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## Food insecurity, dietary quality and health in the Netherlands

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### Citation

Velde, L. A. van der. (2022, March 1). *Food insecurity, dietary quality and health in the Netherlands*. Retrieved from <https://hdl.handle.net/1887/3277065>

Version: Publisher's Version

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**Note:** To cite this publication please use the final published version (if applicable).

# CHAPTER 8

## Summary

Social inequalities in health and dietary quality are found worldwide. To identify cues that might help reduce these inequalities, it is important to concurrently address social determinants of health such as food insecurity. Food insecurity is an elusive and multidimensional concept, which occurs when people lack consistent physical, social, or economic access to adequate food because of limited resources. Besides availability and access, feelings of worry and anxiety over food supply and the inability to acquire food in socially acceptable ways are also important components of food insecurity. These components have been incorporated into the definition used by the United States Department of Agriculture, stating that food insecurity is “the limited or uncertain availability of nutritionally adequate, safe foods or the inability to acquire foods in socially acceptable ways”.

Food insecurity is an important issue because it negatively affects health and dietary quality. Nevertheless, food insecurity is still a relatively neglected issue in Europe. In the Netherlands, research into food insecurity remains scarce but as the prevalence of food insecurity and its consequences differ between and within countries, regions, and populations, it is especially important to improve our understanding of the situation in the Netherlands.

The overall aim of this thesis was to gain a clearer picture of the prevalence of food insecurity in the Netherlands and its consequences for dietary quality and health. The studies included in this thesis provide potential targets for interventions aimed at reducing food insecurity among affected people and families in the Netherlands.

## Main findings of this thesis

While food insecurity has previously been shown to be associated with obesity, the explanatory factors underlying this association are less clear. The study presented in **Chapter 2** therefore explored potential explanatory factors by conducting mediation analyses, which involved describing the association between food insecurity and obesity and potential mediation by sociodemographic and lifestyle factors. The findings indicated that food insecurity was associated with obesity but not with overweight, and that the food insecurity-obesity association was partially mediated by living situation, dietary quality, and smoking status.

Improving health among disadvantaged groups and an ability to identify those most at risk of poor health has great potential for improving population health. Population

health management is an emerging concept that aims to improve population health and includes effective risk stratification: identification of populations that are most at risk of poor health. Risk stratification and explaining poor health based on traditional risk factors and social determinants of health (such as employment status, educational level, and income) often yields disappointing results, indicating that less traditional social determinants of health, such as food insecurity, might be worth considering for these purposes. In **Chapter 3** we therefore explored the value of assessing food insecurity and adding this to traditional social determinants of health when explaining poor physical and mental health: food insecurity was indeed a strong predictor of poor physical and mental health. Our results further indicated that food insecurity was of added value beyond traditional socioeconomic risk factors (i.e., age, educational level, income, living situation, employment, migration background): explained variance improved by approximately one-half for physical health and doubled for mental health. This information can contribute to effective risk stratification (by identifying populations at increased risk of poor health) and to providing targeted interventions to improve their health.

Advancing our understanding of factors that influence eating behavior among people at risk of experiencing food insecurity is essential when developing targeted interventions to support this population. **Chapter 4** presents narratives of people at risk of experiencing food insecurity, using a qualitative approach to gain a better understanding of the needs and perceptions regarding healthy eating behavior among this target group. The results of this study suggested that participants possess adequate nutritional knowledge; nevertheless, participants reported various social, environmental and financial barriers to healthy eating behavior, including poor mental health, financial stress, high food prices, and an unfavorable food environment. This chapter offers some initial suggestions for interventions that may help improve eating behavior in this vulnerable population. These suggestions include lowering the price of healthy foods and improving the food environment, as high prices of healthy foods and an unfavorable food environment characterized by an abundance of fast-food outlets were among the main perceived barriers for healthy eating articulated by our participants.

In **Chapter 5**, we further explored the influence of the food environment as a barrier for healthy eating among people at risk of experiencing food insecurity. In this study, we assessed the interplay between fast-food outlet exposure, household

food insecurity, and dietary quality in disadvantaged districts in the Netherlands. The results of the study presented in **Chapter 5** indicated that experiencing food insecurity was associated with lower dietary quality, and that this association was moderated by fast-food outlet proximity: stratified results revealed that the adverse effect of food insecurity on dietary quality was more pronounced for those with the nearest fast-food outlet located closer to home. The results also showed that increasing fast-food outlet distance (i.e., increasing distance between the fast-food outlet and the participants' home) was associated with a slightly higher dietary quality (indicating that maintaining a healthy diet may be easier when living further away from a fast-food outlet), whereas no association was found between fast-food outlet density and dietary quality. Our study contributes to the growing body of literature focused on the influence of the neighborhood fast-food environment on food insecurity and dietary quality. Taken together, this indicates that improving dietary quality by promoting healthier food environments may be especially important in areas with high percentages of food insecure households, as people experiencing food insecurity are most affected by their food environment, and because food insecurity and a high prevalence of fast-food outlets generally cluster within neighborhoods.

The role of financial barriers in explaining dietary quality is elaborated on in **Chapter 6**. In this study, we aimed to assess whether extending the Theory of Planned Behavior (TPB) - one of the most commonly used models for understanding health behaviors such as dietary behavior - by adding barriers related to financial scarcity and food insecurity better explains dietary quality. Our findings indicate that compared to the traditional TPB, the extended TPB (including financial scarcity and/ or food insecurity) showed best model fit and best explained variance in dietary quality, highlighting the importance of taking finance-related barriers for healthy eating into account when seeking a better understanding of individual dietary behavior in populations with a lower socioeconomic position. As the literature on psychosocial factors explaining differences in dietary intake is still relatively scarce, our study represents a substantial contribution to addressing this gap in current research

## Conclusion

Based on this thesis, we can conclude that a considerable number of people in the Netherlands experience food insecurity. The findings described in this thesis provide insight into the consequences: food insecurity is associated with obesity,

poor physical and mental health, and poor dietary quality. Our results also illuminate the role of sociodemographic and lifestyle factors, psychosocial factors and the food environment in these associations. In addition, our findings offer a clearer understanding of the perceived needs, perceptions and barriers regarding healthy eating among people at risk of experiencing food insecurity, as well as suggesting potential interventions. This thesis has shown that the issue of food insecurity needs to be better recognized and addressed in the Netherlands, for example through the development and implementation of population-based and risk group-based interventions for which appropriate screening and targeted interventions should be further explored.



