervention

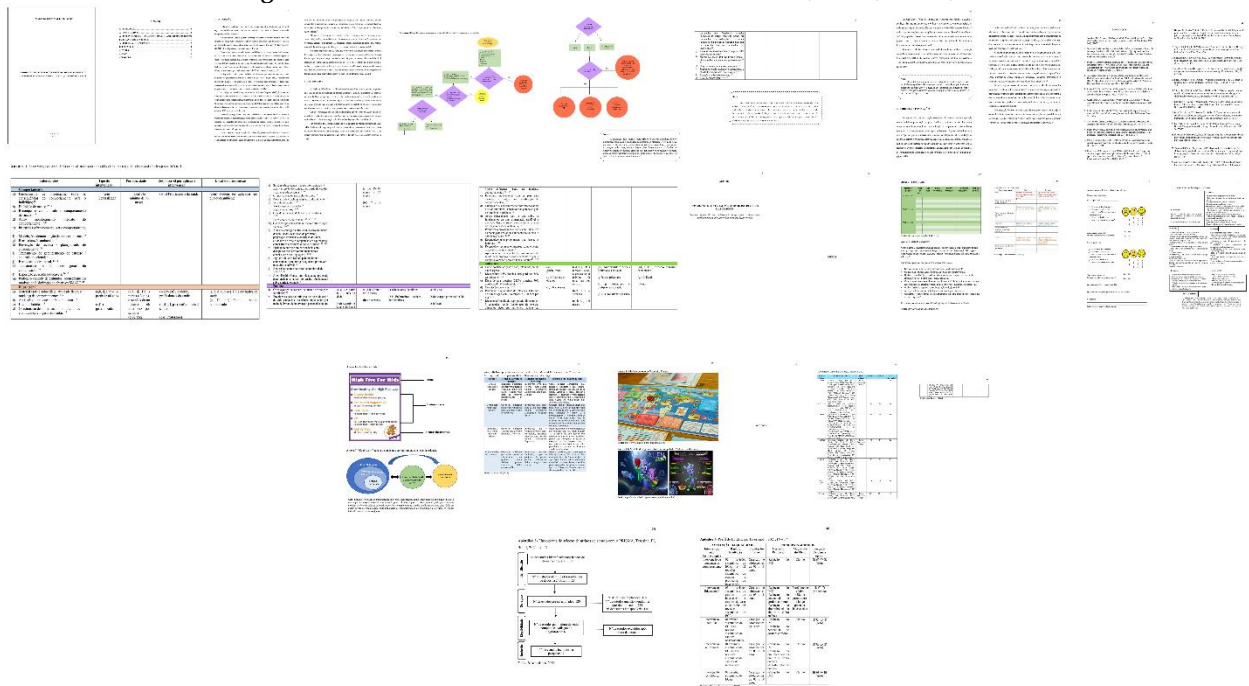
Scopus A14	Treating Obesity in Preschoolers: a review and recommendations for addressing critical gaps ⁽³³⁾	Towner et al. (2016)	Nutritional and behavioral change intervention
Scopus A15	The prevention of overweight and obesity in children and adolescents: a review of interventions and programmes ⁽³⁴⁾	Doak et al (2006)	Nutritional and educational intervention
Scopus A16	School-Based Interventions for Health Promotion and Weight Control: not just waiting on the world to change ⁽³⁵⁾	Katz (2009)	Nutritional and educational intervention
Scopus A17	Parent participation in weight-related health interventions for children and adolescents: A systematic review and meta-analysis ⁽³⁶⁾	Niemeier; Hektner; Enger (2012)	Nutritional and educational intervention

Source: Databases (2022).

The methodological quality assessment identified that most of the sample had an evaluation between high and moderate; as for the risk of bias assessment, the studies were mostly classified as with low risk of bias.

Preparation of the protocol followed these guidelines: Times New Roman font text, size 12; Flowchart algorithms as recommended above; Bibliography: Vancouver format; Authorship of all authors who contributed to the protocol creation process; Annexes and appendix if necessary⁽¹⁴⁾ (Figure 2).

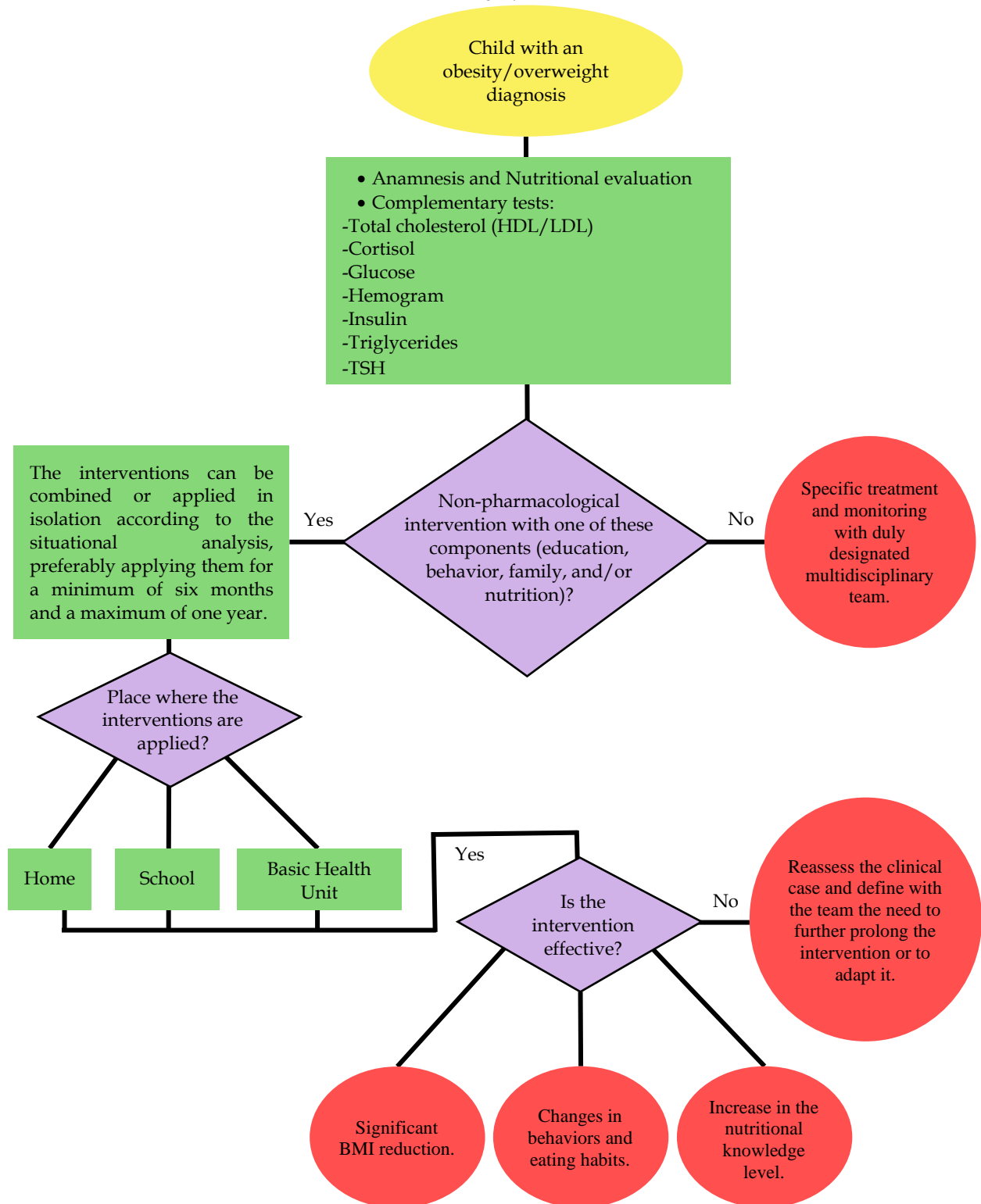
Figure 2. Illustration of the Clinical Protocol. Teresina, Piauí, Brazil, 2022.



Source: Prepared by the authors (2022).

Based on all the evidence found, the flowchart was elaborated (Figure 3) taking into account the findings regarding the primary outcome and the effect size in children with childhood obesity; the studies mostly presented interventions with positive results in reducing BMI. Basic health units and the home and school environments were highlighted as preferred environments for the interventions, and application of the interventions was considered at the multiprofessional level.

Figure 3. Care flowchart for obesity/overweight in children in the Primary Health Care scope. Teresina, Piauí, Brazil, 2022.



Source: Prepared by the authors (2022).

The content was validated by 05 judges, of whom 03 professionals had a PhD degree and the others were specialists working in the children's health area and/or in the development and evaluation of health technologies and had clinical and research experience in the topic area, therefore being considered able and qualified to analyze the guideline. The mean values obtained from the evaluation are described in Chart 2.

Chart 2. Evaluation according to AGREE II and AGREE REX. Teresina, Piauí, Brazil, 2022.

AGREE II DOMAIN	SCORE
Scope and Purpose	87%
Stakeholder Involvement	70%
Development Rigor	92%
Presentation Clarity	74%
Applicability	83%
Editorial Independence	57%
AGREE REX DOMAIN	SCORE
Clinical Applicability	89%
Values and Preferences	71%
Implementability	100%

Source: Research data (2022).

According to the classification proposed by Parra-Anguita, Granero-Moya and Pancorbo-Hidalgo⁽¹⁹⁾, all domains obtained scores above 50%; thus, the clinical protocol was considered adequate and of good quality to be implemented in the clinical practice.

DISCUSSION

Obesity is considered an epidemic that affects the pediatric population in large proportions, hence the essential need to establish efficient strategies that cause changes in this scenario. Interventions based on changing eating behavior patterns and life habits represent strategies with effective potential in reducing the BMI indices when well-delimited in relation to the intervention period, environment and frequency.⁽²⁹⁾

Although there are public policies aimed at promoting children's health at the Primary Health Care and other levels, in practice, the guidelines and services offered do not yet correspond to the recommended model.⁽³⁷⁾ However, at this point it is fundamental to highlight the role of the Primary Care professionals to work with children and adolescents with obesity, where they should seek strategies to manage childhood obesity that involve the family, as children's behavior is influenced in the family environment.⁽³⁸⁾

Therefore, health technologies such as protocols represent an effective strategy to guide the professionals' decisions in the workplace and the organization of services provided to users.⁽³⁹⁾

Among the appropriate environments for to implement actions for the management of childhood obesity, Primary Health Care and schools stand out, as they are environments that promote an association between domestic and technological elements, ensuring that the place is as compatible as possible with the child's everyday life, allowing the integration of parents and professionals in applying the interventions.^(22,25)

It is worth noting that care protocols are created through scientific evidence considered as with a high reliability standard that can be reproduced in other contexts. Thus, the professionals have access to diverse information that has gone through a systematic and rigorous analysis process to assist in decision-making and promote greater equality in the provision of care.⁽⁴⁰⁾

In addition to that, elaboration and implementation of protocols are considered theoretical-practical support tools, as they favor care planning and quality of the individual and collective assistance provided.⁽⁴¹⁾ In this context, a clinical protocol represents a favorable technology in the Primary Care scope, aimed at the management of childhood obesity, guiding the professionals' practice and making it possible to establish effective actions that promote healthier eating habits.

The clinical protocol has strengths because it was structured based on scientific evidence, presenting a variety of interventions evaluated through 17 systematic reviews, being validated through an international AGREE II instrument and obtaining a high score for its implementation; however, it presents the following limitations: non-performance of a pilot test, which can identify the effectiveness and adaptation of interventions in the clinical practice, in addition to cost-benefit; such aspects can be overcome with the development of future research studies and by disseminating the protocol among health managers and professionals.

CONCLUSION

Considered a public health problem, childhood obesity evidences the need to implement strategies that promote prevention and control in children. The evidence shows that the interventions to combat

childhood obesity focused on education, attitudes and nutrition are effective; however, it is necessary to take into account that such measures have their own flexible characteristics and can be adapted to different realities, thus making them accessible and fair. It is important to highlight that this type of intervention presents results according to the individual's routine, depending on time, intensity and changes in habits

Implementation of the protocol in PHC will establish alternative interventions in the management of childhood obesity, as there is no standard treatment. Therefore, the protocol gathers several divided interventions considering periodicity, the professionals responsible for the application and the ideal place to carry out the interventions, helping the professionals who make up the multiprofessional team to determine through an evaluation of the child and the available resources which intervention would be the most suitable for application and monitoring, aiming at each child's needs. In addition to that, the interventions provided for in the protocol can be applied by parents or education professionals as long as they have been guided by a health professional, promoting joint activities that reinforce the *Saúde na Escola* (School Health) program actions, as well as the dissemination of information about obesity in the community.

In view of this, a care protocol for the management of childhood obesity in the Primary Health Care scope positively represents a sustainable and flexible strategy with the performance of several social actors such as health professionals and family members, among others, contributing to reducing the risks of comorbidities associated with obesity and health costs, as well as to promoting healthier behaviors in the pediatric population.

It is hoped that the results found may contribute to the professional practice and to establishing projects and actions in the management of childhood obesity, and that they may be useful in the creation of interventional studies that strengthen the diverse evidence associated with the effectiveness of non-pharmacological interventions to prevent and combat childhood obesity.

CONTRIBUTIONS

Contributed to the conception or design of the study/research: Silva CO, Pereira FGF, Lima LHO. Contributed to data collection: Silva CO, Pereira FGF, Lima LHO, Claro ML. Contributed to the analysis and/or interpretation of data: Silva CO, Pereira FGF, Claro ML, Lima LHO. Contributed to article writing or critical review: Silva CO, Pereira FGF, Lima LHO, Sousa AF, Silva DMC. Final approval of the version to be published: Pereira FGF, Lima LHO, Sousa AF, Silva DMC.

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