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Review

Rasha A Almubark[1] and Saleh A Alqahtani[2,3]

[1]Scientific Affairs Department, Sharik Association for Health Research, Riyadh, Saudi Arabia (Correspondence to Rasha A Almubark: ralmubark@hotmail.com). [2]Liver Transplantation Unit, King Faisal Specialist Hospital & Research Center, Riyadh, Saudi Arabia.
[3]
Division of Gastroenterology and Hepatology, Johns Hopkins University, Baltimore, United States of America.

Abstract

Background: Prevalence estimates for overweight and obesity in the Gulf Cooperation Council countries, including Saudi Arabia, have increased over the last 4 decades. Although the World Health Organization encourages countries to implement initiatives aimed at controlling obesity, limited research has been published on the impact of such initiatives in Saudi Arabia.

Aims: To assess the epidemiology of overweight and obesity in Saudi Arabia, describe and evaluate the effectiveness of past and current interventions, and recommend actions for prevention and control.

Methods: A narrative review of data from the Global Health Observatory was used to determine yearly estimates of prevalence of overweight and obesity in Saudi Arabia from 1975 to 2016. Large-scale interventions aimed at controlling obesity and its risk factors in Saudi Arabia were identified and summarized.

Results: Prevalence estimates of overweight and obesity among men and women in Saudi Arabia continued to increase from 1990 to 2019. Prevalence among adults was more than 60%

and among children and adolescents it was 20–60%, suggesting a continuing trend. Interventions were identified but their impact on the prevention and control of obesity and its risk factors was unclear.

Conclusion: Prevalence estimates of overweight and obesity have been steadily increasing in Saudi Arabia since 1975. Integrated, “whole-of-community” approach, with continuous evaluation, is needed to achieve sustainable prevention and control of obesity in the country.

Keywords: obesity, overweight, epidemiology, whole-of-community approach, Saudi Arabia, Gulf Cooperation Council

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Introduction

Overweight and obesity in Saudi Arabia

The prevalence of overweight and obesity in Saudi Arabia has seen an upward trend over recent decades. As early as the 1990s, public health programmes were implemented to slow or reverse this trend. However, available literature on the impact of such initiatives in the country is limited.

A 2019 systematic review observed that overweight and obesity among adults had increased significantly in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates over the last 4 decades (1). Risk factors such as sociodemographic characteristics, sedentary lifestyle and an unhealthy diet were identified (1).

Research projects that began data collection in 1990 in Saudi Arabia studied risk factors for high body mass index (BMI) (2–4). A BMI of ≥ 30 kg/m2 is considered obese, and a BMI of 25.0–29.9 kg/m2 is considered overweight (5). Being female and of older age were risk factors for obesity at that time (4). Socioeconomic variables such as being in a high-income family and being illiterate were also associated with higher BMI. The prevalence estimates of overweight and obesity were highest in the Eastern Region (3). On average, BMI was lower among participants living in rural areas and leading traditional lifestyles than among those living in more urbanized environments (2).

By 1996, the prevalence estimates were already high: for obesity among women the estimate was 24% and among men 16%, and for overweight plus obesity the respective estimates were 51% and 45% (3). In a 2019 systematic review, prevalence estimates of overweight and obesity continued to increase in the Gulf Cooperation Council countries, including Saudi Arabia (1). A 2004 review noted that the prevalence of physical inactivity was 80% among adults in Saudi Arabia (6). An analysis of dietary data from 1961 to 2007 found that per capita consumption of sugar and other sweeteners and animal products, including meat, eggs and dairy, had significantly increased (7). At the same time, the proportion of vegetable fat in the diet stabilized at 67–68%, suggesting that vegetables and fruits were becoming underrepresented (7). In a recent systematic review, the highest obesity prevalence reported among large Saudi-based studies (sample size > 10 000) was 35.6% (8). The increasing trend in obesity in the country is predicted to cause 2.26 million new cases of type 2 diabetes mellitus, liver disease and liver cancer by 2040 (8). Ambitious nation-wide intervention efforts are thus crucial. A 20% reduction in the prevalence of obesity is projected to avert over 150 000 deaths by 2050 (8).

Interventions aimed at reducing obesity in Saudi Arabia

The World Health Organization (WHO) has been a leader in encouraging countries to implement interventions at all hierarchical levels to address the risk factors for obesity (6,9). An intervention is a public health programme aimed at reducing a particular condition or risk factor in the population (10). As an example, in 2018, WHO established the Global Action Plan on Physical Activity as part of the Department of Noncommunicable Disease Prevention and Health Promotion, and disseminated the annual Global Move for Health initiative, providing guidance and support to countries to develop policies and programmes aimed at increasing physical activity (11). There has been an uptake in Saudi Arabia of global health initiatives aimed at controlling obesity. In 2014, a call was made to establish an integrated national obesity control programme involving the participation of individuals, families, the community, local government and schools and colleges (through the involvement of the Ministry of Education) (12). There was a strong role for the health sector, the Ministry of Health and other sectors, including the private sector (12). As Saudi Arabia has a predominantly young population, focusing efforts on younger individuals to prevent obesity at older ages is a priority (3,13).

Several interventions have been introduced to address obesity or its risk factors at the national level. However, there is a need for an integrated approach to further strengthen these initiatives. With the implementation of the first National Transformation Programme and subsequent National Health Strategy within Vision 2030 in the health system in recent years, several efforts have been undertaken to reduce the prevalence of obesity (14).

This study aimed to summarize the trend for overweight and obesity in Saudi Arabia from 1990 to 2019, discuss the large-scale interventions undertaken to address obesity or its risk factors, and evaluate the impact of these public health interventions. The intention was to make recommendations for future directions that may be more effective than past efforts.

Method

Design

A narrative rather than a systematic review was chosen because our intention was to provide an informative description rather than an exhaustive scientific one (15). The existing evidence was too weak to be summarized in a systematic review or meta-analysis (15). However, we were as comprehensive and evidence-based as possible in presentating our results.

Prevalence estimates of overweight and obesity in Saudi Arabia

We used data from the WHO Global Health Observatory to determine the yearly estimate of overweight and obesity prevalence in Saudi Arabia from 1975 to 2016 (16). These data were submitted as annual national data by Saudi Arabia to the Global Health Observatory repository, and provided overall as well as separate estimates for men and women (16).

To better understand the problem in subgroups in Saudi Arabia, we reviewed the literature to obtain prevalence estimates for children, regional groups and other subgroups where estimates were available. We used Google Scholar, due to its comprehensive coverage (17,18), to search for the terms “Saudi Arabia”, “obesity”, “overweight”,“body weight status” and “BMI”. We limited the search to articles published in 1990 or later; we only used articles that stated a prevalence estimate of overweight and/or obesity. Although we were interested in the rates in subgroups, we did not gather data about patient subgroups (e.g. people with diabetes) as we determined this was outside the scope of the review. Review articles that provided multiple estimates were cited in place of the original citations. We gathered information on the year of data collection (or year of publication if these data were not reported), sample demographics (adolescents, national estimate, occupational subgroup, paediatric subgroup, regional subgroup), sample size and prevalence of overweight and obesity. For a visual representation of the prevalence rates,

we used the ggplot2 R package (19). We plotted datasets containing the rates of overweight and obesity on the same plot as the WHO rates to identify trends in subgroups.

Reviewing large-scale interventions aimed at obesity and risk factors in Saudi Arabia

While reviewing the literature, we also looked for information about large-scale interventions aimed at controlling obesity and its risk factors in Saudi Arabia. If a particular initiative or programme was mentioned in an article, further research was conducted to identify more information about the programme such as the programme components and outcomes. Very few programmes were documented well enough to be described here. We included the programmes and initiatives we could verify with documentation in a table, along with a description of the programme or initiative, the implementing organization and the year initiated.

Results

Overall prevalence of overweight plus obesity

In 1975, the overall prevalence of overweight plus obesity in Saudi Arabia was under 40% (Figure 1). Prevalence of overweight plus obesity was always higher among women, but the difference diminished over time. Overall prevalence of ≥ 50% obesity was reached in 1986, and the estimate continued to increase, albeit with a slight flattening. In 2016, about 60% of adults fell into the category of overweight plus obese.

Interventions

Several obesity-related initiatives have been implemented by government agencies such as the Obesity Control Programme initiated by the Ministry of Health in 2013 (9) and the Sports Boulevard Project initiated by the local Riyadh Municipal Authority in 2019 (20) (Table 1). Other initiatives have been implemented by nongovernmental organizations such as the Healthy City Programme led by the WHO, and the Arab Task Force on Obesity Prevention and Physical Activity Promotion in 2010, comprising representatives from a number of Arab countries (21,22). Annotated on the plot in Figure 1 are several obesity-related interventions initiated from 1999. Other programmes were initiated in 2016 by organizations focusing on obesity such as the Saudi Arabian Society of Metabolic and Bariatric Surgery and a collaboration between King Saud University, the Arab Nutrition Center and Mars Middle East Inc. (23).

From 1999 to 2019, several obesity-related initiatives implemented in Saudi Arabia may have impacted the obesity epidemic, either overall or among certain subgroups (Table 1).

Assessing the impact of interventions

To better understand how the initiatives may have impacted the prevalence of obesity in subgroups, estimates of overweight plus obesity were presented on a scatter plot. The data were separated into 2 periods for ease of interpretation: 1990–1999 (Figure 2) and 2000–2019 (Figure 3). Few estimates were identified in the literature before 2000 (Figure 2), only 3 national estimates, 3 regional estimates and 2 paediatric estimates were identified and added to the plot. The subgroup estimates were quite different from the overall estimates, although not enough to establish a trend. It is, however, important to note that even during this early period, the lowest overweight plus obesity estimate identified in the paediatric subgroup was almost 20%; the other subgroups had a lowest estimate of 40% (3,4,24–28).

For children and adolescents, the lowest estimates were just below 20%, and the highest were within 5% of the overall adult Global Health Observatory rate (Figure 3). This trend appears to have been constant throughout the entire period. There is no evidence that the trend changed during the period when the interventions in Table 1 , some of which targeted children, were implemented. A similar pattern was seen with the adolescent subgroup, although the highest estimates identified were within 10% of the overall adult estimate. Regional, national and occupational estimates were within 20% of the overall rate. Similar trends were seen with the adult estimates; no subgroup appeared to have lower prevalence estimates than the overall Global Health Observatory estimate.

Discussion

Our review of prevalence estimates for overweight plus obesity in the general population and in subgroups in Saudi Arabia from 1975 until 2019 showed no evidence of levelling off: estimates appear to continue to increase, although the rate of increase slowed. The interventions that were implemented may have led to this easing, but no formal programme evaluations were identified that assessed the connection between this phenomenon and the impact of any particular programme. As the analysis showed, some subgroups had lower prevalence estimates than the general population and a few were higher. Given the increasing trend, one concern is that the younger populations may develop overweight and obesity to the same extent as older groups.

The importance of effective public health interventions should not be underestimated. In addition to the lack of formal, evidence-based evaluations of the interventions identified in Table 1 ,

it is important to be aware of the nature of the interventions (29). They all appear to be “top-down” interventions initiated by policy. Operational capacity, funding and a planned programme evaluation are essential for successful implementation.

These top-down interventions could be compared with similar interventions which have undergone extensive programme evaluation, such as Shape Up Somerville (30). Like many of the interventions listed in Table 1, especially the Sports Boulevard Project, Shape Up Somerville was a community health intervention in Somerville, Massachusetts (United States of America), aimed at improving food intake and physical activity rates with a specific focus on children (30). Like the Al-Haraka Baraka initiative (31), Shape Up Somerville started by focusing on schools, but the programme was extended beyond school hours and into the community (30). Their initial programme had many components, including a breakfast programme, walking programmes, revision of school activities to include more health components, healthy after school activities and community actions, including working with restaurants to develop healthy menus (30). After the first year, children in the Shape Up Somerville community were compared with children in 2 control communities to assess how effective the intervention had been (30). A continued impact was demonstrated after 2 years (30).

Shape Up Somerville is an example of a “whole-of-community” obesity prevention effort, and the Shape Up Somerville articles represent programme evaluations of multilevel and multicomponent (MLMC) interventions (10). In a recent review of 14 MLMC interventions to improve health outcomes, 5 of the 8 studies that reported obesity showed no significant impact but others showed significant reductions in obesity (10). Because these were MLMC interventions, many other positive outcomes were reported such as improved dietary behaviour and physical activity patterns (10). It was concluded that MLMC approaches were promising, and were most effective if they could be integrated at the policy level, the community level (including health care) and the interpersonal level (10).

It is likely that the individual efforts listed in Table 1 would have been more effective if integrated into an MLMC. If the school-based interventions in the Healthy City Initiative and Al-Haraka Baraka were actually part of a larger MLMC, which also included the RASHAKA programme and the Sports Boulevard Project, and extended from the school setting into the community and family setting, more possibilities would exist. Family events could be conducted in a community setting that connected with school-based interventions and used environmental spaces designed for physical activity. However, this would involve monumental coordinating efforts as was the case with Shape Up Somerville. The results show, however, that if these efforts were sustained over many years and were regularly subject to programme evaluations that could shed light on their efficiency, they could reverse the upward trend of obesity in a population.

Our analysis has both strengths and limitations. The main strength, which is also the main point of the article, is that it collated estimates of overweight and obesity in Saudi Arabias as reported in the literature over time in the context of public health interventions aimed at controlling obesity and its risk factors over the same period. Although this information was available in the literature, it had not all been assembled together to provide a complete picture.

In terms of limitations, the original studies producing the estimates considered in Figures 2 and 3 may not have been of high quality, and thus, these estimates may not have been accurate. The lack of information on the nature, duration and outcomes of the interventions precluded any evaluation of their efficiency. In addition, the methodological approach used in this review could not evaluate or assess interventions. Therefore, our review only described the interventions and did not assess their impact or efficiency.

Even with these limitations, this review provides information that has been historically missing about public health interventions aimed at controlling obesity in Saudi Arabia and recommends ways to improve future interventions.

Conclusion

Prevalence estimates of overweight and obesity have been steadily increasing in Saudi Arabia since 1975. The various initiatives incorporate components that would likely be successful if integrated into a larger and more comprehensive MLMC and sustained for multiple years with continuous programme evaluations. Using this approach, optimal programmes can be designed to control obesity in the population.

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Competing interests: None declared.

Épidémiologie de l'obésité et interventions en Arabie saoudite

Résumé

Contexte : Les estimations de la prévalence du surpoids et de l'obésité dans les pays du Conseil de Coopération du Golfe, y compris l'Arabie saoudite, ont augmenté au cours des quatre dernières décennies. Bien que l'Organisation mondiale de la Santé encourage les pays à

mettre en œuvre des initiatives visant à lutter contre l'obésité, peu de recherches ont été publiées sur l'impact de ces initiatives dans le pays.

Objectif : Évaluer l'épidémiologie du surpoids et de l'obésité en Arabie saoudite, décrire et évaluer l'efficacité des interventions passées et actuelles, et recommander des mesures de prévention et de lutte.

Méthodes : Un examen narratif des données de l'Observatoire mondial de la santé a été effectué afin de déterminer les estimations annuelles de la prévalence du surpoids et de l'obésité en Arabie saoudite entre 1975 et 2016. Des interventions à grande échelle destinées à lutter contre l'obésité et ses facteurs de risque dans le pays ont été identifiées et résumées.

Résultats : Les estimations de la prévalence du surpoids et de l'obésité chez l'homme et la femme en Arabie saoudite ont continué à augmenter entre 1990 et 2019. La prévalence chez l' adulte était supérieure à 60 % et celle chez l'enfant et l'adolescent se situait entre 20 % et 60 %, indiquant une tendance persistante. Des interventions ont été identifiées, mais leur impact sur la lutte contre l'obésité et ses facteurs de risque, ainsi que sur leur prévention, n'est pas clair.

Conclusion : Les estimations de la prévalence du surpoids et de l'obésité en Arabie saoudite sont en constante augmentation depuis 1975. Il est nécessaire d'adopter une approche intégrée pour l'ensemble de la communauté, accompagnée d'une évaluation continue, afin d'assurer de manière durable la prévention de l'obésité et la lutte contre cette affection dans le pays.

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4. Al-Nuaim AR. Population-based epidemiological study of the prevalence of overweight and obesity in Saudi Arabia, regional variation. Ann Saudi Med. 1997 Mar;17(2):195–9. doi:10.5144/0256-4947.1997.195

5. Samara A, Andersen PT, Aro AR. Health Promotion and obesity in the arab gulf states: challenges and good practices. J Obes. 2019;2019:4756260. doi:10.1155/2019/4756260. PMID: 31281673

6. Al-Hazzaa HM. The public health burden of physical inactivity in Saudi Arabia. J Family Community Med. 2004;11(2):45–51. PMID: 23012048

7. Adam A, Osama S, Muhammad KI. Nutrition and food consumption patterns in the Kingdom of Saudi Arabia. Pak J Nutr. 2014;13(4):181–90. doi:10.3923/pjn.2014.181.190

8. Salem V, AlHusseini N, Abdul Razack HI, Naoum A, Sims OT, Alqahtani SA. Prevalence, risk factors, and interventions for obesity in Saudi Arabia: A systematic review. Obes Rev. 2022 Jul;23(7):e13448. doi:10.1111/obr.13448

9. Al-Hazzaa HM, AlMarzooqi MA. Descriptive analysis of physical activity initiatives for health promotion in Saudi Arabia. Front Public Health. 2018 Nov 14;6:329. doi:10.3389/fpubh.2018.00329

10. Ewart-Pierce E, Ruiz MJM, Gittelsohn J. “Whole-of-community” obesity prevention: a review of challenges and opportunities in multilevel, multicomponent interventions. Curr Obes Rep. 2016;5(3):361–74. doi:10.1007/s13679-016-0226-7

11. Let’s be active. Global action plan on physical activity 2018–2030. Geneva: World Health Organization; 2018 (https://www.who.int/news-room/initiatives/gappa, accessed 15 April 2023).

12. Al-Khaldi Y, Alshehri F, Aljoudi A, Rahman S, Abu-Melha W, Mashour M, et al. Towards an

integrated national obesity control program in Saudi Arabia. Saudi J Obes. 2014;2(2):49–53. doi:10.4103/2347-2618.147342

13. Population by gender, age group and nationality (Saudi/Non-Saudi). General Authority for Statistics; 2020 (https://www.stats.gov.sa/en/5680, accessed 24 June 2020).

14. Vision 2030. Riyadh: Government of Saudi Arabia; 2017 (http://vision2030.gov.sa/en, accessed 7 Apr 2017).

15. Sutton A, Clowes M, Preston L, Booth A. Meeting the review family: exploring review types and associated information retrieval requirements. Health Info Libr J. 2019 Sep;36(3):202–22. doi:10.1111/hir.12276

16. Global Health Observatory data repository. Prevalence of overweight among adults, BMI ≥ 25, age-standardized. Estimates by country. Geneva: World Health Organization; 2020 (https://apps.who.int/gho/data/view.main.CTRY2430A?lang=en, accessed 13 December 2020).

17. Falagas M, Pitsouni E, Malietzis G, Pappas G. Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. FASEB J. 2008 Feb;22(2):338–42. doi:10.1096/fj.07-9492LSF

18. Gehanno JF, Rollin L, Darmoni S. Is the coverage of Google Scholar enough to be used alone for systematic reviews. BMC Med Inform Decis Mak. 2013;13:7. doi:10.1186/1472-6947-13-7

19. R Core Team. A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing; 2014 (http://www.R-project.org, accessed 15 April 2023).

20. Sports Boulevard Project. Riyadh; Royal Comission for Riyadh City; 2020 (https://www.rcrc.gov.sa/en/projects/sports-boulevard-project, accessed 15 April 2023).

21. A short guide to implementing the healthy city programme [Internet]. Cairo: World Health Organization Regional Office for the Eastern Mediterranean; 2010 (https://apps.who.int/iris/handle/10665/119915, accessed 15 April 2023).

22. Musaiger AO, Al Hazzaa HM, Al-Qahtani A, Elati J, Ramadan J, AboulElla NA, et al. Strategy to combat obesity and to promote physical activity in Arab countries. Diabetes Metab Syndr Obes. 2011 Mar 8;4:89–97. doi:10.2147/DMSO.S17322

23. Khoja T, Melha WA, AlKhaldi Y, Mirza M, Bawahab M, Mufti A, et al. Abha document on control of overweight and obesity in Saudi Arabia. Saudi J Obes. 2016;4(2):88–92. doi:10.4103/2347-2618.197706

24. Binhemd T, Larbi EB, Absood G. Obesity in a primary health care centre: a retrospective study. Ann Saudi Med. 1991 Mar;11(2):163–6. doi:10.5144/0256-4947.1991

25. Al-Shammari SA, Khoja TA, al-Maatouq MA, al-Nuaim LA. High prevalence of clinical obesity among Saudi females: a prospective, cross-sectional study in the Riyadh region. J Trop Med Hyg. 1994 Jun;97(3):183–8. PMID: 8007060.

26. Alsaif MA, Hakim IA, Harris RB, Alduwaihy M, Al-Rubeaan K, Al-Nuaim AR, et al. Prevalence and risk factors of obesity and overweight in adult Saudi population. Nutr Res. 2002 Nov 1;22(11):1243–52. doi:10.1016/S0271-5317(02)00439-6

27. El-Hazmi MA, Warsy AS. Prevalence of overweight and obesity in diabetic and non-diabetic Saudis. East Mediterr Health J. 2000 May;6(2–3):276–82. PMID: 11556013

28. El-Hazmi MA, Warsy AS. Prevalence of obesity in the Saudi population. Ann Saudi Med. 1997 May;17(3):302–6. doi:10.5144/0256-4947.1997.302

29. Padgett DK, Thyer BA, Royse D. Program evaluation: an introduction to an evidence-based approach. Boston: Cengage Learning; 2015:434.

30. Economos CD, Hyatt RR, Goldberg JP, Must A, Naumova EN, Collins JJ, et al. A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. Obesity (Silver Spring). 2007 May;15(5):1325–36. doi:10.1038/oby.2007.155

31. Al Haraka Baraka (movement is a blessing) programme, Saudi Arabia. Cairo: World Health Organization Regional Office for the Eastern Mediterranean; 2020 (http://www.emro.who.int/health-education/physical-activity-case-studies/haraka-barakat-saudi.html, accessed 15 April 2023).

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