PhD Candidate's contribution to each article in the thesis

The PhD candidate conceptualized all articles in this thesis along with PhD supervisors. For the second chapter in this thesis which is a systematic review, PhD candidate was involved in retrieving the relevant articles for this review and writing of the systematic review. For the third and fourth chapter in this thesis, PhD candidate was involved in data collection, data analysis, helped in developing the questionnaire and wrote the paper. For the fifth and sixth chapters in this thesis, PhD candidate carried out the data analysis and wrote the paper.
Summary

Introduction

Cardiovascular diseases (CVD) are the leading cause of death in world among all communicable and non-communicable diseases. South Asian countries have one of the highest prevalence of cardiovascular disease. South Asians living in western countries have shown higher prevalence of cardiovascular disease as compared to other ethnic groups. In addition, South Asians have highest risk for developing CVD at a younger age as compared to other ethnic groups. Diet is an important lifestyle factor contributing to the increased risk of cardiovascular disease. The traditional Asian diet generally consists of high fibre and healthy foods like fruits, vegetables, rice, beans, meat, legumes, fish and nuts; though it varies by region within Asia. Migration and acculturation are associated with changes in chronic disease patterns [24]. The existing literary evidence points to unfavourable dietary change among South Asians after migration to western countries and thus an elevated risk of coronary heart disease and diabetes type 2.

Main contents of the thesis

In this thesis we primarily looked at cardiovascular disease and related risk factors and change in dietary habits of Pakistanis and South Asian Surinamese after migration to the Netherlands. In addition, we also looked at ethnic differences between immigrant Pakistanis in the Netherlands as compared with the local Amsterdam population and between South Asian Surinamese and Javanese Surinamese regarding diet and cardiovascular related risk factors.

Chapter 2 is a systematic review about the gender and ethnic differences regarding the prevalence of CVD related risk factors among the indigenous and immigrant Pakistani communities. The inclusion criteria was that we included Pakistani population or population of Pakistani origin and study focused on adults (18+). Studies related to East Pakistan (former part of Pakistan) were excluded. The results showed that CVD accounts for 34% of all deaths in Pakistan and prevalence of diabetes in adults is 6.9% while the prevalence of obesity varies from 27- 42% in adults in Pakistan. Similarly the results showed that women have higher prevalence
of central obesity than men and there were profound ethnic differences regarding prevalence of 
obesity, diabetes and hypertension. The results also showed that immigrant Pakistanis have 10- 
20% higher prevalence of obesity than indigenous Pakistanis.

Chapter 3 describes the dietary intakes among Pakistanis living in the Netherlands with research 
questions related to the intake of foods relevant for cardiovascular disease and the changes in the 
dietary habits of Pakistani immigrants living in The Netherlands after migration from Pakistan. 
The study was cross sectional with data collection carried out in 2012-2013. We had a sample 
size of 154 with 110 men. Data was collected through the completion of a questionnaire about 
diet and health. Pakistanis reported high prevalence of cardiovascular disease and related risk 
factors. In terms of food intake Pakistanis reported lesser intake of fruits and vegetables than the 
recommended amounts. A large number of Pakistanis reported frequent intake of dairy products. 
In addition, a large number of Pakistanis reported drinking tea with sugar and soft drinks with 
sugar. Pakistanis reported an increase in the consumption of raw vegetables, vegetables, 
convenience foods, fruits, soft drinks/soda, dairy products and white meat and a decrease in the 
intake of food items like high fat/fried foods, deserts/candy/sweets, red meat and they also 
reported decrease in dining out after migration to the Netherlands.

Chapter 4 explores dietary acculturation among South Asian Surinamese living in the 
Netherlands with the objective to test Koctürk’s model of dietary change among South-Asian 
Surinamese in the Netherlands. The model categorizes food into staple (rice, roti), 
complementary (red meat, vegetables) and accessory (sweets, fruits) foods and postulates that 
dietary change after migration begins with accessory foods while foods associated with ethnic 
identity (staple foods) change at a slower rate. We used cross-sectional data from the HELIUS 
study. Dietary intake was assessed with ethnic specific FFQ’s. Acculturation was based on social 
contacts and sense of belonging and was translated into four strategies of acculturation: 
assimilation, integration, separation and marginalization. Other indicators of acculturation 
included residence duration, age of migration and migration generation status. HELIUS was a 
prospective cohort study and data collection started in January 2011. We had a sample size of 
968 South-Asian Surinamese and 1456 Dutch participants. Results showed that across all 
acculturation strategies, South-Asian Surinamese participants reported significantly higher
intakes of rice (staple food) and chicken (complementary food) and significantly lower intakes of red meat and vegetables (complementary food) and cookies and sweets (accessory food) than Dutch participants. Men, second generation and assimilated South-Asian Surinamese were inclined towards Dutch foods such as potato, pasta and red meat. Accessory foods like fruits showed variation across acculturation strategies.

Chapter 5 describes comparison of general health status, myocardial infarction (MI), obesity, diabetes and fruit and vegetable intake between immigrant Pakistani population in The Netherlands and the local Amsterdam population. A health survey was conducted in 2012-2013 among Pakistanis in The Netherlands. Results were compared with a health survey conducted among inhabitants of Amsterdam in 2012. 154 Pakistanis from four big cities of the Netherlands and 7218 inhabitants of Amsterdam participated. The data for Amsterdam population was weighed on the basis of age, gender, city district, marital status, ethnicity and income level while the data for Pakistanis was weighed on the basis of age and gender to make both datasets representative of their general population. Pakistanis reported a significantly higher prevalence of MI, diabetes, overweight and obesity after controlling for age, sex and educational level with Amsterdam population as the reference group. Pakistanis showed a higher intake of fruit and fruit juice and lesser intake of cooked vegetables as compared to Amsterdam population.

Chapter 6 compared the prevalence of cardiovascular risk factors and dietary intakes between Javanese Surinamese and South-Asian Surinamese living in Amsterdam, the Netherlands. Data of the HELIUS (Healthy Life in an Urban Setting) study was used, including 2935 Surinamese participants (197 of Javanese and 2738 of South-Asian origin), out of which 1160 participants (78 Javanese and 1082 South-Asian) additionally reported dietary intake data. Descriptive statistics were used to compare the two ethnic groups regarding cardiovascular risk factors and dietary intake. Binary logistic regression analyses were used to adjust for age and sex. South-Asian Surinamese had significantly higher prevalence of abdominal obesity, cardiovascular disease and diabetes as compared with Javanese Surinamese after adjustment for age and sex. Javanese Surinamese had significantly higher intake of red meat and a significantly lower intake of dairy products as compared with South-Asian Surinamese.
Chapter 7 is general discussion about the findings of this thesis and also reflects on these findings keeping in mind the strengths and limitations of the study designs. In addition, implications for research, prevention and policy have been discussed along with future recommendations.

**Conclusion**

In conclusion South Asians subgroups such as Pakistanis, South Asian Surinamese and Javanese Surinamese showed high prevalence of cardiovascular disease and related risk factors. In addition, Pakistanis and South Asian Surinamese showed certain unfavourable changes in diet after migration such as decrease in the intake of vegetables and increase in the intake of soda and dairy products. The ethnic differences between South Asian Surinamese and Javanese Suriname regarding dietary intake and prevalence of cardiovascular diseases related risk factors were exhibited. South Asian Surinamese had higher prevalence of cardiovascular related risk factors and lesser intake of vegetables and higher intake of dairy products as compared to Javanese Surinamese. In addition, immigrant Pakistanis living in the Netherlands showed higher prevalence of cardiovascular related risk factors and fewer intakes of vegetables as compared to local Amsterdam population.
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About the Author

Qaisar Raza was born on 2nd of November 1983 to a lawyer (father) and to a housewife (mother) in a small and underdeveloped town called Bahawalpur in Pakistan. After completing his high school, he moved to a bigger and more industrialized city (Faisalabad) in Pakistan for obtaining his bachelors and research masters in agriculture with specialization in food technology and nutrition. During the research masters, the government of Pakistan, for the first time in the history of Pakistan, announced the overseas scholarship for doctoral studies. There were few scholarships and were very competitive but Qaisar got distinctive position in the exam for the scholarships and also did well in the interviews to get selected for a masters leading to PhD program in the Netherlands. In the Netherlands, a very exciting, challenging and adventurous experience was waiting for Qaisar. He started his academic journey in 2009 with masters in health education and promotion at Maastricht University and then got accepted for doing PhD at the department of health sciences at Free University, Amsterdam. After an intensive, challenging, exciting and fun time Qaisar has been able to produce this PhD thesis. Future endeavours include teaching, collecting further epidemiological data and developing dietary interventions about diet and non-communicable diseases from Asians inside Asia and also outside Asia.