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## Socioeconomic differences in dietary intake of older adults

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2016

### **document version**

Publisher's PDF, also known as Version of record

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### **citation for published version (APA)**

Dijkstra, S. C. (2016). *Socioeconomic differences in dietary intake of older adults*.

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# SUMMARY

## INTRODUCTION

Nowadays, all Western countries face large and growing socioeconomic differences in health. In the Netherlands, lower educated people live on average six years shorter than higher educated people. The differences in healthy life expectancy are even larger: almost 19 years. Research performed in the past decade shows that socioeconomic health differences are mainly caused by a higher exposure to a wide range of unfavorable risk factors of people with a lower socioeconomic position (SEP). One behavioral factor that may be part of the broader causal pathway is dietary intake. It has been shown that unhealthy dietary behavior is more prevalent among groups with a low SEP. Unhealthy diets are associated with a higher risk of diet related chronic diseases. The identification of factors that explain SEP differences in dietary intake is of paramount importance for the development of interventions and policies aiming to reduce SEP differences in diet and consequently health.

The Western population is rapidly getting older. A healthy diet is important for older adults' health. Only few studies have investigated the association between SEP and dietary intake in older adults. Even fewer have focused on factors associated with SEP or factors that explain SEP differences in dietary intake in older adults. There may be additional factors that have a unique influence in older adults, such as health related motivations, or specific barriers to eat healthily, for example functional limitations in going out to buy groceries, preparing meals or chewing problems.

## OBJECTIVE

The overall purpose of this thesis was to investigate SEP differences in adherence to the fruit, vegetable and fish guideline in older Dutch adults and to unravel potential pathways underlying these SEP differences. We investigated:

- 1) If socioeconomic position (SEP) is associated with adherence to the fruit, vegetable and fish guidelines in older Dutch adults.
- 2) Whether motivations to eat healthily, misperception and barriers with regard to adherence to the fruit, vegetable and fish guidelines are associated with SEP in older Dutch adults.
- 3) To what extent barriers with regard to adherence to the fruit, vegetable and fish guidelines explain SEP differences in adherence to the these guidelines in older Dutch adults.
- 4) Whether the intake of fruit and vegetables changed over time and if this change is associated with socioeconomic factors.

To this end, data from two Dutch observational cohort studies of a general older population were used. Chapters 2, 3, 4 and 5 show data from the Longitudinal Aging Study Amsterdam (LASA) and include 1,057 older adults, with a mean age of 68.9 years. For chapter 6, data from the longitudinal GLOBE study were used and includes 2,978 adults, with a mean age of 53.4 years.

## RESULTS

### **Conclusion 1: Older adults with lower levels of education and income are less likely to meet the fruit, vegetable and fish guidelines.**

This chapter describes adherence to the fruit, vegetable and fish guidelines in older adults and investigates the independent association between three SEP indicators and dietary adherence. The SEP indicators that were included were level of education, level of income and level of occupational prestige.

Of the older adults, almost 83% reported to adhere to the fruit guideline, 65% to the vegetable guideline and 32% to the fish guideline. Cross-sectional analyses show that older adults with lower education levels were less likely to adhere to the vegetable guideline than those with higher education levels. Older adults with lower income levels were less likely to adhere to the fruit and fish guidelines than those with higher income levels. Level of occupational prestige was not associated with adherence to any of the guidelines in older adults.

These results show that there is room to improve fruit, vegetable and fish intake in older adults and that there are clear and independent education and income differences in adherence to these guidelines among older adults.

**Conclusion 2: Motivations to eat healthily are different for distinct socioeconomic groups of older adults.**

This chapter identifies motivations to eat healthily in older adults and investigates the independent association with level of education, level of income, and other demographic, lifestyle and health characteristics.

The results show that the most frequently reported motivations to eat healthily were “feeling fit”, “current health” and “body weight”. Cross-sectional analyses show that older adults with lower education and income levels were less likely to report “to prevent diseases” as a motivation to eat healthily than those with higher education and income levels. Older adults with lower education levels were more likely to report “taste preferences” and “my current disease” as motivations to eat healthily than those with higher education levels. This study also shows different motivations to eat healthily for older adults with overweight, chronic diseases and for those with a poor self-rated health.

These results suggest that motivations to eat healthily depend on socioeconomic circumstances of older adults. Consequently, promotion messages to eat healthily can be expected to be more effective if they focus on the specific motivations of different SEP groups.

**Conclusion 3: Older adults with lower education levels are more likely to overestimate their adherence to the vegetable guideline.**

This chapter describes the degree of misperception of adherence to the fruit, vegetable and fish guidelines in older adults and investigates if misperception is associated with SEP and other demographic, lifestyle and nutrition related characteristics. The results show that overestimation was most common for adherence to the vegetable guideline. Overestimation rates for adherence to the fruit and fish guidelines were very small. Cross-sectional analyses show that older adults with lower education levels were more likely to overestimate their adherence to the vegetable guideline than those with higher education levels. Level of income was not associated with overestimation to any of the guidelines.

These results suggest that older adults with lower education levels and who do not meet the vegetable guideline are more likely to be unaware of their insufficient vegetable intake. Therefore, they are less likely to respond to health promoting messages aiming to improve vegetable intake and consequently fail to change their behavior.

**Conclusion 4: The barriers “cost concerns” for fish and “dislike” of fruit explain lower adherence to the fruit and fish guidelines in older adults with a lower income.**

This chapter identifies barriers for adherence to the fruit, vegetable and fish guidelines in older adults and investigates SEP differences in these barriers. Furthermore, it describes if these barriers were mediators that explained SEP difference in adherence to the guidelines.

The results show that barriers for adherence to the fruit, vegetable and fish guidelines are commonly reported by older adults. The most frequently reported barriers in older adults with lower education or income levels were the “high price” of fruit, vegetables and fish. Barriers that were most frequently reported by higher SEP groups were “concerns about pesticide residues” for fruit and vegetable, “time concerns for preparation” for vegetables and “habits and traditions” for fish. Furthermore, older adults with lower education and income levels perceived more barriers than those with higher education and income levels. Mediation analyses show that perceiving any barrier to meet the

fruit guideline and the barrier “dislike fruit” mediated the association between income and adherence to the fruit guideline. Perceiving any barrier to meet the fish guideline and the barrier “fish is expensive” mediated the association between income and adherence to the fish guideline. No mediating barriers for the association between education and adherence to the fruit, vegetable or fish guidelines were found.

These results suggest that focusing on barriers with regard to adherence to the fruit and fish guidelines and in particular “cost concerns” for fish and “dislike” for fruit may be important in reducing income differences in fruit and fish intake in older adults.

**Conclusion 5: Lower income groups have decreased their fruit and vegetable intake more than those with higher incomes between 2004 and 2011.**

This chapter describes intake changes of fruit and vegetables between 2004 and 2011 and investigates SEP differences in intake and intake change. Furthermore, it describes if socioeconomic barriers were mediators that explained the SEP difference in intake change.

Longitudinal analyses show that fruit and vegetable intake changed between 2004 and 2011. Respondents with lower education levels were more likely to report a decrease in raw vegetable intake frequencies than those with higher education levels. Respondents with lower income levels were more likely to report a decrease in intake frequencies of fruit, cooked vegetables and raw vegetables. Experiencing “financial distress” and “price concerns” with regard to fruit and vegetables partly explained the changes in income difference in fruit and vegetable intake between 2004 and 2011.

These results suggest a widening of relative income differences in fruit and vegetable intake between 2004 and 2011. Focusing on barriers with regard to “cost concerns” and “financial distress” may be important in reducing the widening of income differences in fruit and vegetable intake.

## OVERALL CONCLUSION

Overall, the results of this thesis show that in Dutch older adults, substantial income and education differences in adherence to the fruit, vegetable and fish guideline exist. It also shows that older adults with a lower SEP perceive other motivations to eat healthily and overestimate their vegetable intake more often than those with a higher SEP. Furthermore, older adults with a lower SEP perceive more barriers to eat fruit, vegetables and fish. Underlying pathways that partly explain the socioeconomic differences observed in fruit and fish intake are the barriers concerning the “high price” of fish and the “dislike” of fruit. The results of this thesis also indicate that the income differences in fruit and vegetable intake have widened over time. Underlying pathways that partly explain these changes in income difference in fruit and vegetable intake over time are the barriers concerning the “high price” of fruit and vegetables, and having “financial distress”.

The results of this thesis provide some starting points for the development of interventions and policies aiming to reduce socioeconomic differences in dietary intake in older adults. However, there is still a lot unknown. Future research should prioritize careful and throughout consideration of the underlying causes of SEP differences in healthy and unhealthy dietary intake. This is necessary to ensure that interventions and policies are tailored to the needs and capacities of the target population. It is important not to focus on individual factors only, but also on physical, socio-cultural and political factors. If this succeeds, the development and implementation of these interventions and policies should go hand in hand with careful scientific research that investigates if the interventions or policies lead to a decrease in SEP differences in dietary intake and consequently improves health in those subjects with a lower SEP. In addition, the intended and unintended impact of these interventions and policies on our food system and local and global economy should carefully be assessed, monitored and evaluated.