The Global Fruit & Veg Newsletter

n° 20

April 2017

Barriers to F&V consumption

Average intake of fruit and vegetables is, in Europe and North America, still below recommended levels. In addition, averages hide the disparities within a country, particularly with regard to an intake gradient according to socio-economic level. Knowing this, it is helpful to explain why individuals do not follow recommendations.

The articles presented in this edition of GFVN contain results that reveal how difficult it is to identify the barriers that are truly associated with fruit and/or vegetable intake. The three articles show that many of the perceived barriers, including those cited most often, are not related to fruit and/or vegetable intake. Conversely, some barriers may not be perceived as such by consumers.

Articles in this GFVN edition also illustrate the complexity of the mechanisms behind fruit and/or vegetable consumption. It is surprising that the effects of income on fruit intake are not mediated by the perception of high prices but by a non-appreciation of fruit (Dijkstra et al.). The high cost of healthy food influences the fruit and vegetable intake of people who are food secure but not those who are food insecure (Mook et al.).

Despite the different populations studied and the diversity of approaches, the three articles show that the low hedonic value attributed to healthy food (Mc Morrow et al.) or to fruit and/or vegetables (Dijkstra et al.; Mook et al) is a perceived barrier significantly linked to a lower fruit and/or vegetable intake. It is clear, therefore, that ways and opportunities to more frequently taste and consume a greater variety of fruit and vegetables should be provided, which will make these foods more attractive. In this way, the notion that healthy equals less tasty could be dispelled among those with low intake levels.

Sylvie Issanchou

Research Director, Centre for Taste and Feeding Behavior
INRA - French Institute for Agricultural and Food Research
Dijon, FRANCE

© Philippe Dubois / Interfel

Acknowledgement to 250 contributors since 2006

June 2014 : K. Allen; G. Mitrou; F. Veira-McTiernan & M. Wiseman; C. Hawkes (Issue to be managed by WCRF)

July/August 2014 : M. Padilla; T. Bucher; B. Wansink; DR. Taber (Improving school meal : Efficient way to increase F&V consumption in children)

September 2014: P. Chandon; W. Watson; S. Pettigrew; K. Chapman & C. Hughes; S. Thomas; J. Martin-Biggers (Advertising for fruit and vegetables is globally inexistent)

October 2014: A. Martin; D. Ethan; TM. Horacek; JE. Pelletier & MN. Laska (Food store environments in USA)

November 2014: E. Rock; J. Harasym; JA. Lovegrove; ZJ. Dai (An updating on antioxidants and F&V consumption)

Perceived barriers towards healthy eating and their association with fruit and vegetable consumption

Mc. Morrow and colleagues

Health Economics Research Unit, Institute of Applied Health Sciences, University of Aberdeen, UK

Improving population diet is a key public health target. Poor dietary intakes have been associated with higher risk of non-communicable diseases, such as cardiovascular diseases, cancer, and type 2 diabetes, which have large health and economic consequences[1]. James et al. stated there is an enormous potential health gain through eating a healthier diet[2]. Exploring individual's perceived barriers towards healthy eating may increase understanding of an individual's diet, specifically fruit and vegetable consumption. This study investigates the associations between self-reported fruit and vegetable consumption and perceived barriers towards healthy eating.

The Scottish Health Survey 2008-2011

This study used Scottish Health Survey data, a nationally representative survey of Scottish households[3]. Data were pooled from 2008, 2009, 2010, and 2011. The Knowledge, Attitudes and Motivations (KAM) module is completed by adults over 16 years of age and includes questions on perceived barriers towards healthy eating (n=8,319). Respondents are asked to select any of the following perceived barriers to healthy eating that apply:

- a lack of willpower,
- healthy foods are too expensive,
- hedonics (healthy foods are too boring, I don't like the taste),
- a lack of availability,
- a lack of preparation time,
- a lack of cooking skills,
- a lack of information on healthy eating,
- other barriers, or
- a lack of support from others (family, friends, colleagues).

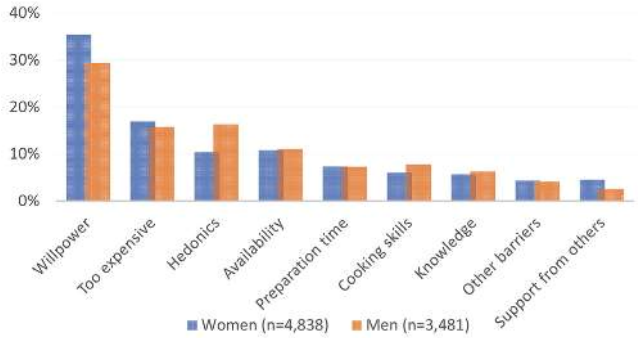
Respondents also self-report their fruit and vegetable consumption the previous day which is dichotomised to indicate if the individual consumes the recommended 400 grams of fruit and vegetables per day, or known in the UK as "five-a-day".

Probit regression models were estimated to test the association between meeting the five-a-day recommendation and perceived barriers to healthy eating. Separate models were estimated for men and women controlling for a range of demographic (age, location, marital status, number of children in household), socio-economic (income, education, economic activity) and lifestyle (alcohol consumption, exercise, smoking status) factors. Marginal effects were estimated from the probit models to quantify the effect of each variable.

Willpower is the most commonly reported perceived barrier to consume F&V

Twenty-one percent of men report consuming five-a-day compared to 25% of women. Figure 1 shows willpower is the most commonly reported perceived barrier in the sample followed by healthy foods being too expensive for women, and hedonics for men.

Figure 1: Proportion of respondents reporting each perceived barrier by gender



Women who reported a lack of cooking skills were less likely to meet the F&V recommendations

For women, reporting willpower as a perceived barrier to healthy eating reduces the probability of meeting the recommended fruit and vegetable intake by 3.00%. Reporting a lack of cooking skills (10.3%) and a lack of preparation time (5.6%) also significantly reduced the probability of eating five-a-day. Hedonics is the only significant barrier for both men (6.8%) and women (10.2%). Interestingly, perceiving healthy foods as too expensive was not significantly associated with consuming five-a-day despite being reported by 16.9% of women and 15.7% of men.

This analysis shows that not all commonly reported perceived barriers are associated with F&V consumption

This study gives an important insight into the relationship between perceived barriers to healthy eating and the probability of individuals consuming the recommended fruit and vegetable intake. Existing studies have identified commonly reported perceived barriers amongst populations, but this study estimates their effects on an individual's fruit and vegetable consumption. This analysis shows that not all commonly reported perceived barriers are associated with fruit and vegetable consumption. Willpower was the most commonly reported barrier but only had a significant effect on fruit and vegetable consumption amongst women. Perceiving healthy foods as too expensive was also commonly reported barrier but was insignificant in the analysis. One possible explanation is that perceiving price as too expensive may not be a factor for fruit and vegetable consumption but may be important for other aspects of healthy eating.

Policy makers could adopt interventions…

… which address a higher proportion of the population, for example a lack of willpower in women, which may have a smaller effect on fruit and vegetable consumption. Or choose a more targeted approach, for example a lack of preparation time in women which may have a larger effect on fruit and vegetable consumption.

This work has been accepted for publication in the Journal of Public Health, doi: 10.1093/pubmed/fdw038

References

1. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013-2020. Geneva: World Health Organization; 2013.

2. James WP, Nelson M, Ralph A, Leather S. Socioeconomic determinants of health. The contribution of nutrition to inequalities in health. BMJ. 1997 May 24;314(7093):1545-9.

3. Scottish Executive. The Scottish Health Survey 2011: Volume 3: Technical Report. 2012.

Perceived barriers explaining socio-economic status differences in adherence to the F&V guidelines in Dutch older adults

S.C. Dijkstra[a], J.E. Neter[a], I.A. Brouwer[a], M. Huisman[b], M. Visser[a]

a. Department of Health Sciences and the EMGO Institute for Health and Care Research, Faculty of Earth and Life Sciences

b. Department of Epidemiology and Biostatistics and the EMGO Institute for Health and Care Research, Faculty of Earth and Life Sciences, Amsterdam, THE NETHERLANDS

People with a lower socioeconomic position (SEP) meet the dietary guidelines less often than people with a higher SEP[1-2]. These SEP differences in dietary intake are also found among older adults[3-4]. To increase fruit, vegetable and fish intake in the general population barriers to healthy eating have been identified including; disliking, limited cooking skills, no time to prepare healthy food, perception of high costs, no availability, or no motivation to change eating habits[5-8]. SES differences in these barriers have also been described, where low income groups spend less money on healthy foods than higher income groups[6, 9] and low education groups lack knowledge about healthy eating compared to higher education groups[10]. Despite the fact that it is important to investigate SES differences in barriers to healthy eating, research among older adults is scarce. Older adults may face specific age-related barriers such as loss of appetite, chewing problems, decreased mobility, limited transport that may all negatively influence food choice and food intake[11-14]. It is not clear from the literature if the impact of SEP on healthy eating and barriers is also present in older adults. Therefore, this study identified barriers for meeting the fruit, vegetable and fish guidelines in older Dutch adults and investigate SEP differences in these barriers. Furthermore, the mediating role of these barriers in the association between SEP and adherence to these guidelines.

1,057 community dwelling adults, aged 55-85 years

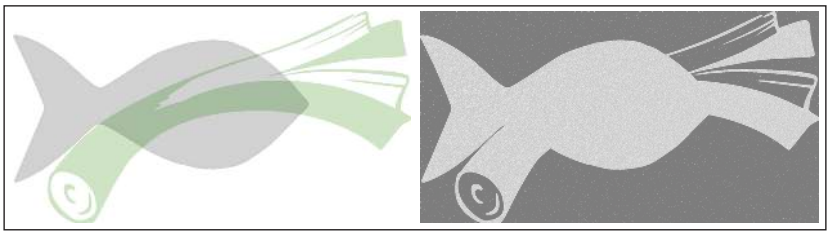
This cross sectional study used data from the Longitudinal Aging Study Amsterdam (LASA), an ongoing cohort study originally designed to investigate changes in autonomy and well-being in the aging population in the Netherlands[15]. We used data from 1,057 community dwelling adults, aged 55-85 years. SEP was measured by level of education and household income. A food frequency questionnaire was used to assess fruit, vegetables and fish intake and barriers to meet the guideline for fruit, vegetables and fish were measured with a self-reported lifestyle questionnaire. Respondents were asked to indicate, from a list of twelve barriers, the two barriers that were most important for their situation.

Based on the self-reported dietary intake data, we calculated adherence to the Dutch dietary guidelines for fruit, vegetable and for fish. The following criteria were used: two portions of fruit per day (a maximum of one glass of fruit juice (200 ml) to replace one portion of fruit), four serving spoons of vegetable per day (200 grams) and fish twice a week[15]. To assess the barriers as potential mediating variables in the association between SEP and adherence to the guidelines for fruit, vegetable and fish we conducted structural equation modeling.

48.9% of the respondents perceived a barrier to adhere to the fruit guideline, 40% for the vegetable

Overall, 48.9% of the respondents perceived a barrier to adhere to the fruit guideline, 40% for the vegetable and 51.1% for the fish guideline. The most frequently perceived barriers in the total sample were “the high price” of fruit and fish and “a poor appetite” for vegetables. Lower levels of income and education were statistically significant associated with a higher probability to perceive any barrier to meet the fruit, vegetable and fish guideline. Furthermore, lower income levels were statistically significant associated with lower adherence to the fruit guideline and the fish guideline. No association between income and adherence to the vegetable guideline was observed. Lower education levels were statistically significant associated with lower adherence to the vegetable guideline. Level of education was not associated with adherence to the guidelines for fruit and fish. The association between income and adherence to the fruit guideline was mediated by “perceiving any barrier to meet the fruit guideline” and the barrier “dislike fruit”. The association between income and adherence to the fish guideline was mediated by “perceiving any barrier to meet the fish guideline” and the barrier “fish is expensive”.

The findings of this large scale study in older Dutch adults suggests that focusing on barriers to meet the fruit and fish guideline and in particular taste preferences and cost concerns may be important in reducing income inequalities in fruit and fish intake among older adults. Affordable and accessible healthy foods and interventions aiming on improving liking of fruit, could potentially increase fruit and fish intake in older adults, especially in populations with lower incomes. Future studies in older persons should be conducted to test whether removal of these barriers in fact lead to better dietary adherence.



References

1. Malon, A., et al.. J Am Diet Assoc, 2010. 110(6): p. 848-56.
2. Giskes, K., et al. Public Health Nutr, 2006. 9(1): p. 75-83.
3. Van Rossum, C.T., et al. Eur J Clin Nutr, 2000. 54(2): p. 159-65.
4. Dijkstra, S.C., et al.. J Nutr Health Aging, 2014. 18(2): p. 115-21.
5. Brug, J., et al. J Nutr Educ Behav, 2006. 38(2): p. 73-81.
6. Marcy, T.R., M.L. Britton, and D. Harrison. Diabetes Ther, 2011. 2(1): p. 9-19.
7. Schatzer, M., P. Rust, and I. Elmadfa. Public Health Nutr, 2010. 13(4): p. 480-7.
8. Van Duyn, M.A., et al.. Am J Health Promot, 2001. 16(2): p. 69-78.
9. Haynes-Maslow, L., et al. Prev Chronic Dis, 2013. 10: p. E34.
10. McLeod, E.R., K.J. Campbell, and K.D. J Am Diet Assoc, 2011. 111(5): p. 696-704.
11. Hughes, G., K.M. Bennett, and M.M. Hetherington,. Appetite, 2004. 43(3): p. 269-76.
12. Holmes, B.A. and C.L. Roberts. Eur J Clin Nutr, 2011. 65(4): p. 538-45.
13. Donini, L.M., C. Savina, and C. Cannella. Int Psychogeriatr, 2003. 15(1): p. 73-87.
14. Appleton, K.M., et al. Public Health Nutr, 2010. 13(4): p. 514-21.
15. Huisman, M., et al. 2011. 40(4): p. 868-76.

The moderating effect of food security status on the association between documented barriers and fruit and vegetable intake

Kim Mook[a], Barbara A. Laraia[b], Vanessa M. Oddo[c], Jessica C. Jones-Smith[c]

a. Johns Hopkins University Bloomberg School of Public Health, Department of Health Policy and Management, Baltimore, Maryland
b. University of California, Berkeley School of Public Health, Department of Community Health and Human Development, Berkeley, California
c. Johns Hopkins University Bloomberg School of Public Health, Department of International Health, Baltimore, Maryland - USA

Barriers to fruit and vegetable intake

Diets rich in nutrient-dense foods like fruit and vegetables can promote health, prevent obesity, and lower risk for chronic diseases, such as heart disease, type 2 diabetes, and cancer. Despite these benefits, most Americans do not meet recommendations for daily fruit and vegetable intake. Studies investigating barriers to fruit and vegetable intake have identified several key factors associated with consumption, including: taste preferences, food preparation time, cost, and access. While most studies control for socio-economic variables, few consider the role of food insecurity. Food insecurity is commonly associated with poor nutrition and diet, poor health, and higher rates of female obesity, after controlling for income. The objective of this study was to investigate whether the relationship between barriers to healthy food consumption and reported intake rates differs by food security status.

This study utilized cross-sectional data collected within economically deprived neighborhoods to investigate the association between self-reported barriers to healthy food consumption and dietary intake of residents in Oakland, California from 2013 to 2014. Recruitment materials were sent to residents (n=10,792) in selected economically deprived census tracts. The analytic sample included 531 participants. The Johns Hopkins Institutional Review Board approved the study, including an unsigned, passive consent form.

Using a 26-item Dietary Screener Questionnaire (DSQ), we measured average daily intake of fruit and vegetables. We also assessed self-reported barriers to healthy food consumption, including:

1) Micro-level barriers: taste preference, cost restrictions, and time to prepare food ("busyness"),

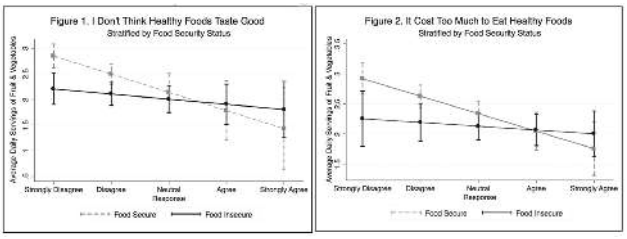
2) Mezzo-level barriers: assessments of produce selection, quality, and availability.

Multivariate linear regression assessed associations between micro- and mezzo-level barriers and reported fruit and vegetable intake. We assessed variation in the association between barriers to healthy food consumption and fruit and vegetable intake by food security status with an interaction term. Food security status was collected using the USDA ERS 6-item food security scale.

Study results

We found important differences by food security status in the relationship between perceived barriers to consumption and self-reported fruit and vegetable consumption, after controlling for income.

Among the food secure, disliking healthy food taste ($ß_{cost}$ taste: -0.38; 95% CI: -0.60, -0.15) and cost concerns ($ß_{cost}$: -0.29; 95% CI: -0.44, -0.15) were associated with lower intakes of fruit and vegetables. Subsequently, interventions making healthy foods more appealing, easy to prepare, and more cost efficient may be effective among the food secure.



Interestingly, fruit and vegetable intake among the food insecure was associated with busyness but not taste or cost. The lack of association with taste preferences is consistent with literature suggesting lower-resource households feel they have less choice when it comes to diet, given their constrained resources. A food secure family may be able to discriminate between foods based on taste preferences, while a food insecure family may have fewer options when shopping on a limited budget. The lack of association between cost concerns and intake in this study is unexpected; other studies have found cost highly influential on food decisions among low-resource populations, and food insecure respondents in this study were three times as likely as food secure respondents to report cost concerns as a barrier. However, some studies have found low-resource households do not always report cost as a direct barrier to healthy food intake. Households may be accustomed to budgeting for low consumption rates of fruit and vegetables such that they no longer consider cost a barrier. More research is needed on the association between taste, cost and consumption among food insecure populations.

Being "too busy" to prepare healthy foods

Contrary to the moderating effect played by food security in taste and cost analyses, feeling too busy to prepare healthy foods ("busyness") was associated with reduced intake among both food secure and food insecure populations. This finding is consistent with other studies that have found busyness and preparation time to be associated with intake, particularly among low resource families. Given that higher rates of in-home food preparation are associated with higher diet quality, attempting to reduce healthy food preparation time (actual or perceived), increase the convenience of accessing healthy food, or provide more meal-planning resources may be appropriate for both food secure and food insecure populations.

Next steps

These results suggest that food security status should be included in studies investigating barriers to healthy food intake, in addition to income, and food security status should be considered when designing and targeting dietary intervention and policy suggestions.

Based on: *Mook, K., Laraia, B. A., Oddo, V. M., & Jones-Smith, J. C. (2016). Peer Reviewed: Food Security Status and Barriers to Fruit and Vegetable Consumption in Two Economically Deprived Communities of Oakland, California, 2013–2014. Preventing chronic disease, 13.*