

Review Article

The rise of clinical nutrition science in North-East Asia

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Effective clinical nutrition practice depends on a sound knowledge of biomedical, societal and environmental science and the skills to diagnose, prevent and manage the health problems related to food patterns, energy equilibrium (mostly to do with physical activity) and nutrient metabolism. Its delivery needs to be accessible, equitable, affordable and sustainable. Ordinarily, this will require both local and widely distributed health services. In North-East (NE) Asia, these requisites are being met to an ever increasing extent. The roots of this progress are steeped in cultures which acknowledge the food-health connections and support education which pays regard to these connections. As elsewhere, however, the food and health systems, their safety and security are threatened by exploitative operatives. In China, a concerted effort was made in the mid-1980s to foster clinical nutrition in major hospitals throughout the country by programs directed at medical graduates, nursing and kitchen staff; dietetics has appeared much more recently. By contrast, Japan has had an extensive and well-trained dietetic workforce for much longer, alongside a vibrant basic nutrition science constituency in its universities and food-nutraceutical industry. South Korea and Taiwan have traversed a similar course to that in Japan. Now, all of these NE Asian economies have gathered rapid momentum in the publication of innovative approaches to public health and clinical nutrition which have the prospect of not only improving health outcomes, but also reducing the societal and financial burden of health care. This is particularly important in rapidly ageing societies, which they are. It is also a growing challenge where climate change threatens to engulf the lives and destinies of hundreds of millions of Asians on account of natural disasters, water and food insecurity.

Key Words: workforce, Evidence-based Nutrition (EBN), Clinical Nutrition Practice Guidelines (CNPG)

HISTORICAL CONSIDERATIONS

Northeast Asia (NE Asia), which now comprises mainland China, Taiwan, Japan with the Ryuku Islands, and the Koreas, has a long cultural history which links food and health, often merged with the concepts of medicine and health. The region has also achieved among the longest life expectancies in the world, notably in Okinawa (the Ryukus), Japan itself, Hong Kong and, in several villages in South-West and West China and in Taiwan, high proportions of centenarians. More accessible and equitable health care systems have developed in recent times, although more evidently in urban than rural settings.¹

A more highly educated population in the region, which includes many with graduate qualifications and research skills from advanced economies, has given impetus to research of all kinds, including that in public health and clinical medicine. Moreover, Clinical Nutrition has received increasing recognition as a discipline, albeit inter-disciplinary.^{2,3}

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alongside a vibrant basic nutrition science constituency in its universities and food-nutraceutical industry. South Korea and Taiwan have traversed a similar course to that in Japan. Now, all of these NE Asian economies have gathered rapid momentum in the publication of innovative approaches to public health and clinical nutrition which have the prospect of not only improving health outcomes, but also reducing the societal and financial burden of health care.

DRIVERS

The encouragement for the health care system to revitalise its commitment to food and health as a health advancement strategy has evolved largely on account of national and international food and nutrition policy. In the 1970s, the notion that most nutritional problems were ones of energy, macronutrient and micronutrient deficiencies gave way to an appreciation that dietary patterns

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which were narrow, oriented towards animal sources and energy dense were contributory to disease patterns characterised by macrovascular disease (atherosclerotic and hypertensive heart, cerebral, renal and peripheral vascular), obesity, diabetes, certain cancers, osteoporosis and arthritis, among others. The explanations were also found to reside in the need for food complexity by way of its structure and phytochemistry.⁸ Certain foods and beverages increasingly stood out as protective in the favourable patterns – these included legumes⁹⁻¹² and fish,¹³ and also salt,¹⁴ tea¹⁵⁻¹⁷ and coffee,¹⁸⁻²⁰ but mode of beverage consumption may be relevant.¹⁸ Altogether, these food-health relationships have been recognised in food-based dietary guidelines and their implementation through the UN System^{21,22} and by region.²³⁻²⁸

WORKFORCE

Although the daily practice of medical centre clinical nutrition is that of a team which includes the medical practitioner of various backgrounds and specialties (eg intensivist, surgeon, metabolic physician, nurse, pharmacist and dietitian), that in the community may be solo and devolved to a community health worker. Thus the knowledge, skill and resource requirements will differ and be role dependent. Often, community assessment and programs will be the most needed, in which case rapid assessment methods and instruments will be the most appropriate.

Increasingly, digital and internet -based means are available for the delivery of nutritionally-related health solutions.^{29,30} The work-force requirements are likely to be in flux as these shifts in practice take place. With an expanding population on-line in NE Asia, itself the cradle of much of the new technology, practice will change accordingly. Photographic food intake methodology and image -based behavioural management is taking its place in the region.²⁹

EVIDENCE-BASED NUTRITION (EBN)

The evidence required for clinical nutrition practice is of multiple kinds.^{31,32} Clinical nutrition trials have limited application when it comes to food and food patterns.³³ They are generally most useful where the effects of nutrients in nutrition support are evaluated, as in feeding trials, enteral and parenteral nutrition or in case studies.³⁴⁻⁴⁸ It is more appropriate to develop a portfolio of evidence than to subscribe to hierarchies of evidence where clinical nutrition trials head the hierarchical list. Cohort studies are a main stay of Clinical Nutrition evidence in drawing attention to food-health relationships and testing their plausibility. Most clinical nutrition journals publish meta-analyses of trials and epidemiological studies (cohort, nested, case-control), but these often suffer from overstating or understating the situation, discourage interest in the original studies and, often, are executed by people who are not in the field or are new to the field, lacking in the depth of understanding of the topic in question.

In the area of eating disorders and body image,^{49,50} the clinical nutrition approaches are intertwined with psychosocial considerations. Research findings in this field are demanding to compile and interpret.⁵¹⁻⁵⁴

Nutrigenomic studies are making their presence felt in the NE Asian Clinical Nutrition literature.⁵⁵⁻⁶⁰ They

sometimes demonstrate important practical differences between populations and individuals in diagnosis, prevention and management. It remains a moot point the extent to which they will be found in routine, affordable clinical nutrition practice – although cost and access usually improve with time, and perhaps this is more likely to be the case in NE Asia than elsewhere.

Notwithstanding the nutrigenomic approaches which are emerging, dietary patterns which are biodiverse offer improved health outcomes, even in the face of otherwise adverse health profiles, although limits need to be understood as those imposed by diabetes.^{6,7,61-64}

We are at the beginning of a wave of metabolomic and microbiomic studies in clinical nutrition which will make a profound difference to our understanding of food and health. At the same time, we are learning through such studies that all is not abnormal that we think. For example, so-called ‘lactose intolerance’, which characterises most of the world’s population, would be better referred to as ‘lactase non-persistence’. Symptoms are dose-related to a supra-physiological exposure to oral lactose (in a test product), rarely seen with fermented dairy products and where symptoms experienced in real life may be otherwise attributable.⁶⁵⁻⁷⁰ An unintended consequence of dairy exclusion may be to deny this stimulus to large intestinal health and, with even small quantities of dairy, a reduction in risk of stroke in later life.^{69,71}

CLINICAL NUTRITION PRACTICE GUIDELINES (CNPNG)

These are to be encouraged and are increasingly available. One of the earliest examples of the need for Asia Pacific CNPNG was that emanating from an Okinawan working group.^{32,72,73} As of now, examples include ones for nutritional support of neonates⁷⁴ and for the aged.⁷⁵ For nutritional support with vitamins⁷⁶ and minerals,⁷⁷ guideline revision is an established practice.

INTEGRATED CLINICAL AND PUBLIC HEALTH NUTRITION

The current health problems we see with food patterns are complex and, in turn, largely predicated on ecological disruption or loss.⁷⁸ While preventive (public health) and remedial (Clinical) strategies have broadly different responsibility domains, they overlap and synergise. They are reflected in a host of ecologically disordered health problems, such as impaired defence, microbiome and immune systems, energy dysregulation, sensory input disturbances, nature deprivation and societal dysfunction.⁷⁸ Published studies about obesity,⁷⁹⁻⁸³ diabetes and alcohol misuse are beginning to address these points.⁸⁴⁻⁸⁹

Community based initiatives, bringing together the many players involved in ecological disruption have a greater chance of favourably altering the current trajectories of increasing childhood obesity, diabetes and its complications, as illustrated in the EPODE studies.⁷⁸

Integrated approaches which encourage gardening, fruit and vegetable production and consumption are likely to have beneficial economic outcomes as well as health.^{90,91}

Engagement with the whole food system offers greater control over personal health.^{92,93}

SCENARIOS FOR FOOD AND HEALTH IN NE ASIA

The Global Financial Crisis (GFC) of 2008-9 led to food insecurity in NE Asia and elsewhere.⁹⁴ Aside from market and fiscal mischief and ineptitude, and their disproportionate effects on the disadvantaged, climate change, especially 15 years of drought in the major food producer, Australia, contributed to NE food insecurity at this time. Recurrent natural disasters, but of increasing frequency, beset NE Asia. These include earthquakes, typhoons, floods and droughts – and the potential for volcanic eruptions on the ‘ring-of-fire’.⁹⁵⁻⁹⁹

The most alarming scenario is that of rising temperatures on the Tibetan plateau, with increases greater than those previously thought, due to loss of glacial melt and of heat reflection, according to the Chinese Academy of Science division on climate science. It is estimated that all the rivers of Asia, emanating from the plateau will be drying-up in the next 20-30 years, affecting over 2 billion people. Along with this will be rising sea levels and super storms as a consequence of Arctic and Antarctic ice melts due to global warming. Nutrition science needs to contribute to ways of food production and consumption less dependent on non-renewable energy and fossil fuels.¹⁰⁰

The place of climate change in the future of food and health in NE Asia is its greatest threat and one which requires greater attention.

Population ageing is another challenge to food and water security in NE Asia, since biological resilience declines with age. In particular, the sense of thirst is impaired and the risk of heat stroke increased.¹⁰¹ The maintenance of physical activity at a higher plane allows a greater assimilation of essential nutrients from nutritious biodiverse food.¹⁰² Likewise, social activity and eating with others is a survival strategy.¹⁰³⁻¹⁰⁴ Scenarios with less social, mental and physical activity are to be avoided as we age. Fortunately, elderly people of Chinese ancestry generally increase their early morning activity as they age.¹⁰⁵

AUTHOR DISCLOSURES

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Review Article

The rise of clinical nutrition science in North-East Asia

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蓬勃發展中的東北亞臨床營養科學

有效執行臨床營養仰賴於生物醫學、社會及環境科學，與飲食模式、能量平衡（大部分與體能活動有關）及營養素代謝的健康相關問題的診斷技能、預防和管理的知識。它的傳遞需要考慮可近性、公平、可負擔及永續性。一般來說，這需配合在地及廣泛分布的健康服務。在東北亞，這些先決條件正符合一個持續增加的規模。這個進展的根基與其食物-健康連結及支持教育的文化息息相關。然而，如同其他地區，其食物及健康系統的安全與保障受被剝削操作的威脅。在中國，1980年代中期，臨床營養工作由醫學畢業生、護士及廚房工作人員管理，加速了全國各大主要醫院臨床營養發展，營養師則是在較近期才出現。相對的，日本已經長期廣泛訓練膳食療養工作人力，同時在大學或是食品-營養保健食品業有活躍的基礎營養科學組成。南韓及臺灣走與日本類似的軌道。如今，這些東北亞經濟體聚集快速動能，大量發表在公共衛生及臨床營養的創新方法。其前景不僅能改善健康狀況，同時也降低健康照護的社會及財政負擔。這對於他們所處的快速老化的社會尤其重要。氣候變遷所帶來的天然災害、水及糧食不安全對於億萬的亞洲人的生命與命運的威脅是一個日益嚴峻的挑戰。

關鍵字：工作人力、實證基礎營養學、臨床營養實踐指南