

# Nutritional Medicine in Primary Healthcare

**Benjamin I. Brown**

Dietary interventions and nutrient-based supplements can prevent disease, reverse established illness and improve health while being very safe and, in some cases, extraordinarily effective. Yet the scientific evidence for nutritional medicine is not well incorporated into medical training, and consequently nutritional therapy is underutilised in clinical practice to the detriment of good patient care.

What we eat is a major modifiable determinant of health. Dietary risk factors have been attributed to 11 million deaths amongst adults aged 25 years or older worldwide, 18% of all deaths in North America, and 22% of all deaths in Europe.<sup>1</sup> Adoption of healthier eating predictably reduces the risk of death and major chronic diseases.<sup>2</sup> A large number

of studies assessing the impact of dietary interventions on metabolic risk markers and hard endpoints have demonstrated important disease-modifying effects in areas such as cardiometabolic disease<sup>3,4,5</sup> autoimmune disorders<sup>6,7</sup> functional gastrointestinal disease,<sup>8</sup> endocrinological disease,<sup>9</sup> cancers<sup>10,11,12</sup> dermatological diseases<sup>13,14</sup> psychiatric illness<sup>15,16,17</sup> and neurodegenerative disease.<sup>18,19,20</sup>

The mechanisms by which food and food components such as micronutrients and other bioactive compounds prevent and treat disease include mitigation of DNA damage, maintenance of cell and tissue function, by acting as cofactors or components to thousands of metabolic processes, and involvement in biological processes intrinsic to health and longevity.<sup>21,22</sup>

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**Affiliation:** B. Brown is with the Nutritional Medicine Institute, London, UK, and the British College of Nutrition and Health (BCNH), London, UK.

**Corresponding author:** Benjamin I. Brown (email: [ben@nmi.health](mailto:ben@nmi.health))

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Despite the importance of an optimal daily supply of nutrients from food, most of the population have nutritional inadequacies. Amongst participants of the Heath Survey for England, 72% did not achieve the recommendations for daily fruit and vegetable intake.<sup>23</sup> Inadequate intake of micronutrients is a widespread public health problem globally.<sup>24</sup> In the UK, young adults are typically deficient in several essential micronutrients,<sup>25</sup> with the problem more pronounced in groups at higher risk of nutritional inadequacy, including children with poor-quality diets,<sup>26</sup> people consuming vegan diets,<sup>27</sup> pregnant women<sup>28</sup> and older adults.<sup>29</sup>

Even when consuming a relatively healthy diet, suboptimal micronutrient intakes can occur due to environmental factors related to the industrialisation of the food supply that have reduced nutrient levels in foods. For example, over the last 80 years there have been significant declines in the mineral content of fruit and vegetable crops in the UK, likely due to factors such as choice of cultivar or plant variety, a shift from organic practices to industrial practices, deleterious changes in soil ecosystems, and increases in atmospheric carbon dioxide.<sup>30</sup> Exacerbating the issue of suboptimal food quality, an individual's metabolic requirements for many different nutrients may be higher due to inherent genetic variations,<sup>31</sup> psychological and environmental stress,<sup>32</sup> functional health status,<sup>33</sup> medication use<sup>34</sup> and age-related malabsorption,<sup>35</sup> amongst other influences.

Nutrient-based supplements can optimise micronutrient intake and reduce the risk of nutritional deficiencies in the general population,<sup>36</sup> as well as in groups at particularly high risk of suboptimal nutrient status.<sup>37,38</sup> Intervention studies provide evidence for therapeutic applications of nutrient-based supplements in a wide range of areas, including mental health (e.g. magnesium,<sup>39</sup> ω-3 polyunsaturated fatty acids,<sup>40</sup> n-acetylcysteine<sup>41</sup>), cardiovascular disease (e.g. ubiquinone,<sup>42</sup> vitamin C,<sup>43</sup>

carnitine<sup>44</sup>), type-2 diabetes (e.g. resveratrol,<sup>45</sup> lipoic acid,<sup>46</sup> zinc<sup>47</sup>) and dementia (e.g. B vitamins<sup>48</sup>), to cite just a few examples in which nutrient-based supplements have been shown to prevent and/or treat disease.

There is enough evidence to incorporate nutrition in medicine; however, its implementation is lacking, in part due to poor nutritional literacy resulting from inadequacies in training<sup>49</sup> and longstanding bias against nutritional interventions.<sup>50</sup> This is despite an increasing appreciation for the role of nutrition in primary healthcare amongst medical students and a desire for improved education.<sup>51,52</sup> Better knowledge could facilitate the adoption of nutritional medicine and encourage interdisciplinary collaboration with clinical nutritionists, ultimately helping to bridge shortfalls in the management of nutrition-related disease.

The aim of the *Nutritional Medicine Journal* is to provide health professionals with authoritative and scientifically accurate articles on topics in nutritional medicine, with emphasis placed on publications relevant to the clinical application of patient-centred, integrative, personalised nutritional approaches that are focused on improving underlying pathophysiology or function to promote positive health outcomes.

Welcome to the inaugural issue.

**Benjamin I. Brown**

Editor, *Nutritional Medicine Journal*

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