

Nutrition and Public Health in Georgia: Reviewing the current status and inspiring improvements: A joint event of the Georgian Nutrition Society, The Nutrition Society of the UK and Ireland and the Sabri Ülker Foundation, October 2023

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Abstract

Georgia lies to the north east of Türkiye, having a western border on the Black Sea. With a population of some 3.73 million, Georgia has a tradition of gastronomic excellence dating back millennia. However, changing lifestyles and external influences have, as elsewhere, led to problems of suboptimal nutrition, and lifestyle related diseases and disorders prevail. There is considerable scope for improving the focus on public health and nutrition in Georgia. With this in mind, the Georgian Nutrition Society teamed up with The Nutrition Society of the United Kingdom and Ireland and the Sabri Ülker Foundation, a public health charity based in Istanbul, Türkiye, to host a conference and workshops in Tbilisi, Georgia. The primary purpose was to review the current status of public health and nutrition in Georgia with reference to the situation elsewhere, to share examples of best practice and to identify opportunities for improvement. A particular highlight was the presentation of a programme of nutrition education for family physicians recently implemented in Türkiye. This summary of the proceedings is intended as a blueprint for action in Georgia and also to inspire others to consider how public health might be improved via a focus on balanced nutrition.

Abbreviations

AfN, Association for Nutrition; ANS, Academy of Nutrition Sciences; BDA, British Dietetic Association; BMI, Body Mass Index; BNF, British Nutrition Foundation; DALY, Disability Adjusted Life Years; DiRECT, Diabetes Remission Clinical Trial; EPIC, European Prospective Investigation into Cancer; FAO, Food and Agriculture Organization of the United Nations; GNS, Georgian Nutrition Society; IDF, International Diabetes Federation; NCD, Non-Communicable Disease; NS, The Nutrition Society of Great Britain and Ireland; PH, Public Health; PHSG, Public Health Specialist Group; RD, Registered Dietitian; RSPH, Royal Society for Public Health; SÜF, Sabri Ülker Foundation; UKVRN, UK Voluntary Register of Nutritionists; WHO, World Health Organization; YLD, Years Lived with Disability

Introduction

The contribution of optimum nutrition to public health has been brought into sharp focus as the disparity between overall life expectancy and healthy life expectancy increases in many countries around the world. Georgia has a rich gastronomic tradition and during the latter part of the 20th Century the Scientific Research Institute of Sanitation, Hygiene and Medical Ecology in Tbilisi took a lead in food hygiene research and teaching. However, circumstances have changed and today Georgia has a lower life expectancy than that of neighbouring Türkiye and throughout Europe. The country does not currently have the infrastructure required to offer formal qualifications in dietetics or nutrition, nor does it have an accreditation procedure for practitioners. The GNS, the NS and SÜF came together in Tbilisi on 3-4 October 2023 to review opportunities to make a positive difference. Inspiration was derived from a variety of sources including the highlights of a conference held in Istanbul, Türkiye in 2022 on the theme '*Achieving health through diet*', ⁽¹⁾ and examples of best practice from the UK and Türkiye.

Eka Bobokhidze and Manana Stanley provided an overview of the health and nutrition status of the Georgian population and highlighted opportunities for improvement.

According to the Global Health Observatory data repository, in 2023 average life expectancy and healthy life expectancy of Georgians were 73.3 and 64.2 years respectively⁽²⁾. Hence almost a decade of the latter years is spent with one or more chronic diseases. Prevalence of diabetes was estimated to be 6.8% in 2021 by the IDF⁽³⁾.

The top 5 leading causes of death in 2019 were ischemic heart disease (400.69 deaths per 100,000 population), stroke (299.47), hypertensive heart disease (109.77), cirrhosis of the liver (46.82) and Alzheimer diseases and other dementias (45.7)⁽⁴⁾.

The top 5 leading causes of DALYs in Georgia for both sexes were ischemic heart disease (6982.06 DALYs per 100,000 population), stroke (5429.25 DALYs), diabetes mellitus (1787.08 DALYs), hypertensive heart disease (1603 DALYs) and cirrhosis of the liver (1420.35 DALYs)⁽⁵⁾.

According to the most recent statistical yearbook from the National Center for Disease Control and Public Health, in Georgia between 2000 and 2018 there was an increasing trend of circulatory system diseases among the population. However, in 2019 there appeared to be a shift in this trend and the recorded incidence rate for these diseases decreased sharply from

277.0 per 100,000 in 2018 to 92.1 in 2019⁽⁶⁾. This observation could be due to a change in the method of disease registration, and clarification is needed.

The Western diet has a significant influence on Georgia's current dietary pattern, reshaping traditional eating habits and introducing a variety of processed foods and convenience-oriented choices. With the increasing availability of fast food chains, sugary beverages, and pre-packaged snacks, Georgian cuisine has witnessed a shift towards a more Westernized pattern. This transition has been marked by an increased consumption of refined sugars, saturated fats, and processed meats, contributing to a rise in health concerns such as obesity and related diseases. The cultural exchange facilitated by globalization has not only altered the nutritional landscape but has also demonstrated a need for increased awareness about the potential health repercussions associated with adopting a Westernized diet.

Surveillance of non-communicable diseases risk-factors showed that majority of the adult population (92.4%) have one or more risk factors associated with developing NCDs⁽⁷⁾. More than a third of the population (36.1%) have 3 to 5 risk factors⁽⁷⁾. Diet-related risk factors included in this study were low consumption of fruits and vegetables, high consumption of salt and being overweight.

Georgia is currently missing national food intake data and this hinders decision-making processes in planning and implementing public health policies. The following assessment of the nation's nutritional status is a summary from various international sources that are based on modelling and may not reflect the reality.

The health status among infants and children under 5 years old has shown significant improvement during last couple of decades. Between 2005 and 2018 rates for overweight, wasting and stunting have decreased from 20.8%, 3.0% and 14.6% to 6%, 0.6% and 5.8% respectively⁽⁸⁾. Conversely, the prevalence of overweight and obesity among older children (>5 years) and adolescents is increasing. Since 2000 the prevalence of excess weight among children and adolescents has increased from 12% and 14% to 22.9% and 20.2% for boys and girls respectively⁽⁹⁾. The prevalence of overweight and obesity among the adult population shows alarming rates with more than half of the population estimated to be overweight or obese (56.8% male; 55.4% female)⁽¹⁰⁾. Information about malnutrition is not available.

Nutrition research is at an early stage of development in Georgia. Hence, the opportunity exists to implement best practices from around the world.

Many Georgian health professionals and academics, in particular from the younger generation, are very keen to contribute to developing nutrition and nutrition science in Georgia.

The wide variety of foods, eating habits and lifestyles in Georgia deserve investigation with the collaboration of our international partners with a view to highlighting best practice, and hopefully reducing disease risk and maintaining good health.

John Mathers introduced the global challenges for nutrition and health including the adverse effects of both under-and over-nutrition and the importance of considering the wider environment when developing interventions.

In a typical year, poor diet is responsible on a worldwide basis for 11 million deaths and significant morbidity, equivalent to over 250 million DALYs⁽¹¹⁾. This diet-related burden of ill-health is shared by those in higher and in lower income countries. Although the focus has shifted recently towards diseases associated with over-nutrition, under-nutrition remains a significant public health issue. For example, a recent survey of 11 different countries with different levels of economic development showed that deficiency of micronutrients was common in both non-pregnant women of child bearing age and in pre-school children⁽¹²⁾ and affected a majority of individuals in several countries. There is a close relationship between nutrition and immune function and good understanding of some of the mechanisms through which under-nutrition impairs immune function⁽¹³⁾. When combined with poverty that increases exposure to infections, under-nutrition leads to more severe/ prolonged infections and greater mortality⁽¹⁴⁾.

For the past 3-4 decades, the prevalence of obesity has been increasing globally with particularly rapid increases in countries including China⁽¹⁵⁾ and India⁽¹⁶⁾ that have been undergoing rapid economic development. Importantly, this rise in adiposity has occurred in both urban and rural areas in both adults⁽¹⁶⁾ and children⁽¹⁷⁾. Obesity is a driver of common NCDs including cardiovascular diseases, type 2 diabetes, fatty liver disease, age-related dementia and multiple cancers. NCDs are major causes of morbidity and mortality globally and e.g. 6.7 million deaths were due to type 2 diabetes in 2021⁽¹⁸⁾. In the absence of effective interventions, it is predicted that 1.27 billion people will be living with type 2 diabetes in 2050⁽¹⁹⁾.

There are well-established healthy eating guidelines to reduce NCD risk⁽²⁰⁾ but the continuing rise in obesity prevalence cautions against reliance on individual level actions to improve dietary choices. The global obesogenic environment is complex and is shaped by commercial actors that have major influences on food availability and food choice. For example, westernisation of the Chinese diet, including more meat and industrially-prepared foods, has been linked with adverse effects on public health⁽²¹⁾. There is an urgent need for greater understanding of the commercial determinants of health⁽²²⁾ and use of this understanding to develop effective interventions nationally, and globally, to improve dietary choices and to improve health at all stages of the life course.

Diána Bánáti provided an overview of the obesity epidemic in Europe. Obesity is a complex multifactorial disease. Abnormal or excessive accumulation of fat is a serious public health challenge globally, being a major determinant of disability and death. Overweight and obesity are the 4th most common risk factors for NCDs after high blood pressure, dietary risks and tobacco. The burden of NCDs has increased continuously over recent years worldwide. In Europe NCDs caused 90% of deaths in 2021 and 85% of YLDs⁽²³⁾. Numerous medical conditions are associated with obesity including cardiovascular diseases, diabetes mellitus, musculoskeletal complications, chronic respiratory diseases and mental health problems. Excess body weight increases the risk of 13 types of cancer⁽²⁴⁾.

More than 50% of adults in 50 out of 53 Member States in the WHO European Region live with overweight or obesity. Nearly one third of children (29% of boys and 27% of girls) are also affected⁽²⁴⁾.

The highest levels of overweight (including obesity) in Europe are found in Mediterranean and eastern countries. The highest rate is in Türkiye where more than 60% of both sexes are affected, followed by Malta, Israel, UK, Andorra, Greece, Czechia, Bulgaria, Spain, Hungary and Ireland. The highest levels of obesity are also found in Mediterranean and eastern countries. More than 25% of both sexes are obese in Türkiye, followed by Malta, UK, Hungary, Lithuania, Israel, Czechia, Andorra, Ireland, Bulgaria and Greece⁽²⁴⁾. Obesity in Europe has risen by 138% since 1975.

Unhealthy body weight in early life can affect the risk of obesity later in life⁽²⁴⁾. Obesity is linked to greater morbidity and mortality from COVID-19^(25,26). Increases in the consumption of foods high in fat, sugar and salt have been observed during the pandemic^(27,28,29).

Obesogenic (digital) food environments increase the likelihood of overconsumption of energy-dense, nutrient-poor foods.

Several policy frameworks and action plans have been designed to halt the rise in obesity in Europe^(30,31,32,33) However, public health systems are still failing to slow the increase in risk factors. The WHO European Programme of Work⁽³⁰⁾ calls for united action for better health. The three core priorities are: 1) moving towards universal health coverage, 2) protecting people better against health emergencies, and 3) promoting health and well-being. One of the flagship initiatives focuses on healthier behaviours, including how to incorporate behavioural and cultural insights. With this, WHO/Europe intends to invest in new insights that can help to build a culture of health in which everyone is enabled to make healthy choices. The initiative will promote the use of insights into social, behavioural and cultural factors to improve health literacy.

In 2014, the WHO launched its healthy diet guidelines and FAO-WHO documented the concept of healthy diets⁽³⁴⁾. Poor diet is a leading risk factor for development of NCDs and premature mortality. Poor diets impede healthy growth, development, and affect many body functions. Over 8 million lives every year could be saved by the adoption of a healthy diet. There is a great diversity of healthy dietary patterns, reflecting different cultures, traditions, preferences and practices, all sharing the key characteristic of supporting the highest level of health and well-being. FAO and WHO are updating their concept of healthy diets to reflect the latest scientific evidence for the relationship between diet and human health, but also recognize the intricate linkages between human and planetary health through sustainable agrifood systems⁽³⁵⁾.

In its latest report on The State of Food Security and Nutrition in the World 2023⁽³⁶⁾, FAO also discusses healthy diets in the light of urbanisation and food system transformation. In an urbanizing world, technology and innovation are key enablers for agrifood systems transformation.

Oliver Shannon discussed the impact of a Mediterranean-like diet on cognitive function and dementia risk, and the potential to adopt this healthy dietary pattern in non-Mediterranean settings such as the UK.

Dementia is a leading cause of morbidity and mortality, with considerable social and economic costs⁽³⁷⁾. Whilst promising pharmacological treatment options for Alzheimer's disease – the most common cause of dementia – are beginning to emerge^(38,39), these drugs

are expensive, have potentially severe side effects, and may not be accessible to all⁽⁴⁰⁾. Consequently, the identification and implementation of feasible, acceptable and effective strategies to prevent dementia remains a priority.

Modification of diet represents a potential strategy to help maintain better cognitive function into later life and to reduce dementia risk⁽⁴¹⁾. In particular, research suggests that adoption of a Mediterranean-like diet could lead to better cognition and lower dementia incidence in older adults⁽⁴²⁾. Hallmark features of the Mediterranean diet include: high intake of plant-based foods, abundant use of olive oil, moderate intake of fish and wine, and low intake of red/processed meat and sugar-rich drinks, cakes and pastries⁽⁴³⁾.

Whilst much of the data supporting adoption of a Mediterranean-like diet comes from studies conducted in the Mediterranean basin⁽⁴²⁾, evidence from two recent large-scale observational studies^(44,45) suggests similar beneficial associations may also be apparent in the UK. Firstly, in an analysis of >8000 older adults from the EPIC-Norfolk cohort, higher adherence to the Mediterranean diet was associated with better global cognition, verbal episodic memory and simple processing speed⁽⁴⁴⁾. Secondly, in an analysis of >60,000 older adults from the UK Biobank cohort, individuals in the highest versus lowest tertile of adherence to the Mediterranean diet had a 23% lower risk of dementia⁽⁴⁵⁾. Promisingly, recent data from a small (n=104) randomised controlled trial⁽⁴⁶⁾ – the MedEx-UK study - shows that adoption of a Mediterranean-like diet for at least 6 months is feasible and acceptable in older adults in the UK, and improves both general cognition and memory⁽⁴⁷⁾. Therefore, consumption of a Mediterranean-like diet could represent a potential strategy to improve cognitive function/reduce dementia risk in older adults, and adoption of a Mediterranean-like diet in a UK setting appears to be both feasible and acceptable. Large-scale randomised controlled trials are now required to explore potential to adopt a Mediterranean-like diet for dementia risk reduction on a population scale.

Julian Stowell provided an overview of the health and nutrition status of the Turkish and UK populations, highlighting a selection of initiatives designed to improve the situation.

Average life expectancy is 78 years in Türkiye and 81 years in the UK. However, average *healthy* life expectancy is just 68.4 years in Türkiye and 70.1 years in the UK and chronic disorders and disease are common in later life^(48,1). Main causes of death are cardiovascular disease and cancers⁽⁴⁹⁾ and cases of dementia are increasing⁽⁴⁹⁾. Some 66.8% of the adult Turkish

population and 64% of the UK population are overweight or obese^(50,51). In 2021 age adjusted diabetes prevalence was 14.5% in Türkiye and 6.3% in the UK⁽⁵²⁾.

In both Türkiye and the UK salt intake, saturated fat consumption and energy intake are excessive. Micronutrient deficiencies persist including iron, vitamin D and iodine (27.8% of the Turkish population). Fruit, vegetable and dietary fibre intakes are suboptimal⁽¹⁾. In Türkiye, a National Obesity Action Plan encompasses food standards for school children, increased physical activity, updated National Dietary Guidelines and many initiatives to raise awareness about lifestyle-related diseases⁽⁵³⁾. The Turkish and World Diabetes Foundations have together implemented a diabetes education programme with promising results⁽⁵³⁾. A healthy eating and obesity prevention programme in Istanbul includes the provision of 35,000 bicycles and publicly available sports trainers⁽¹⁾. The Sabri Ülker Foundation has championed nutrition education in schools.

Average life expectancy in Türkiye has increased from 41 years in 1950 to 75 years in 2015, an impressive improvement⁽⁵⁴⁾.

In the UK the *Eatwell Guide* offers a clear depiction of food-based dietary guidelines⁽⁵⁵⁾. A recent English Government plan to tackle obesity includes restrictions on less healthy foods, wider calorie labelling and investment in school sports⁽⁵⁶⁾. A soft drinks industry levy, implemented in 2018, has resulted in a 35% reduction in sugar sold via soft drinks but, overall per capita consumption has remained constant⁽⁵⁷⁾. On a positive note, the Diabetes Remission Clinical Trial (DiRECT) reported a 46% remission of T2DM following a 12 week energy restricted diet, sustained after 5 years when weight loss was maintained⁽⁵⁸⁾.

In conclusion, Life expectancy has increased over the last 75 years in both Türkiye and the UK. However, healthy life expectancy is at best static and there is much still to be done to reduce the burden of NCDs in later life. Interventions are more likely to be successful if they adopt a multistakeholder approach.

Avril Aslett-Bentley provided an overview of the role of PH Nutritionists and Dietitians in the UK where there are clear paths for obtaining accredited qualifications and registration with well-developed support structures in place. It is envisaged that aspects of the UK system could be established elsewhere in order to address diet-related Public Health issues.

The ANS⁽⁵⁹⁾ was founded in the UK in 2019 as a joint initiative between the AfN⁽⁶⁰⁾, the BDA⁽⁶¹⁾, the BNF⁽⁶²⁾ and The NS⁽⁶³⁾. ANS works to improve public health and wellbeing by

supporting excellence in research, education and associated activities to advance the knowledge and application of evidence-based nutrition science. Since its inception ANS has produced position papers on Evidence for Dietary Recommendations and Evidence for Health Claims with a paper on Evidence for Nutrition Interventions for Individuals due later in 2023.

The BDA lists the universities in the UK offering a wide range of pre-registration degree courses in dietetics⁽⁶⁴⁾.

UK registrars and regulators of professional standards and conduct for PH Nutritionists and Dietitians respectively are:

- The UKVRN, held by the AfN. New registration competencies, and standards and degree accreditation will apply to all AfN registrants and degrees by April 2024. Currently there are c.2,500 registrants, including approved PH Specialists i.e. RNutr (Public Health)⁽⁶⁵⁾, and
- The HCPC, conferring statutory (generic RD) Dietetic registration, with protection of title and currently with c.11,000 registrants. PH Dietitians are specialists, but PH is embedded across Dietetic Practice⁽⁶⁶⁾.

The various groups representing Nutritionists and Dietitians in the UK offer a wide range of supporting materials, many of which are freely available to all via their individual websites.

For example, the PHSG, one of 22 BDA specialisms, spans the lifespan addressing Non Communicable Diseases, Vulnerable Groups and Food Insecurity and embeds dietary sustainability^(67,68). The AfN also has some useful PH resources⁽⁶⁹⁾. Regulation of both Nutritionists and Dietitians is based on Evidence Based Practice, as promoted by the ANS and featured in the AfN's comparative summary which distinguishes between UK Registered Nutritionists, Dietitians, Associate Nutritionists and Nutritional Therapists⁽⁷⁰⁾.

The BDA also offers a series of Food Fact Sheets that have been prepared by Dietitians to highlight best practice. The most popular PH focused ones cover Folic Acid, and Menopause and Diet⁽⁷¹⁾. The Royal Society for Public Health (RSPH) launched a 5 year strategic plan in 2022 with the goal of facilitating all members of the population to lead healthier and more equal lives for longer⁽⁷²⁾. The role of Dietitians in Public Health is clearly summarised in a new infographic developed by the UK Government Office of Health Improvement and Disparities and RSPH, with a personal contribution from the BDA PHSG. The key headings are: Health Protection, Population Healthcare, Wider Determinants and Health Improvement⁽⁷³⁾.

The AfN provides career and job information for Registered Nutritionists, including for PH specialists⁽⁷⁴⁾.

Overall, the work of PH Nutritionists and Dietitians supported by best use of resources has the potential to improve dietary habits and to create a healthier society.

F. Nur Baran Aksakal presented a summary of the programme of nutrition education for family physicians implemented in Türkiye in 2022 with follow-up ongoing.

As elsewhere, family physicians in Türkiye are generally lacking in nutrition knowledge⁽⁷⁵⁻⁸⁶⁾. This is, perhaps, to be expected as the curriculum of medical students and other healthcare professionals is already highly intensive, and nutrition education is typically not a formal part of it. However, it is important that the potential of balanced nutrition to reduce disease risk and contribute to the maintenance of good health is understood by those who have the potential to make a positive difference. With this in mind, in 2022 the SÜF teamed up with the Turkish Federation of Family Physicians Associations to implement a programme of nutrition education for family physicians.

As a first step an online survey was conducted to identify areas where family physicians most feel the lack of knowledge. Based on the feedback of 1,300 respondents, Professor Serhat Ünal of Hacettepe University and Professor F Nur Baran Aksakal of Gazi University took the lead in developing a programme together with an expert group consisting of nutritionists, dietitians and family physicians. This has now been the subject of eight online lectures and interactive sessions of two hours. The following subjects have been covered by experts in the various topics:

- What is included in nutrition? How is it defined?
- What are prebiotics and probiotics? What is their role?
- How can vitamin and mineral levels be monitored? How can deficiencies be identified and rectified?
- Calories versus nutrients. The distinction and its implications
- Nutrient: Medicines interactions and their significance in the clinical setting
- What role do food supplements play in health and wellbeing?
- A review of popular diets
- Achieving a healthy lifestyle

The target audience was over 26,000 family physicians, all of whom were invited online. Some 8,900 have now taken the course. More than 200 questions were raised by the participants and initial feedback has been consistently excellent. However, measuring the long term impact of this programme provides a difficult challenge. The next step is planned to include more family physicians together with specialist physicians, starting with internal medicine and paediatrics.

A lively workshop following the conference in Tbilisi fully endorsed this programme of nutrition education and it is hoped that it might serve as an inspiration for others.

Caroline Saunders presented examples of how the Food Industry contributes to consumers' quest for an optimum diet and lifestyle. Many initiatives are active under the auspices of trade associations and relevant charities such as the BNF, the focus being to improve the health of consumers. For example, a large number of food companies have supported the BNF's healthy eating week, an annual celebration aimed at encouraging the nation to eat and drink more healthily as well as getting more active⁽⁸⁷⁾. Over 20 food and drink companies also pledged their support to increase the amount of fibre in consumers' diets after backing the Action on Fibre initiative launched by the Food and Drink Federation in the UK⁽⁸⁸⁾. This has been an important initiative as only 9% of UK adults currently meet the recommended intake. Dietitians working in the food industry also support many initiatives such as the BDA Fact Sheet on how to 'Eat well, Spend less'⁽⁸⁹⁾.

In addition, many companies have their own programmes and approaches to improving the healthfulness of their existing products and future innovations. These approaches are typically either based on reducing nutrients to limit intake (such as energy, saturated fat, added sugars, and/or sodium) or enhancing nutrients to encourage increased intake (including fibre, protein, fruits, vegetables, legumes, and/or nuts). Examples of these approaches include:

- Reducing nutrients to limit intake
- Silent reduction through gradual reduction of sugar, sodium and/or saturated fat reduction through the use of healthier oils
- Portion control
- Greater than 30% reduction using new technologies such as sugar reduction through replacement with fibres
- Approaches to increasing nutrients to encourage higher intake

- Replacing nutrients on the list to be limited with nutrients to be encouraged, such as sugar replacement with fibre
- Using more nutrient dense ingredients such as protein rich pulse flours to replace wheat flour

It is also common for food companies to partner with universities to advance their technical solutions or through collaborations such as that with the Biotechnology and Biological Sciences Research Council, a major funder of world leading bio-science in the UK⁽⁹⁰⁾.

Begüm Mutuş, Özge Dinç and Özlem Üliç Çatar provided an overview of a programme of nutrition education implemented in Turkish schools since 2011 and, as background, summarised recent research to determine the level of health literacy in Türkiye. In addition to the urgent public health issue of obesity referred to above, a Türkiye Demographic and Health Survey highlighted that 10% of Turkish children under five years old were stunted, and 2% exhibited wasting⁽⁹¹⁾.

A recent review highlights the importance of optimum nutrition in childhood and adolescence on long-term health including cognitive function and the prevalence of nutrition-related diseases⁽⁹²⁾.

The Balanced Nutrition Education Programme was initially developed by the SÜF in collaboration with the BNF and Hacettepe University. It has, since 2011, been implemented in schools in cooperation with the Republic of Türkiye Ministry of National Education, Directorate General for Basic Education. It is currently active in 22 provinces throughout Türkiye and has now reached an estimated 7 million students, parents and teachers with educational and entertaining materials. The primary goal is to emphasize the importance of balanced healthy eating combined with physical activity.

A team of trainers provides essential input to teachers in each province and the programme is then rolled out in individual schools. It runs for 38 weeks with two hours of input per week. Also included is a ten minute exercise routine before classes begin. Children from pre-kindergarten to sixth grade are now included. The curriculum is constantly being upgraded based on feedback and new ideas. In an evaluation of the impact of the programme SÜF worked with the universities of Ege, Erciyes and Marmara to evaluate 618 primary school

participants in the programme. The results were encouraging in that, following intervention, students' total energy intakes decreased, physical activity levels increased, age-based BMI dropped in the case of female students and the frequency of obesity decreased for both male and female students⁽⁹³⁾.

Health literacy is an essential factor in ensuring that health and nutrition information is understood and utilised effectively. The proliferation of misinformation necessitates accessible, evidence-based resources to enhance individual health literacy. In Türkiye, 35 million out of 53 million adults lack sufficient knowledge in health literacy, which inversely correlates with disease rates. According to the Turkish Health Literacy Level and Related Factors research, 24.5 percent of the adult population in Türkiye has inadequate knowledge and 40.1 percent has a problematic level of knowledge about health literacy. Unfortunately, as the level of knowledge decreases, the rate of disease increases. 22.6 percent of those with problematic health literacy, 19.7 percent of those with adequate health literacy, and 13.5 percent of those with excellent health literacy have a diagnosed disease⁽⁹⁴⁾.

The Balanced Nutrition Education programme has been held up as an example of best practice and it is hoped that it will inspire others to implement similar programmes where nutrition education in schools is lacking.

Rusudan Gvamichava and Ihab Tewfik provided an overview of the Georgian parents' nutrition education programme, highlighting the issue of malnutrition in children.

The problem of insufficient and imbalanced nutrition, and particularly malnutrition, is widely recognized as a significant challenge to children's development at a global level^(96,97,98). Malnutrition in children has been linked to poor mental health and academic performance as well as behaviours which increase the risk of several chronic diseases in later life^(99,100).

According to the WHO, around 45% of deaths among children under 5 years are linked to undernutrition⁽¹⁰¹⁾. Currently there are no professional nutrition guidelines for children and parents in Georgia⁽¹⁰²⁾. According to studies conducted in Georgia in 2018, schoolchildren experience serious problems of malnutrition with 35% at grade 4 feeling hungry at school^(96,103). As noted previously, the incidence of overweight and obesity is also high. A nationwide survey of year 7 children found 22% of girls and 26% of boys were overweight

or obese⁽¹⁰⁴⁾. Thus, in Georgia studies have highlighted the coexistence of obesity and undernutrition, exemplifying a double burden of diseases⁽¹⁰⁵⁾.

A recent study undertaken under the auspices of the University of Westminster sought to assess the efficacy of family-based nutrition interventions to address childhood malnutrition in Georgia. This study represents the first attempt in Georgia to use a family-based approach to promoting healthy eating via science based nutrition education for parents. A total of 328 parents of schoolchildren, recruited from the capital city, Tbilisi, participated in the intervention. This sample, which included children from both the private and public sector schools, was considered to be representative of the city as a whole. Parents completed two online questionnaires both before and after intervention: Knowledge, Attitude and Practice and a semi-qualitative Food Frequency Questionnaire. The duration of the intervention was ten weeks and it included a series of nutrition education webinars.

Preliminary, as yet unpublished, results demonstrated a decrease in BMI-for-age following intervention, giving a reduction in the numbers of overweight and obese children. Numbers eating a regular breakfast significantly increased as did the parents' awareness about nutrient deficiencies. The nutrition education webinars enabled parents to become acquainted with relevant information and, as a result, they started to make healthier food choices for their children. Previous studies have shown a positive correlation between the use of educational webinars and increased nutritional awareness and improved health habits and diet^(106, 107).

All activities within the framework of the current research have been focused on the goal of supporting sustainable, long-term improvement of children's health in Georgia.

Concluding remarks

This event in Tbilisi attracted a lively participation with a full conference room and additional delegates joining online. A wide cross-section of participants included Government officials, academic scientists, healthcare professionals, medical students, media representatives and food industry specialists among others. Most were from Georgia which was very encouraging as clearly the motivation exists to improve nutrition and public health in Georgia. A compelling overview was provided on the current global crisis in nutrition and public health, with poor diet estimated to be responsible for 11 million premature deaths annually. Delegates learnt about the current status in Georgia including the prevalence of lifestyle related diseases and disorders. The lack of formal nutrition and dietetics training was highlighted as was the absence of food intake data. Neighbouring Türkiye, faced with similar

challenges, has responded with an impressive programme of initiatives including nutrition education for healthcare professionals and school children, incentives to increase physical activity and Government legislation and programmes to encourage best practice among consumers. All these have contributed to a dramatic increase in life expectancy over the last 70 years. In the UK the Government has championed sugar and salt reduction and throughout Europe the emphasis has been on reducing the incidence of overweight and obesity, so far without perceptible success. The potential to reverse type 2 diabetes has been clearly demonstrated and a Mediterranean style of diet has been shown to be associated with better cognitive function in later life. But there is still much to be done to improve the prognosis for long term good health. Georgia has both the motivation and the wherewithal to make a positive difference. This conference and workshops provided a platform for all stakeholders to share knowledge and consider opportunities for improving public health for the benefit of all. It is hoped that it will also inspire other countries and regions to take up the challenge.

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