Women's Health: Optimal Nutrition Throughout the Lifecycle

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ABSTRACT

Sex differences are an important consideration when researching and establishing policies for nutrition and optimal health. For women's health, there are important physiologic, neurologic, and hormonal distinctions throughout the lifecycle that impact nutritional needs. Distinct from those for men, these nutritional needs must be translated into appropriate nutrition policy that aims to not only avoid overt nutritional deficiency, but also to promote health and minimize risk for chronic disease.

Through a series of webinars, scientific experts discussed the advances in the understanding of the unique nutritional needs, challenges and opportunities of the various life stages for women across the life course and identified emerging nutritional interventions that may be beneficial for women.

Nevertheless, there is concern that existing nutrition policy intended for women's health is falling short with examples of programs that are focused more on delivering calories than achieving optimal nutrition. To be locally effective, targeted nutrition needs to offer different proposals for different cultural, socio-economic, and geographic communities, and needs to be applicable at all stages of growth and development. There must be adequate access to nutritious foods, and the information to understand and implement proven nutritional opportunities. Experts provided recommendations for improvement of current entitlement programs that will address accessibility and other social and environmental issues in order to support women properly throughout the lifecycle.

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INTRODUCTION

The 2030 agenda for sustainable development, adopted by the United Nations (UN), are the current cornerstone of many health policies. The importance of this agenda has recently been stressed by the successful and widely attended Tokyo Food Systems Summit, in December 2021, which launched bold new actions to deliver progress on all 17 Sustainable Development Goals (SDGs). These SDGs relate to nutrition not only by **SGD2 Zero Hunger**, or **SDG3 Good Health and Wellbeing** but also **SDG5 Gender Equality**. This is very important, as women are especially vulnerable regarding food insecurity in several life stages, such as pregnancy and frailty. As shown by, e.g., Dutch Hungerwinter studies, it is now well established that malnutrition *in utero* not only leads to low birth weights or less healthy babies but also impacts the occurrence of non-communicable diseases in later life. As such, healthy nutrition during an infant's first 1000 days, and also including the mothers, is key to healthy populations in all cultures.

An often overlooked life stage in women's nutrition is adolescence. Adolescents can be regarded as our future workforce and bearers of our next generation. Therefore, improving their health and development is crucial in shaping the health and wellbeing of this generation and the next and the next *ad infinitum*. During adolescence, numerous biological and psychosocial changes prompt the transition from childhood to adult life. It is a period of hormonal changes; the production of adrenal androgens increases, and the growth hormone and thyroid axes mature. In this period 50% of the adult body weight and 15-25% of final height are gained. In sum, adolescence is a period of rapid growth, and consequently, the energy and nutrient requirements increase. In addition, in this life stage dietary patterns, physical activity, and eating behavior are heavily influenced; by internal factors (such as attitudes, beliefs, perceived barriers, food preferences, self-efficacy, and biological changes), external factors (family, friends, fast food outlets, and social and cultural norms), and macrosystems (such as food availability, food production, distribution systems, mass media, and advertising). Thus, adolescents are nutritionally vulnerable because of the increased nutritional demands alongside the social adaptation to adulthood.

Often this period is referred to as the second window of opportunity, to catch-up with linear growth, and in addition to the first 1000 days is a crucial nutrition-sensitive developmental stage. Under the umbrella of a program called 'Ten-to-Twenty', several academic research projects have recently been carried out at Wageningen University. The study in Mexico focused on adolescent girls and boys aged 12-19 years and showed that both a Western- and plant-based dietary pattern were simultaneously associated with overweight–obesity and at least one indicator of undernutrition such as anemia. In Ghana, time trends in anthropometry in adolescent girls aged 15-19 years showed that thinness and stunting had declined since 2003, but that the prevalence of overweight and obesity had increased by 40%, while anemia remained severe. There is a double burden of malnutrition as evident in this vulnerable group, and becoming even more prominent, suggesting that obesity and anemia can co-occur in the same girls, which needs to be taken into account in dietary advice and nutrition programs. Indeed, an interdisciplinary study in Nepal among adolescent girls showed that thinness and anemia were negatively

associated with adolescent girls' aspirations in domains of fertility and education. Hence, multisectoral integrated policies and programs that improve adolescent nutritional status and diets have the potential to foster adolescent girls' objectives and thereby increase their future potential.

Menopause is another female life stage with health and nutritional consequences. Many deleterious physiological changes take place around this time point due to hormonal changes. In earlier studies, we have seen that hormonal changes induce changes in body fat composition and fat distribution. As a consequence, cardiometabolic risk factors increase and the risk of diabetes and CVD reach patterns similar to what is observed in males. A sharp bone mineral density (BMD) downturn is also observed at the same time; traditionally, calcium and vitamin D are regarded as important nutrients in preventing reduction in BMD and preventing osteoporosis. However, other nutrients may also play a role. Osteoporosis occurred more often among women whose nutritional status was marginal on vitamin B12, magnesium, and poor phytonutrient intakes. How women adjust their lifestyle during the menopausal period is critical for healthy ageing. Data mining studies showed that dietary patterns associated with better prognosis of geriatric syndromes are in line with plant-based diet. This study points at an emerging issue of concern in nutrition nowadays: the role of impact on the environment, i.e., not only considering human health but also planetary health. Eating less meat and shifting to a plant-based diet may be a good solution for this, but the context needs to be taken into account; in regions with food insecurity and high prevalence rates of anemia and other micronutrient deficiencies, a careful trade-off needs to be made.

Such efforts should include informed decisions on which nutrients and which amounts are needed from the industry perspective. Additionally, given the differential use of prenatal dietary supplement (DS) products based on maternal age, education, race and ethnicity, income, and health insurance status, clinician efforts should focus on increasing access to prenatal DS, and to understand the barriers to their use in population subgroups. Knowledge dissemination strategies may also be needed at the public health level to reduce nutrient disparities.

CONCLUSION

When considering women's ability to age healthfully, it must be more than just the narrow focus on reproduction and hormonal wellness. Physiological parameters associated with age-related decrements specific to women are part of the broader spectrum of opportunities and benefits to address gender-driven structural/functional distinctions and the role of nutrition.

There is a fundamental role for baseline recommendations for daily levels of vitamins and minerals, but also documented advantages ascribed to the intake of nutrients beyond simple adequacy, and attention to and education about should be part of the landscape to ensure consumption as part of a diet plentiful in these components. Diets need to be rich in proven constituents to achieve true 'healthy ageing' by supporting, for example, bone health, lactation, hormonal fluctuations and menopause.

Women, though with statistically significant longer lifespans, at least in the developing countries, must be recognized for their unique differential probability of some chronic diseases, such as their greater risk for bone and muscle loss. Nutrition focused on different cultural, socio-economic, and life-course communities, as well as applicable at all stages of growth and development must not be a one-size-fits-all approach. To be relevant to the individual, there needs to be a degree of 'precision' applied such that a generic singular nutritional template does not result in unwanted and unhealthy overages with potential concomitant health decrements often of more immediate concern than the under-nutrition scenario that prompted the original recommendation.

There must be access to nutritional foods, and the information to grasp and put into practice proven nutritional opportunities. Nutrition science is moving towards understanding optimal nutrition in the broader context of dietary patterns, and nutrient intake must consider the complexity of interactions involving not only adequate nutrition but also the interplay with social, behavioral, environmental, community dynamics, and many other lifestyle factors. ***Optimal is greater than the sum of the merely sufficient***.