Research report

Misperception of self-reported adherence to the fruit, vegetable and fish guidelines in older Dutch adults ☆

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

[a] Department of Health Sciences and the EMGO Institute for Health and Care Research, Faculty of Earth and Life Sciences, VU University Amsterdam, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands
[b] Department of Epidemiology and Biostatistics, VU University Medical Center, Amsterdam, The Netherlands
[c] The EMGO Institute for Health and Care Research, Faculty of Earth and Life Sciences, VU University Amsterdam, The Netherlands
[d] Department of Sociology, VU University Amsterdam, The Netherlands
[e] Department of Psychiatry, VU University Medical Center, Amsterdam, The Netherlands

ABSTRACT

In this study we investigated (the degree of) misperception of adherence to the fruit, vegetable and fish guidelines in older Dutch adults and examined to what extent misperception is associated with socio-economic position (SEP) and other demographic, lifestyle and nutrition-related characteristics. The sample included 1057 community dwelling adults, aged 55–85 years, who participated in the Longitudinal Aging Study Amsterdam. Respondents completed a lifestyle questionnaire which included a food frequency questionnaire to calculate fruit, vegetable and fish intake. After current dietary guidelines were explained, respondents were asked to indicate whether they believed they adhered to the fruit, vegetable and fish guidelines. Characteristics potentially associated with misperception included level of income and education, lifestyle factors, nutritional knowledge, as well as attitude, social support and self-efficacy toward healthy eating. In the total sample, 69.1% of the older adults reported to adhere to the fruit guideline, 77.5% to the vegetable guideline, and 36.4% to the fish guideline. Based on the calculated intake data, 82.6% adhered to the fruit guideline, 65.5% to the vegetable guideline and 33.8% to the fish guideline. Overestimation of adherence was most common for the vegetable guideline (18.7%). Multivariate analysis, adjusted for level of income as well as for attitude and self-efficacy toward healthy eating, showed that lower educated respondents were more likely to overestimate their adherence to the vegetable guideline (relative index of inequality (RII): 2.97 (95% CI: 1.47–6.01)). Overestimation rates for fish (3.4%) and fruit (2.3%) were lower and not associated with any of the characteristics. This study showed that overestimation in older adults was common for adherence to the vegetable guideline and especially in those with a lower education level, but not for adherence to the fruit and fish guideline.

© 2014 Elsevier Ltd. All rights reserved.

Introduction

It is beyond doubt that nutrition is related to health and disease. A healthy diet, rich in fruit, vegetables and fish, is consistently associated with longevity, better quality of life, as well as better cardiometabolic and cognitive health in older adults (Anderson et al., 2011; Bellavia, Larsson, Bottai, Wolk, & Orsini, 2013; Gopinath, Russell, Flood, Burlutsky, & Mitchell, 2014; He, Nowson, Lucas, & MacGregor, 2007; Kiefte-de Jong, Mathers, & Franco, 2014). Despite these positive health effects the intake of fruit, vegetables and fish is far below the recommendations (Baker & Wardle, 2003; Dijkstra, Neter, Brouwer, Huisman, & Visser, 2014).

But why do people eat what they eat? The process involved in food choices is complex. People's awareness of their own dietary intake seems to be an important determinant of diet quality. Research shows that not all people are aware of their own intake or aware of the fact that their dietary intake is below the recommended level (Bogers, Brug, van Assema, & Dagnelie, 2004; Lake et al., 2007). Of those who misperceive their diet quality, the overestimators are of special concern, since they eat lower amounts than recommended, but are not aware of their suboptimal intake. Based on the precaution adaption process model people need to be

aware of their own risk behavior, before they are able to change their behavior (Weinstein & Sandman, 1992). It is unlikely that overestimators are open to health promotion messages. This makes them a potential risk group for the development of diet-related chronic diseases. Factors influencing food choice change with age (Drewnowski & Shultz, 2001) and misperception rates found in younger population groups do not necessarily apply to older adults. However, to our knowledge no studies have focused on dietary misperception in older adults. Moreover, only few studies have assessed characteristics that are associated with misperception and provide insight in potential risk groups in adults. These studies have observed that misperception was associated with level of education (Glanz, Brug, & van Assema, 1997), attitude toward nutrition (Bogers et al., 2004; Variyam, Shim, & Blaylock, 2001) and perceived behavioral control (Bogers et al., 2004). Older adults are a heterogeneous population group. In previous research we showed that older adults with lower education and income levels meet the fruit, vegetables and fish guidelines less often than their counterparts with higher socio-economic position (SEP) (Dijkstra et al., 2014). Explanations for these differences in older adults are unknown. Misperception could be a possible pathway explaining the socio-economic differences in adherence to one of the three guidelines. Therefore, the aim of this study was to investigate (the degree of) misperception of adherence to the fruit, vegetable and fish guidelines in older Dutch adults and to examine to what extent misperception is associated with SEP and other demographic, lifestyle and nutrition-related characteristics.

Material and methods

Respondents

We 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. Details on the sampling and data collection procedures have been described elsewhere (Huisman et al., 2011). In summary, a random sample stratified by age, sex, and expected five year mortality was drawn from the population registers of 11 municipalities in three geographical areas in The Netherlands. In total, 3107 subjects were enrolled in the baseline examination (1992–1993) and were representative of the Dutch older population. In 2002–2003, a new cohort of 1002 subjects, aged 55–65 years was added to the study using the same sampling procedures. Examinations were repeated every 3 years.

The source population for the current study consisted of 2165 LASA respondents who participated in the fourth LASA cycle (2005/2006) and were invited to participate in the LASA Lifestyle Study, an ancillary study conducted in 2007. Eligibility criteria were age <80 years, independently living and good global cognitive functioning (Mini Mental State Examination score >23). In total 1421 respondents met these criteria, of which 1058 completed a self-administered lifestyle questionnaire by mail (response rate 74.5%, 326 no response, 18 refused, 8 were not able due to physical problems and 11 deceased). We excluded one person because all dietary data were missing. The study was approved by the ethical review board of the VU University Medical Center (Amsterdam, The Netherlands), and all participants gave informed consent.

Calculated adherence to the fruit, vegetable and fish guideline

We assessed the intake of fruit, vegetable and fish with a short food frequency questionnaire to obtain information on the consumed frequency and amount of food items. This method has shown to be a valid, inexpensive and easy tool to provide a reasonably accurate ranking of intake and to identify persons with a low intake

(Block, Gillespie, Rosenbaum, & Jenson, 2000; Kim & Holowaty, 2003). Respondents indicated how many days per week they usually consumed fruit. They could choose from nine response categories ranging from 'never' to 'every day'. They also indicated the number of portions they consumed ranging from 'less than one' to 'more than five portions' per day. To illustrate one portion of fruit, written examples were given (e.g. one medium-sized apple, two mandarins or a handful of grapes). Respondents also indicated the frequency and number of glasses of fruit juice (fresh/bottled) per day. Furthermore, they indicated how many days per week they usually consumed raw vegetables (lettuce/salads) and cooked/baked vegetables (fresh/tinned, including hotchpotches and prefabricated meals). Again, they could choose from nine response categories ranging from 'never' to 'every day'. Next, they indicated the amount of raw vegetables and cooked/baked vegetables consumed per day. The amount was asked in number of serving spoons (one spoon represented 50 g of vegetables) with seven response categories ranging from 'less than one' to 'more than five spoons'. Lastly, respondents indicated how many days per week they usually consumed fish, with nine response categories ranging from 'never' to 'every day'. This method is similar to the one used in the Dutch National Food Consumption Survey 2007–2010 (van Rossum, Fransen, Verkaik-Kloosterman, Buurma-Rethans, & Ocke, 2011). Because fish is mostly eaten in standard portions and the fish recommendation is expressed in frequencies per week, we did not ask details on the serving size of fish.

Based on the self-reported dietary intake data, we calculated adherence to the Dutch fruit, vegetable and fish guidelines. The following criteria were used: two pieces of fruit per day (with a maximum of one glass of fruit juice (200 ml) to replace one piece of fruit), four serving spoons of vegetables per day (200 g) and fish at least twice a week ('Guidelines for a healthy diet', 2006). Potatoes were not counted as a vegetable.

Self-reported adherence to the fruit, vegetable and fish guidelines

Self-reported adherence to the guidelines was inferred from self-reported responses on the questions based on the transtheoretical model from Prochaska et al. (Prochaska & DiClemente, 1983, 1984). After explaining the guideline for fruit, respondents indicated which of the statements about adherence to the fruit guideline fitted their situation the best, with seven response categories ranging from 'I did not know that it is healthy to eat fruit' to 'I eat at least two pieces of fruit every day and I have been doing this during the last six months'. We asked the same question for vegetables (more than or 200 g/day) and for fish (more than or twice weekly). Self-reported perceived adherence to the guidelines was categorized as 'yes' if respondents indicated that they ate more than or two pieces of fruit per day, more than or 200 g of vegetables per day or more than or twice fish a week, and started doing this during the last 6 months, or had been doing this for longer than 6 months already. The other responses were categorized as 'no'.

Characteristics potentially associated with misperception

Based on previous research we examined characteristics that are potentially associated with misperception of adherence to one or more of the three guidelines (Bogers et al., 2004; Brug, de Vet, de Nooijer, & Verplanken, 2006; Brug, Van Assema, Lenderink, Glanz, & Kok, 1994; Lake et al., 2007). Socio-demographics included sex and age. Lifestyle factors included body mass index (BMI) and physical activity in the past 2 weeks as well as smoking status and alcohol consumption during the past year. We calculated BMI as measured weight in kilograms divided by measured height in meters squared. We defined physical activity as the average number of minutes of physical activity performed per day including walking,