International Journal of Nutrology
(Official Journal of the ABRAN - Brazilian Association of Nutrology)

REVIEW ARTICLE

DOI: 10.54448/ijn25401

Family and community medicine as an important primary care tool for managing patients with obesity: a systematic review

Mariana de Almeida Lima[1*], Ana Kellen Padilha Correia de Lima[2]

[1] Federal University of Mato Grosso, Cuiabá, Mato Grosso, Brazil.
[2] Federal University of Rio Grande, Rio Grande do Sul, Brazil.

*Corresponding authors: Mariana de Almeida Lima.
Federal University of Mato Grosso,
Cuiabá, Mato Grosso, Brazil.
E-mail: marianaalmeida62@hotmail.com
DOI: https://doi.org/10.54448/ijn25401
Received: 07-05-2025; Revised: 08-28-2025; Accepted: 08-30-2025; Published: 09-01-2025; IJN-id: 25401

Editor: Dr. Idiberto José Zotarelli-Filho, MSc, Ph.D., Post-Doctoral.

Abstract

Introduction: Obesity stands out as a multifactorial disease that can cause several public health problems. Currently, more than 30% of the world's population is overweight or obese, representing more than 2.3 billion people. Family and community medicine plays a crucial role in the primary care of patients with obesity and their families. **Objective:** This systematic review examined the relevant aspects of obesity and its comorbidities as a societal burden, as well as the role of family and community medicine as a crucial primary care tool for managing patients with obesity. **Methods:** The PRISMA Platform systematic review guidelines were followed. The search was conducted from May to June 2025 in the Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases. Study quality was based on the GRADE instrument, and risk of bias was analyzed according to the Cochrane tool. **Results and Conclusion:** A total of 123 articles were found. A total of 34 articles were evaluated, and 16 were included in this systematic review. Using the Cochrane risk of bias tool, the overall assessment revealed 16 studies with a high risk of bias and 31 studies that did not meet the GRADE and AMSTAR-2 criteria. The studies showed homogeneity in their results, with X^2=87.5%. It was concluded that obesity is a serious public health concern, representing a complex interaction between multiple genetic, socioeconomic, and cultural factors that are also associated with existing or resulting comorbidities and their treatments. The prevalence of obesity remains high, as do associated comorbidities and healthcare costs. Early primary care through family and community medicine is a significant strategy for reducing costs and improving outcomes for these patients. Awareness of obesity risk factors, especially those that are preventable, is important so that physicians can counsel patients on how to avoid or minimize them. Motivational interviewing can be effective in brief interventions to engage families in the initiation of treatment for childhood obesity in primary care. Connecting with specialist physicians can be important for supporting the engagement of adolescents with obesity. An evaluation and monitoring tool for family and community medicine residency programs can be a facilitating tool for program managers and enable evaluation and monitoring, providing ongoing training.

Keywords: Obesity. Family and community medicine. Primary care. Obesity treatment. Effective strategies.

Introduction

In the context of Chronic Noncommunicable Diseases (NCDs), obesity stands out as a multifactorial disease that can cause several public health problems **[1]**. Currently, more than 30% of the world's population is overweight or obese, representing more than 2.3 billion people. Estimates suggest that the prevalence of severe obesity in 2030 will be 11%, approximately twice the current prevalence **[2]**. In 2019, according to a survey conducted by the Ministry

of Health, 52.5% of Brazilians were overweight, a significant risk factor for NCDs [3].

In Brazil, according to the Brazilian Institute of Geography and Statistics, the prevalence of overweight adults has increased almost threefold among males (from 18.5% to 50.1%) and almost doubled among females (from 28.7% to 48.0%) over the past 34 years [3]. In the United States, the prevalence of obesity is greater than 30.0% for both sexes, and obesity is the cause of death for 2.8 million people per year, affecting 26% of adults. In Europe, it is estimated that 10 to 20% of men and 15 to 25% of women are obese [2,4,5].

The most recent Ordinances 424 and 425 of the Brazilian Ministry of Health draw special attention to the issue of excess weight. This situation is likely to worsen, as according to the Ministry of Health, there is a projected increase in adult obesity in the 26 capital cities, plus the Federal District, for those over 18 years of age. Currently, the literature addresses multidisciplinary interventions that combine several areas of health, including Physical Education, Nutrition, Psychology, Medicine, Pediatrics, Orthopedics, among others, in a juxtapositional manner [6].

Regarding the cause of obesity, there is a complex relationship between biological, psychosocial, and behavioral factors, including genetic makeup, socioeconomic status, and cultural influences. Furthermore, obesity has been associated with microorganisms, epigenetics, increased maternal age, increased fertility, lack of sleep, endocrine disruptors, pharmaceutical iatrogenesis, and intrauterine and intergenerational effects [6,7]. Comorbid conditions and their treatments may also be factors in the development of obesity. To date, the best non-invasive interventions have been dietary management and behavior modification [8].

The best results are associated with bariatric surgery. Drug therapy has limited efficacy, especially in children. Genetic testing is applicable to a small group of obese patients [9,10]. In this context, the specialty of Family and Community Medicine (FCM) was created in 1978 and, since its inception as a general specialty, has required a large number of positions in the postgraduate training program. Its academic and professional prestige has been the subject of several evaluations and offers a potential tool for controlling and managing the burden of obesity [11].

At a time when ensuring generational change among family physicians in primary care is crucial, the need to prioritize health system resources for primary care, the importance of offering working conditions that meet the needs of professionals, and the special attention that teaching units and tutors deserve are particularly relevant, especially in adapting obesity treatment to primary care [11].

In light of this, the vocational aspects of medical graduates seeking specialization, the characteristics of the specialty program and the teaching units where training is conducted, the presence of family medicine in universities as a key element for knowledge and affinity with this specialty from graduation onward, and, finally, the status of primary care as the space where training is materialized and the priority setting for the professional practice of future specialists are pillars for the development and strengthening of family medicine in the care of patients with obesity and their families [12]. However, it is noted that the training, recruitment, and retention of primary care professionals are constant challenges in Brazil. The recent expansion of FCM residency programs in the country coexists with gaps in the literature on the effects of this process [13,14].

Consequently, this study conducted a systematic review to explore the relevant aspects of obesity and its comorbidities as a societal burden, as well as the role of family and community medicine as an important primary care tool for the management of patients with obesity.

Methods

Study Design

This study followed the international systematic review model, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines. Available at: http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1. Accessed on: May 26, 2025. The AMSTAR-2 (Assessing the Methodological Quality of Systematic Reviews) methodological quality standards were also followed. Available at: https://amstar.ca/. Accessed on: May 26, 2025.

Data Sources and Search Strategy

The literature search process was conducted from May to June 2025 and developed based on Web of Science, Scopus, Embase, PubMed, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various periods to the present day. The following descriptors (DeCS/MeSH Terms) were used: "*Obesity. Family and community medicine. Primary care. Obesity treatment. Effective strategies*" and the Boolean "and" between MeSH terms and "or" between historical findings were used.

Study Quality and Risk of Bias

Quality was classified as high, moderate, low, or very low based on risk of bias, clarity of comparisons,

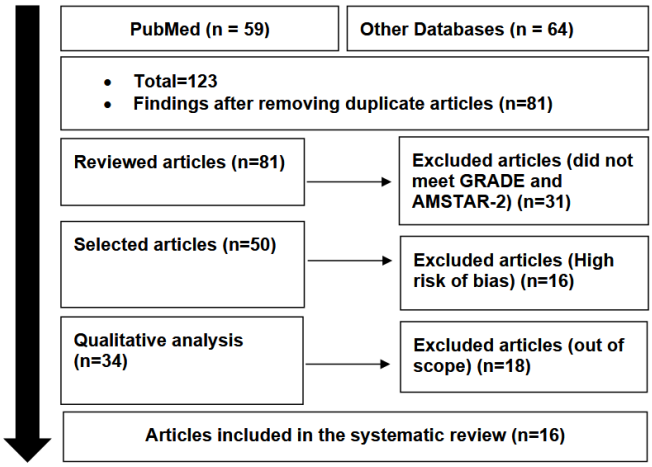
precision, and consistency of analyses. The most prominent factors were systematic reviews or meta-analyses of randomized controlled trials, followed by randomized clinical trials. Low-quality evidence was attributed to case reports, editorials, and brief communications, according to the GRADE instrument. Risk of bias was analyzed according to the Cochrane instrument by analyzing the funnel plot (sample size versus effect size) using Cohen's d test.

Results and Discussion

Summary of Findings

A total of 123 articles were found and submitted to eligibility analysis, with 16 final studies selected to comprise the results of this systematic review (Figure 1). The selected studies were of medium to high quality, considering the level of scientific evidence from studies such as meta-analysis, consensus, randomized clinical trials, prospective, and observational studies. Biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies presented homogeneity in their results, with X^2=87.5%>50%. Considering the Cochrane risk of bias tool, the overall assessment resulted in 16 studies with a high risk of bias and 31 studies that did not meet the GRADE and AMSTAR-2 criteria.

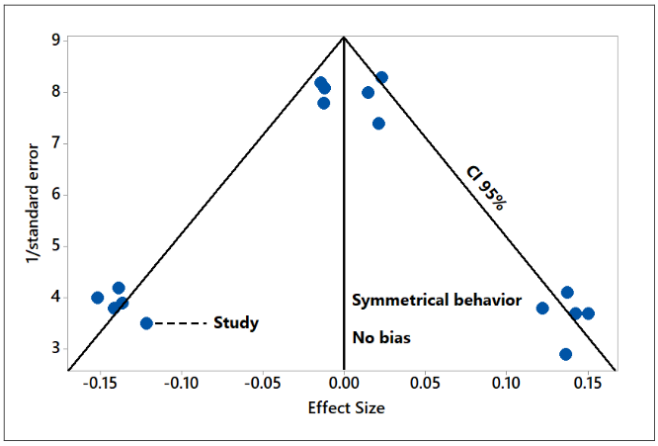
Figure 1. Selection of articles by exclusion based on GRADE and AMSTAR-2.



Source: Own authorship.

Figure 2 presents the results of the risk of bias of the studies using the funnel plot, showing the calculation of the effect size (magnitude of the difference) using Cohen's d test. Precision (sample size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph exhibited symmetrical behavior, suggesting no significant risk of bias, either among studies with small sample sizes (lower precision), shown at the bottom of the graph, or among studies with large sample sizes, shown at the top.

Figure 2. The symmetrical funnel plot suggests no risk of bias among the studies with small sample sizes, shown at the bottom of the graph. High-confidence and high-recommendation studies are shown above the graph (n=16 studies).



Source: Own authorship.

Historical Context and Approaches of Family and Community Medicine

To understand and discuss the practice of Family and Community Medicine (FCM) in Brazil, it is important to understand the context in which it has developed and the daily challenges it faces. Brazil is a country of continental dimensions with significant socioeconomic inequality among its various regions and social strata. Its federative model grants significant autonomy to states and municipalities in the management and control of their public policies, which favors heterogeneity in how they are implemented throughout the country. The country has two health systems that have coexisted for almost three decades: a public and universally accessible system, the Unified Health System (SUS), and a private system, represented by the health plan and insurance market **[15]**.

FCM in Brazil is still practiced predominantly in primary health care within the SUS. The specialty was recognized by the National Commission for Medical Residency in 1981 (at the time under the name of Community General Medicine), three years after the Alma-Ata Conference (Kazakhstan), in a context characterized by the efforts of several nations and the World Health Organization in the search for solutions to the crisis of the hegemonic model of health care, understood as fragmented, expensive, and inefficient **[1]**.

The Family Health Program (FHP), created by the Ministry of Health in 1994, can be considered the Brazilian response, in the field of public health policy, to the Alma-Ata recommendations **[16]**. Initially, it was selective and targeted at populations and regions with the greatest risk and vulnerability. However, it

later expanded its scope and, with the creation of the Family Health Strategy (FHS), proposed to be the gateway to the system and offer comprehensive health care to the entire population using the SUS. With the FHS (Family Health Strategy), Brazilian primary health care has grown over the last two decades and now has 42,000 basic health units (UBS) covering 72% of the national territory. The most common team format sponsored by the Ministry of Health and representing over 90% of the total in primary health care is the family health team, comprised of a general practitioner, nurse, nursing technician, and community health workers. Fewer in number are "traditional" teams composed of general practitioners, obstetricians, and pediatricians, the predominant team format in Brazil in the 1970s and 1980s **[16,17]**.

The expansion of primary health care in Brazil has not been accompanied by a sufficient increase in medical training, nor in the number of family medicine specialists. Consequently, a historical bottleneck in filling medical positions on these teams can be observed. Even with the implementation of the *Mais Médicos Program*, which has allocated 18,000 new primary care professionals since 2013, most of them foreign, unused medical positions are still common. This is a problem that involves both a quantitative aspect, as Brazil still has a lower ratio of doctors per thousand inhabitants compared to other countries with universal health systems, and also concerns the profile of the doctors trained, most of whom are directed toward hospital specializations **[17]**.

Primary health care is managed directly by city governments, which are responsible for maintaining the physical infrastructure of the primary health care units (UBS), supplying services, and managing the workload. The hiring process for professionals varies widely, with temporary work often being established, especially in smaller municipalities. Some cities (among them Rio de Janeiro and São Paulo, the two largest in the country) have outsourced primary health care management to non-profit organizations, known as social organizations. This management model, however, has been criticized by social movements and experts, who point to problems related to transparency in contracts and the weakening of labor relations **[18]**.

Primary health care as a care coordinator is still a distant reality in Brazil. To be able to perform this function, it is necessary to be able to mobilize and decide on the resources available in the network (beds, procedures, specialized consultations, supplies). The rhetoric of primary health care as the coordinator of care doesn't hold up for a moment when a family physician who follows a patient longitudinally and knows them well recommends hospitalization and, in order to secure a bed, is forced to refer the patient to another service (such as an Emergency Care Unit) to secure a bed **[19]**.

In this context, working in areas of poverty and high social vulnerability, a common situation in Brazil, has been a challenge for those involved, especially for exercising obesity control through primary care. These areas are characterized by precarious sanitation, housing, and transportation conditions. In recent years, the problems have been compounded by an explosion in unemployment and worsening violence associated with the so-called "war on drugs," resulting from the impoverishment of the population and the constant clashes between the state's law enforcement apparatus and drug trafficking. **[19]**

It is necessary to identify possible contributions that family physicians can make to the development of primary health care and the SUS in Brazil in the treatment of obesity. A first contribution concerns the consolidation and qualification of FCM residencies, which have seen a significant increase in vacancies following the implementation of the *Mais Médicos Program*, with the creation of 4,700 vacancies over the last three years. Joining the preceptorship of these residencies, investing in their own teacher training, and pushing for improvements in the practice areas appear to be central tasks at this time in the country to ensure the consolidation of a health care model centered on primary health care **[20]**.

A second contribution concerns the role that family physicians (FCM) can play in consolidating a new legal framework for regulating interdisciplinary healthcare work in Brazil. Because they have a strong history of multidisciplinary advocacy and practice, family physicians are uniquely positioned to engage in dialogue and participate in legal and institutional arrangements that prioritize dialogue with other healthcare professions, overcoming conflictual relationships between organizations over the reservation or expansion of their labor markets **[19,20]**.

A third contribution concerns FCM as a discipline and its connections with other fields of knowledge. As a medical specialty, FCM has invested in recent years in consolidating a core of knowledge and practices characterized by a clinical approach centered on the person (rather than the disease), continued care, and the management of individual and family therapeutic plans. The community dimension, in turn, is approached almost exclusively through an epidemiological lens, particularly in the context of obesity. Although essential, this consolidation of a core discipline of FCM does not appear to be sufficient to elucidate new and old questions that impact family

physician practices **[21]**.

Family and Community Medicine in the Treatment of Obesity

Authors Laroche et al. (2024) **[22]** evaluated an obesity intervention for lowincome families through a 12-month randomized controlled trial, combining family health coaching (motivational interviewing) and connection to community resources. A total of 208 families were included (one parent with a body mass index **[BMI]** ≥ 30 and one child aged 6 to 12 years). The parents were 95% female, 31% Black, and 27% Hispanic. The children had a mean BMI Z-score of 1.15. Primary outcomes did not differ between groups at 12 months. Both groups showed significant improvement ($p<0.05$) on the Family Nutrition and Physical Activity Scale for childhood obesity-related behaviors (mean ± standard error: comparison, 2.8 ± 1.0; intervention, 2.2 ± 0.9), increased childhood sedentary activity (comparison, 32.5 ± 12.1; intervention, 39.9 ± 12.4 min/d), and decreased childhood moderate-to-vigorous physical activity (comparison, -9.6 ± 3.3; intervention, -7.0 ± 3.0 min/d).

Furthermore, Hoosen et al. (2024) **[23]** described, through a randomized clinical trial, the development and feasibility testing of a time-restricted feeding (TRF) intervention in overweight/obese women (20-45 years old) with HIV receiving TRF treatment in a resource-limited community setting. Participants in the in-depth interviews participated in a 4-week, single-arm TRF pilot trial, in which feasibility was explored in terms of reach, acceptability, applicability, and implementation integrity. Participants included 33 women (mean age 37.1 years, mean BMI 35.9 kg/m²). Thematic analysis identified psychological capacity (knowledge about fasting), social influences (cultural preferences, family support), and reflective motivation (weight awareness, health impact, motivation for TRF) as key factors influencing TRF adoption for weight management. In a 4-week TRF pilot trial (n=12), retention was 100%. Positive outcomes observed included increased energy, appetite control, and weight loss. Adherence was high, aided by self-selected eating times, reminders, and weekly phone calls. Recommendations included incorporating dietary education sessions and text messages to provide additional support and reminders.

A randomized controlled trial by Sy et al. (2025) **[24]** examined the influence of neighborhood socioeconomic deprivation on the effectiveness of an intensive lifestyle intervention in the Look AHEAD study, randomizing overweight/obese adults with type 2 diabetes to intensive lifestyle intervention for weight loss or Diabetes Support and Education (DSE). Among 1,213 participants at baseline, the mean age was 60 years, 41% were male, and 65% identified as White, 26% as Black, and 4% as Hispanic. Deprivation scores ranged from -12.04 to -2.61 in the most deprived tertile and from 2.01 to 18.69 in the least deprived tertile (the lower the score, the greater the deprivation). There were no statistically significant differences between treatments based on deprivation scores in weight or HbA1c changes over the 4-year period. In this trial population, an intensive lifestyle intervention was equally effective across all levels of neighborhood socioeconomic deprivation.

Appelhans et al. (2025) **[25]** conducted a randomized controlled trial (CHECK) to examine whether home-based pediatric weight management interventions improve weight loss outcomes compared to clinic-based interventions. The families included 269 children (137 boys) aged 6 to 12 years, overweight/obese, and living in low-income households. All families received a 12-month pediatric weight management intervention with 18 planned in-person sessions and 12 planned telephone contacts. The only difference between the arms was the location (home vs. clinic) of the in-person intervention sessions. Intention-to-treat analyses compared treatment arms based on 12month BMI z-score (zBMI) change, intervention session attendance and contact time, and secondary clinical outcomes. Twelve-month zBMI change did not differ ($p=0.58$) between the home care (n=133; -0.031, SD=0.26) and clinic care (n=136; -0.002, SD=0.30) groups. In both groups, session attendance and total contact time predicted greater reductions in zBMI. Both variables were greater in the home care group (median=11 sessions, 500 minutes) than in the clinic care group (median=6.5 sessions, 315.5 minutes; $p<0.001$). Post hoc analyses indicated that the home-based intervention (compared to the clinic-based intervention) led to 0.03 (SE = 0.008, $p = 0.0004$) greater reductions in zBMI.

Patterson et al. (2024) **[26]** evaluated the effect of a universal school-based family support program on the BMI of children aged 5 to 7, using pooled data from three clinical trials. The program has three to four components and is implemented during the first school year. Its goal is to promote healthy eating and physical activity behaviors and, secondarily, to prevent unhealthy weight gain. Three cluster-randomized clinical trials were conducted between 2010 and 2018 in low- and mixed-socioeconomic areas in Sweden. A total of 961 children were included (50% girls, mean age 6.3 years). The postintervention effect on BMI z-score in all children was small, but in those with obesity at baseline, a significant and clinically relevant decrease in BMI z-score (-0.21) was observed. This

was more pronounced in children with non-Nordic parents (-0.24).

A clinical study determined the association between motivational interviewing (MI) training for pediatricians and caregiver adherence to health behavior and lifestyle (HBL) treatment during the Wellness Coaching for Kids (WC4K) implementation study. Eligible children were between 3 and 8 years of age at the time of caregiver referral for HBL, with a body mass index (BMI) ≥85th percentile for age and sex. Two years after the program began, the proportion of referred caregivers who engaged in HBL coaching was analyzed according to the pediatricians' MI training status. Among 233 pediatricians from 24 intervention clinics, 53% (n=123) participated in MI training and 44% (n=102) referred at least one caregiver for coaching. Of the 19,888 eligible children, 10.3% (n = 2,045) were referred for well-being coaching (reached). Reach was higher among pediatricians trained in MI compared to those untrained (20.4 ± 10.1% and 7.0 ± 10.2%, respectively, p = 0.003). Among those referred, 49.9% (n=1,021) scheduled a coaching appointment, and 43.3% (n = 886) received at least one coaching call. Adherence among caregivers with MI-trained pediatricians was significantly higher (OR 2.3; 95% CI 1.4, 3.6) than among those with untrained pediatricians **[27]**.

A randomized clinical trial described the strategies used to recruit adolescents with obesity for the Fast Track to Health (Fast Track) trial. Youth aged 13 to 17 years with obesity and ≥1 cardiometabolic complication were recruited. Families underwent telephone screening, followed by in-person consultations. Recruitment strategies were grouped, and enrollment yield by strategy was calculated. Of the 308 consultations received, 141 (45.8%) adolescents were recruited. The most successful strategy was referral by specialists from participating centers (21.2% adherence), followed by referrals from family/friends (6.5%), other physicians/general practitioners (3.6%), and social media (3.6%). Social media was used for only 11 months (adherence yield - 8.5%). Lowyielding recruitment strategies were study flyers/posters (1.6%), digital/print media (1.3%), and the study website (1.0%). Of the 137 adolescents excluded from the telephone screening, the majority did so due to a lack of interest in participating or inability to contact them (60.6%). Of the 171 adolescents who attended the in-person screening, 30 did not meet the inclusion criteria (n = 7 of those excluded did not have metabolic complications, n = 7 were outside the BMI range) **[28]**.

Finally, based on the aforementioned clinical studies, aimed at improving FCM in the treatment of obesity, a study by Ribeiro, Cyrino, and Pazin-Filho (2023) **[29]** presented an instrument to assess and monitor the quality of FCM medical residency programs based on preceptors and residents, considering the program's integration into the healthcare network. The instrument was developed in three stages: 1) interview with FCM preceptors; 2) literature review; and 3) production, adaptation, and approval of the assessment instrument by renowned FCM professionals in Brazil. The third stage involved nine people and used the Delphi technique, with 80% agreement. Five evaluation cycles were conducted to adapt the proposed recommendations, eliminating one item and weighting them. The methodology used to analyze the results of 10 resulting items resulted in a matrix designed for organizing residency programs in the healthcare network, divided into three domains: Unit Organization, Human Resources, and Preceptor-Resident Relationship.

Limitations

More research is needed to identify methods for improving recruitment into primary care, community settings, and online for obesity treatment through family and community medicine. Future research can explore ways to make these interventions more accessible, valuable, and effective for patients with obesity and their families.

Conclusion

Obesity is a serious public health concern, representing a complex interplay of multiple genetic, socioeconomic, and cultural factors that are also associated with existing or resulting comorbidities and their treatments. The prevalence of obesity remains high, as do associated comorbidities and healthcare costs. Early primary care through family and community medicine is a significant strategy for reducing costs and improving outcomes for these patients. Awareness of obesity risk factors, especially those that are preventable, is important so that physicians can counsel patients on how to avoid or minimize them. Motivational interviewing can be effective in brief interventions to engage families in the initiation of treatment for childhood obesity in primary care. Connecting with specialist physicians can be important for supporting the engagement of adolescents with obesity. An evaluation and monitoring tool for family and community medicine residency programs can be a facilitating tool for program managers and enable evaluation and monitoring, providing ongoing training.

CRediT

Author contributions: **Conceptualization-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Data curation-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Formal Analysis-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Investigation-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Methodology-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Project administration-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Supervision-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Writing - original draft-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima; **Writing-review & editing-** Mariana de Almeida Lima, Ana Kellen Padilha Correia de Lima.

Acknowledgment

Not applicable.

Ethical Approval

Not applicable.

Informed Consent

Not applicable.

Funding

Not applicable.

Data Sharing Statement

No additional data are available.

Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

It was applied by Ithenticate[@].

Application of Artificial Intelligence (AI)

Not applicable.

Peer Review Process

It was performed.

About The License©

References

1. Finkelstein EA, Khavjou OA, Thompson H, Trogdon JG, Pan L, Sherry B, et al. Obesity and severe obesity forecasts through 2030. Am J Prev Med 2012;42:563– 570.
2. WHO – World Health Organization. Available at: https://www.sbcbm.org.br/endoscopia-e-obesidade/ Accessed on: May 18, 2025.
3. Brazilian Institute of Geography and Statistics (IBGE). Accessed on May 15, 2025. Available at: http://www.ibge.gov.br.
4. Karamitri A, Jockers R. Melatonin in type 2 diabetes mellitus and obesity. Nat Rev Endocrinol. 2019 Feb;15(2):105-125. doi: 10.1038/s41574-018-0130-1.
5. Schetz M, De Jong A, Deane AM, et al. Obesity in the critically ill: a narrative review. Intensive Care Med. 2019;45(6):757-769. doi:10.1007/s00134-01905594-1.
6. Brazilian Association for the Study of Obesity and Metabolic Syndrome. Brazilian Obesity Guidelines 2016. 4th ed. São Paulo: ABESO, 2016. Available at: Accessed on June 20, 2025.
7. Apovian CM. Obesity: definition, comorbidities, causes, and burden. Am J Manag Care. 2016;22(7 Suppl):s176-s185.
8. Andolfi C, Fisichella PM. Epidemiology of Obesity and Associated Comorbidities. J Laparoendosc Adv Surg Tech A. 2018;28(8):919-924. doi:10.1089/lap.2018.0380.
9. Tutuian R. Obesity and GERD: Pathophysiology and effect of bariatric surgery. Curr Gastroenterol Rep 2011;13:205–212.
10. Da Luz FQ, Hay P, Touyz S, Sainsbury A. Obesity with Comorbid Eating Disorders: Associated Health Risks and Treatment Approaches. Nutrients. 2018;10(7):829. Published 2018 Jun 27. doi:10.3390/nu10070829.
11. Cánovas Zaldúa Y, Martín Álvarez R, Mas Tena A, Lema Bartolomé J, Coma E, Nadal Braqué N. Análisis de la elección de la especialidad de Medicina Familiar y Comunitaria entre los candidatos MIR en el periodo 2020 a 2024: Índice de preferencia competitiva [Analysis of the choice of the specialty of Family and Community Medicine among MIR candidates in the period 2020 to 2024: Competitive preference index]. Aten Primaria. 2025 Jun;57(6):103150. Spanish. doi: 10.1016/j.aprim.2024.103150.
12. Vázquez-Díaz JR. Medicina familiar y comunitaria: la especialidad más elegida en el MIR [Family and community medicine: The most

chosen specialty in the MIR]. Aten Primaria. 2024 May;56(5):102935. Spanish. doi: 10.1016/j.aprim.2024.102935.

13. Leite APT, Correia IB, Chueiri PS, Sarti TD, Jantsch AG, Waquil AP, Mai S, Rosa VSD, Cordero EAA, Augusto DK, Lopes AF, Pinto MEB. Family and Community Medicine Residency Programs for training the health workforce: what do municipal health managers think? Cien Saude Colet. 2021 Jun;26(6):2119-2130. Portuguese, English. doi: 10.1590/141381232021266.47052020.
14. Villafafila-Ferrero RI, Berlanga-Fernández S. Cambios en las expectativas profesionales de los residentes de medicina de familia y comunitaria [Changes in the professional expectations of family and community medicine residents]. Aten Primaria. 2024 Jan;56(1):102693. Spanish. doi: 10.1016/j.aprim.2023.102693.
15. National Supplementary Health Agency. Sector profile - general data. http://www.ans.gov.br/perfil-do-setor/dados-gerais (accessed on 11/Mar/2018)» http://www.ans.gov.br/perfil-do-setor/dados-gerais.
16. Franco TB, Merhy EE. Family Health Program (FHP): contradictions of a program aimed at changing the techno-assistance model. In: Merhy EE, Magalhães Júnior HM, Rimoli J, Franco TB, Bueno WS, organizers. Health work: looking at and experiencing the SUS in everyday life. São Paulo: Editora Hucitec; 2003. p. 55-124.
17. Giovanella L, Mendonça MH. Primary health care. In: Giovanella L, Escorel S, Lobato LVC, Noronha JC, Carvalho AI, editors. Health Policies and System in Brazil. Rio de Janeiro: Editora Fiocruz; 2012. p. 493-545.
18. Oliveira FP, Vanni T, Pinto HA, Santos JTR, Figueiredo AM, Araújo SQ, et al. More Doctors: A Brazilian Program from an International Perspective. Interface (Botucatu, Online) 2015; 19:623-34.
19. Vieira FS, Benevides RPS. The Impacts of the New Tax Regime on the Financing of the Unified Health System and the Implementation of the Right to Health in Brazil. Technical Note. http://www.ipea.gov.br/portal/images/stories/PDFs/nota_tecnica/160920_nt_28_disoc.pdf (accessed on June 21, 2025). http://www.ipea.gov.br/portal/images/stories/PDFs/nota_tecnica/160920_nt_28_ disoc.pdf
20. Cardo-Miota A, Valls-Pérez B, Lineros-González C, Hernán-García M. Salud comunitaria. Innovando en la formación de residentes de medicina familiar y comunitaria [Community health. Innovating in the training of family and community medicine residents]. Gac Sanit. 2023 Oct 12;37:102330. Spanish. doi: 10.1016/j.gaceta.2023.102330.
21. Coelho Neto GC, Antunes VH, Oliveira A. The practice of Family and Community Medicine in Brazil: context and perspectives. Cad Saude Publica. 2019;35(1):e00170917. English, Portuguese. doi: 10.1590/0102-311x00170917.
22. Laroche HH, Andino J, O'Shea AMJ, Engebretsen B, Rice S, DeJear M Jr, Nicholson C, Yeh HW, Snetselaar L. Family-Based Motivational Interviewing and Resource Mobilization to Prevent Obesity: Living Well Together Trial. J Nutr Educ Behav. 2024 Sep;56(9):631-642. doi: 10.1016/j.jneb.2024.05.227.
23. Hoosen F, Pico ML, Goedecke JH, Dave JA, Quist JS, Færch K, Grunnet LG, de Villiers A, Aagaard-Hansen J, Mendham AE. Development and feasibility testing of a time-restricted eating intervention for women living with overweight/obesity and HIV in a resource-limited setting of South Africa. BMC Public Health. 2024 Oct 10;24(1):2768. doi: 10.1186/s12889-024-20228-y.
24. Sy M, Pilla S, Bennett W, Yeh HC, Baptiste-Roberts K, Gary-Webb TL, Vaidya D, Clark JM. Influence of Neighborhood Socioeconomic Deprivation on Effectiveness of an Intensive Lifestyle Intervention. J Gen Intern Med. 2025 Jun;40(8):1728-1734. doi: 10.1007/s11606-024-09232-5.
25. Appelhans BM, French SA, Martin MA, Lui KJ, Bradley LE, Johnson TJ, Wang H, Janssen I, Suzuki S. Home-Delivered Pediatric Weight Management for Low-Income Families: A Randomized Controlled Trial. Pediatrics. 2025 Apr 1;155(4):e2024069282. doi: 10.1542/peds.2024-069282.
26. Patterson E, Nyberg G, Norman Å, Schäfer Elinder L. Universal healthy school start intervention reduced the body mass index of young children with obesity. Acta Paediatr. 2024 Sep;113(9):2119-2125. doi: 10.1111/apa.17164.
27. Moore E, Vallejo J, Sidell MA, Li X, Delacroix E, Young DR, Kunani P, Resnicow K, Koebnick C. Training in motivational interviewing for pediatricians was associated with a higher uptake of health behavior and lifestyle treatment: Results from the KP Wellness Coaching for Families and Kids (WC4K) Program. Patient Educ Couns. 2025 Aug;137:109173. doi: 10.1016/j.pec.2025.109173.

28. House ET, Ghouri H, Baur LA, Collins CE, Gow ML, Truby H, Jebeile H, Lister NB; Fast Track to Health study team. The recruitment of adolescents with obesity to a randomised controlled trial: A Fast Track to Health sub-study. Obes Res Clin Pract. 2025 May-Jun;19(3):214-222. doi: 10.1016/j.orcp.2025.04.012.

29. Ribeiro LG, Cyrino EG, Pazin-Filho A. Improving the Quality of Residency Programs in Family and Community Medicine. Rev Saude Publica. 2023 Oct 20;57:65. doi: 10.11606/s1518-8787.2023057004822.