BMC Nutrition

EDITORIAL Open Access

BMC Nutrition: the voice of nutrition within the BMC series

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Abstract

This editorial accompanies the launch of *BMC Nutrition*, a new open access, peer-reviewed journal within the *BMC* series portfolio that considers articles on all aspects of nutritional sciences. *BMC Nutrition* will help increase and disseminate knowledge in the nutrition field, share the most important developments, trends, and practices in this growing area and promote desirable food behaviour and nutritional practices.

Introduction

'Let thy food be thy medicine and thy medicine be thy food' [1]. Around 2,500 years ago Hippocrates, the father of Western medicine, first proposed the 'food as medicine' philosophy, which fell into obscurity by the 19th century. Is that about to change? A growing interest in the nutritional science is opening up many therapeutic possibilities, and nowadays, concern about malnutrition is at the top of political agendas [2].

Good nutrition is a human right. The importance of food and nutrition in human development is widely recognized in both high-income and middle- to low-income countries. Nutritional problems broadly fall into two main categories: those resulting from insufficient intake relative to nutritional needs and those resulting from excessive and unbalanced intake of food or a particular dietary component.

The World Health Organization recognized the need for recommendations to help reduce the burden of nutrition-related chronic diseases, including obesity, diabetes, cardiovascular disease, several forms of cancer, osteoporosis and dental disease. To achieve the best results in preventing these diseases, strategies and policies should fully recognize the essential role of both diet and physical activity in determining good nutrition and optimal health. 'Policies and programmes must address the need for change at the individual level as well as the modifications in society and the environment to make healthier choices accessible and preferable' [3].

The Prague Declaration [4], signed in 2009 by representatives of the Ministries of Health of the European Union member states, the Czech presidency of the EU, medical experts, representatives of national health services and health insurance groups, the European Society of Parenteral and Enteral Nutrition and the European Nutritional Health Alliance unanimously concluded that malnutrition, including disease-related malnutrition, is an urgent public health and health-care problem. Malnutrition is a state in which a deficiency, excess or imbalance of energy, protein and other nutrients causes measurable adverse effects on the tissue/body form (body shape, size and composition), function or clinical outcome [5]. This is inevitably accompanied by increased vulnerability to illness, increased clinical complications and even death. However, these risks can be significantly reduced if malnutrition is recognized early and specifically treated with relatively simple measures. Of course, diet plays an essential preventive role. Concrete actions need to be taken to prevent malnutrition continuing to compromise the quality of life, to cause unnecessary morbidity and mortality and to undermine the effectiveness of health-care systems.

The *BMC* series wants to contribute to helping the community better understand the importance of good nutritional care, providing information on the relationship between diet and health, the nutritional needs of the population and of individuals, the importance of ensuring the quality and safety of the food supply, the causes and consequences of nutritional disorders and the benefits of food labelling and legislation.

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BMC Nutrition will serve as a resource for all professionals and authors with an interest in nutrition, who can find here the best home to publish their work in and discuss and share the most important developments, trends and practices in this growing area.

Aims and scope

BMC Nutrition considers articles on all aspects of nutritional sciences, including public health nutrition and global interventions, nutritional epidemiology, the biological underpinnings of nutrition in the body, clinical nutrition, health and nutrition throughout the life course and dietary supplementation for improvement in health and performance. The journal also welcomes papers on developments in nutritional research tools and novel technologies. *BMC Nutrition* is part of the *BMC* series, which publishes subject-specific journals focused on the needs of individual research communities across all areas of biology and medicine. We offer an efficient, fair and friendly peer review service and are committed to publishing all sound science, provided that there is some advance in knowledge presented by the work.

BMC Nutrition has five editorial sections:

Basic science
Clinical nutrition
Life stage nutrition
Nutritional interventions, policies and public health
Sports nutrition and dietary supplementation

We are delighted to welcome Maria Lorella Gianni', Truls Raastad, Denis Roy, Ursula Schwab and Joseph Sharkey as Section Editors for the journal, along with an expanding international team of Associate Editors [6].

In order to ensure the transparency and fairness of the review process and to give credit to reviewers for their efforts, *BMC Nutrition*, like all the medical journals in the *BMC* series, will operate an open peer review system. Open peer review means that the identity of the peer reviewers is disclosed and their names are included on the peer review reports, so that authors can see who has reviewed their manuscript. Once the article has been published, the reports are made available online along with the final version of the manuscript. The published article will provide a link to its 'pre-publication history', which lists all the versions of the manuscript, all the signed reviews and all responses to the reviewers from the submission of the manuscript to its publication.

BMC Nutrition aims to publish work deemed by peer reviewers to be a coherent and sound addition to scientific knowledge and to provide an all-important open access platform to allow the effective dissemination of this knowledge, so that we can all work together to understand more fully and explore the most important developments, trends and practices in nutrition. We believe that open access and the Creative Commons Attribution License [7] is essential in this, allowing universal and free access to all articles published in the journal and allowing them to be read and the data re-used without any restrictions. *BMC Nutrition* will work closely with the rest of the journals in the *BMC* series portfolio [8] to help authors find the right home for their research in the nutrition field.

Basic science section, Section Editor: Denis Roy

Scientists from all disciplines are studying the impacts of food and diet on health maintenance and disease development. Emerging sciences and new related technologies play a key role in developing a better understanding of nutrition in healthy growth, development, and reproduction and individual variability in metabolic responses to nutrients and dietary patterns. In 2014, the US Academy of Nutrition and Dietetics stated that nutritional genomics that includes nutrigenetics, nutrigenomics and nutritional epigenomics provides insight into how diet and genotype interactions affect the phenotype [9]. Nutritional systems biology that assembles information from genomics, transcriptomics, proteomics and metabolomics allows the interactions between nutrients, host metabolism and microbiome (interactome) to be studied. With next-generation sequencing, nutritional researchers can profile the entire microbial communities in order to determine the role of human microbiome in the etiology of diseases and disorders and the effect of dietary components such as prebiotics and probiotics on the modulation of intestinal microbiota and their potential to enhance health or reducing risk of disease.

This section considers studies on all aspects of the underlying biological basis of nutrition including nutrigenomics, proteomics, metabolomics, epigenetics, oxidative stress, nutrient physiology and biochemistry, the microbiome, probiotics, prebiotics and hormone-nutrient interactions in the cell and the central nervous system. It is our hope that *BMC Nutrition* will contribute to progress in nutrition research by the publication of discoveries and applications and promotion of the field of nutrition science through science-based information.

Clinical nutrition section, Section Editor: Ursula Schwab

Nutrition is an important part of therapy in several diseases and conditions such as coronary heart disease, insulin resistance, diabetes and obesity and in the treatment of elevated levels of risk factors, for example, dyslipidemia and elevated fasting blood glucose concentration. Sometimes nutrition therapy is the only form of effective therapy, as, for example, in coeliac disease.

Despite the large amount of scientific data, there is still a lot of information needed for optimizing nutrition therapy. One important area of investigation is the effects of genes. There are increasing data showing that genetic background modifies the effects of nutrition therapy: some people benefit more and others less from certain dietary modifications. Further research is required to determine how many nutritional therapies may be affected by genetic background and how to address the different responses in those individuals who do not benefit from dietary modifications.

Another aspect of clinical nutrition is the issue of malnutrition in hospitalized patients, which is common even in affluent countries. There is still a lot to do in recognizing malnutrition and the risk of it both in hospitalized patients and in outpatients. Malnutrition causes several problems and results in longer stays in hospital and increased mortality and also significantly increases the costs of health care. It is very important to minimize the prevalence of malnutrition in patients and develop operations models in health care to treat malnutrition efficiently before the onset of serious and costly consequences of it.

Taken together, by optimizing nutrition, it is possible to prevent common diseases, treat them efficiently and promote efficient care and recovery in hospitalized patients. The Clinical nutrition section of *BMC Nutrition* welcomes papers dealing with these issues aiming at increasing knowledge and optimization of prevention and treatment of diseases and taking the individual differences in responses to nutrition therapy into account, if possible. The section also warmly welcomes papers dealing with tackling malnutrition and optimization of care in patients.

Life stage nutrition section, Section Editor: Maria Lorella Gianni'

During the last decades, epidemiological, clinical and experimental research has provided increasing evidence on the crucial interrelation between early nutrition and subsequent health. It would be thrilling to think that we have fully elucidated the mechanism underlying this relationship, but our understanding of how nutrients interact with growth and developmental changes is still challenging. We have learnt that the first 1,000 days of life represent a critical time window for early programming of long-term health and supporting the optimal development of organs and their function. The concept that genes are set in stone or that they alone control development has been contradicted. Innovative research indicates that epigenetic processes represent the link modulating the interaction between genes and the environment and affecting how the phenotype comes into being. It has become clear that, of the environmental factors, nutrients play a key role in inducing epigenetic changes and, therefore, exerting later effects on health. Yet, we have still so much to understand about the relative contribution of specific nutrients in shaping the epigenome.

We encourage submission of research that focuses the attention on the molecular pathways involved in the modulation of the epigenetic status. The availability of basic science discoveries will support the transition into clinical research to allow for further development of this area. These studies may shed new light on potential new strategies in early life to reduce the exposure to environments that can negatively affect the epigenome. Furthermore, it is yet to be established whether interventions can reverse the adverse modifications of gene expression.

The Life stage nutrition section in *BMC Nutrition* aims to create an accessible platform for disseminating new knowledge and high-quality studies among researchers, practitioners and policy makers. It is our ambition to contribute in identifying novel strategies for promoting adequate nutrition in childhood helping children to reach their full potential of growth and to be healthy members of society.

Nutritional interventions, policies and public health nutrition section, Section Editor: Joseph Sharkey

In January 2000, the Department of Health and Human Services launched Healthy People 2010, a comprehensive, nationwide health promotion and disease prevention agenda, containing 467 objectives designed to serve as a framework for improving the health of all people in the United States during the first decade of the 21st century. The goals have been updated for Healthy People 2020, and two of its goals are to 1) create social and physical environments that promote good health for all and 2) promote health and reduce chronic disease risk through the consumption of healthful diets and maintenance of healthy body weight [10]. In order to accomplish these goals, researchers seek to 1) strengthen community capacity by engaging and expanding coalitions and infrastructure; 2) implement, evaluate and disseminate culturally and linguistically tailored strategies to improve access to healthier foods and beverages; and 3) implement and evaluate population-wide policy, systems and environmental (PSE) improvements in economically deprived areas throughout the world. Although some progress has been made in reducing nutrition-related health disparities among individuals living under adverse conditions, it is critical to help create healthier communities through community-based participatory approaches. These should be designed to reduce the incidence of nutrition-related health conditions, such as overweight and obesity, type 2 diabetes and cardiovascular disease among youth and

adults through policy, system and environmental improvements to increase access to and consumption of affordable healthier foods and beverages.

Youth and adults simultaneously face challenges of food insecurity, material hardship and limited geographic access to healthier foods and beverages. Altering the environmental factors that influence food choices and health is critical to addressing the obesity problem. Among limited resource families, neighbourhood access may be a key factor. Food costs and convenience, especially in neighbourhoods without supermarkets, may negatively influence the quality and quantity of food available to eat, compelling an individual to choose foods that are more energy-dense and nutrient-poor.

This section of *BMC Nutrition* highlights research and outreach that addresses a number of critical areas that have been overlooked in the literature. First, nutritional interventions targeting low-income and low-education populations in functionally rural areas have been limited, even though adults and children in these areas have disproportionately high risk for overweight, obesity and less-healthy dietary habits. Second, few efforts have attempted a market-segment approach that recognizes higher-risk subpopulations, such as low acculturated and low education, and realizes that a single targeted program often fails to reach and meet the needs of subpopulations, such as immigrants for whom the 'usual' program does not apply. Subgroups provide important population characteristics that demand differing approaches. Third, there are few reports of innovative community-based strategies to alter policy, system and environmental factors at multiple levels of the social ecology. We plan for *BMC Nutrition* to be an international forum for all aspects of nutrition interventions and policy change to influence the health of populations.

Sports nutrition and dietary supplementation section, Section Editor: Truls Raastad

In parallel with the increasing demands put on elite athletes, a well-planned diet has become fundamental for success and sustained performance throughout a career. 'The foods that an athlete chooses can make the difference between success and failure. Although wise food choices will not make a champion out of the athlete who does not have the talent or motivation to succeed, an inadequate diet can prevent the talented athlete from making it to the top' [11].

The focus on athletes' diet and dietary supplements has increased tremendously in most sports during the last decade. For athletes, coaches and the nutrition professionals supporting athletes, it is of utmost importance that choices can be made based on well-documented effects. Although a significant amount of scientific work has been carried out within the field in the last decades, there is still a need to better address the specific requirements of groups of athletes. Furthermore, possible beneficial or detrimental effects of dietary supplements on performance and health are continuously evolving. As for most nutrients, the dose of the supplements, and in which context is given, will affect the final results. One example is the intake of antioxidants; a balanced diet with multiple sources of antioxidant-rich foods is probably essential for tolerating large training loads and supporting the health of the athletes, but supplementing with high doses of specific antioxidants has been shown to interfere with normal training adaptations [12,13]. A major concern with sport supplements is that the labelling does not always reflect the true content; sometimes, the active ingredient is absent or in lower levels than claimed, and in other cases, a supplement may contain illegal substances. In this section, the focus will be on the active substances and not on specific products. Consequently, an objective analysis of content is a prerequisite for all papers investigating the effects of nutritional supplements.

In the Sport nutrition and dietary supplementation section of *BMC Nutrition*, we welcome high-quality papers focusing on performance and health outcomes relevant for elite athletes as well as for the more recreationally active population. The aim of the section is to provide the best of current knowledge on the acute and chronic effects of sports nutrition and supplementation strategies on physical performance, metabolism and health.

Conclusion

The launch of *BMC Nutrition* has been undertaken to provide an authoritative, unbiased, editorially interpreted review of the world's current research progress in nutrition science. We welcome and encourage any sound research with a focus on this broad field, hoping that the element of interest as well as value to the reader will not be overlooked.

Competing interests

The authors declare that they have no competing interests.

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Received: 20 November 2014 Accepted: 20 November 2014
Published: 21 January 2015

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doi:10.1186/2055-0928-1-1
Cite this article as: Cornacchia *et al.*: *BMC Nutrition*: the voice of nutrition within the *BMC* series. *BMC Nutrition* 2015 **1**:1.