**New Environmental-Related Approaches to Improved Eating Behavior and Nutrition across One’s Life Course**

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**Summary**

It is worthwhile to discuss new environmental-related approaches to eating behavior that are effective throughout one’s life course for better nutrition. Salt-reduction programs for children may benefit from strategies that actively engage families and teachers, according to a school-based cluster randomized controlled trial (School-EduSalt) in China to reduce salt intake in children and their families. Considering young people’s lifestyle, a population-based approach for healthy low-risk people is necessary; for example, the use of an educational song consisting of interesting sounds and lyrics as BGM may be effective. Self-monitoring of salt intake or salt concentrations in home seasoning by a versatile salinity meter may be another effective educational approach in reducing salt intake by raising the individual’s awareness on their rate of salt intake. Further, shift workers have increased risk of diet-related chronic conditions due to their eating habits. Moreover, mental illnesses among workers require nutritional approaches because they may have effects on subsequent weight changes. Finally, studies for the elderly suggest the importance of a nutritional approach especially for males living alone to prevent or improve frailty. A three-month approach that included nutritional education for the elderly reduced frailty, and the effects persisted post-intervention. These results are quite encouraging for nutritionists in their efforts to create a vibrant society, despite its incredibly age.

**Key Words**

eating environment, lifestyles, nudge intervention, population-based approach

The development of various new approaches to nutritional education that are specific to age, lifestyles, and environment, such as salt reduction or balanced diet, is becoming more important. This remains the priority action for addressing the crisis of noncommunicable diseases globally (1), and the nutritional problem varies by age. Additionally, mental illness affects subsequent weight changes, (2) suggesting an adverse effect on physical health.

**For children and their families**

For children and their families, school environment and social network factors can act as a vehicle for dietary improvement (3, 4). Wu and their collaborators reported a school-based cluster randomized controlled trial (School-EduSalt) to reduce salt intake in children and their families by 25% in China. The trial was conducted among children with a mean age of 10.1 y and their adult family members. Children in the intervention group were educated on the harmful effects of salt and how to reduce salt intake within the schools’ usual curriculum for 3.5 mo. Thereafter, the salt-reduction message was delivered to their families. The study showed that the program effectively lowered salt intake in both children and their families (3). The authors also found that social networks of children were associated with their behaviors to reduce salt intake (4). These studies suggest that future salt-reduction programs for children will benefit from strategies that actively engage families and teachers. Moreover, behavioral nudge intervention that improved positioning and serving of fruit, accompanied by attractive labeling of both fruit and vegetables on offer, encouraged children to select and consume more fruit with their lunchtime meal in a primary school cafeteria (5). These findings underscore the need to develop national strategies to promote healthy eating environments and social networks in schools.

**For young people**

Considering young people’s lifestyle, it is necessary to establish population approaches for healthy low-risk people compared to conventionally tailored interventions for high-risk people. Particularly in countries such as Japan, Korea, and China, where the primary sources of salt are soups and discretionary seasonings added to homemade foods or cooked foods already at the table (i.e., soy sauce and miso), public approaches raising the individual’s awareness on reducing salt intake may be effective. For instance, a song that encourages salt intake reduction consisting of interesting sounds and lyrics was developed as an educational tool (6). Use of educational songs as background music (BGM) is potentially becoming a common and versatile approach in food purchasing and/or eating environments to nudge consumers toward healthier choices. Maruya et al. (7)

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reported a small-scale community trial that compared the control (displayed visual materials for 5 wk) and the intervention (broadcasted BGM for another 5 wk) periods among unspecified consumers at a university canteen. The study suggested that using a dietary education song on salt intake as BGM is effective in influencing individuals toward making healthier menu choices, even though the subjects were healthy young women.

Additionally, self-monitoring of salt intake or salt concentrations in home seasoning by a versatile salinity meter is another effective educational approach in reducing salt intake by raising the individual’s awareness of their rate of salt intake. The self-monitoring urinary salt excretion measurement device improved the 24-h urinary sodium/potassium ratio in a parallel randomized trial among university students (8). The device is a useful and practical tool for short-term education of young individuals on dietary salt reduction. A double-blind randomized controlled trial conducted in a high-risk area reported that monitoring salt concentrations of homemade dishes had a potentially stronger salt-reducing effect than the use of low-sodium seasonings (9). However, another double-blind randomized controlled trial, which investigated the short- (three months) and long-term (six and twelve months) effects of monitoring salt concentration in homemade dishes reported a contrary finding. The study found that urinary sodium excretion returned to the baseline level in both the intervention and control groups after twelve months (10). These results demonstrate the need for a consistent approach.

For workers

For the relatively younger low-risk population, individual dietary habits depend on lifestyle, including their field/type of work. Shift workers have increased risk of diet-related chronic conditions due to their eating habits. Nakamura et al. (11) showed that shift workers were more likely to eat dinner at irregular times compared to daytime workers in Japan. Furthermore, shift work was associated with a higher risk of being overweight, higher total energy intake, and lower intake of dietary fiber, vitamins (folic acid and vitamin C) and minerals (potassium, calcium, and iron). This finding highlights the need for improvement of the diet of shift workers.

The association between mental health and diet is increasingly becoming a key focus area. A cross-sectional study among 2089 workers found an association between intake of zinc, copper, and manganese and mental health (12). However, a 3-y prospective study reported that balanced diet was not associated with the risk of depressive symptoms among 909 Japanese workers (13). These contrary findings may be due to a reversal of cause and effect, and thus, further studies that consider the influence of an individual’s support and network on eating behavior will contribute to a better understanding of the role of mental health. Nevertheless, mental illness may have an effect on weight loss or gain, (2) suggesting an adverse effect on physical health. Hence, assessing appropriate approaches for better nutrition, pre- and postmental illness is pertinent.

For the elderly

Demographic changes in Japan resulted in an increased number of elderly people living alone. Among adults living alone, males were more likely to consume an inadequate diet compared to females (14). A cross-sectional study reported an association between living alone and frailty among the elderly, (15) suggesting the importance of an effective nutritional approach especially for older males living alone to prevent or improve frailty. For example, a three-month approach including resistance exercise and nutritional education reduced frailty and improved functional health in older adults, and these effects persisted for at least three months post-intervention (16). This result is quite encouraging, especially for nutritionists in the effort to create a vibrant society, despite their clients being super aged.

Disclosure of state of COI

No conflicts of interest to be declared.

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