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HIGH PREVALENCE OF NUTRITION RISK AMONG COMMUNITY LIVING OLDER PEOPLE IN WOERDEN, THE NETHERLANDS

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Abstract: *Background:* Undernutrition is a common problem in Dutch older people and may cause increased length of hospitalisation, early institutionalization and decreased quality of life. Nutrition risk precedes undernutrition and can be identified by timely nutritional screening. *Design:* This cross-sectional study aimed to examine the prevalence of nutrition risk among older people living in the community of Woerden. *Measurements:* Nutrition risk was assessed using a validated questionnaire: Seniors in the Community: Risk Evaluation for Eating and Nutrition, version II ('SCREEN II'). *Participants:* The sample (n=335, mean age 80, age range 75-85) were 32% men, 40% received home care and 46% lived alone. *Results:* Nutrition risk was present in two thirds (67%) of the respondents (38% 'at high risk', 29% 'at risk'). The most common SCREENII items that led to nutrition risk were a low intake of meat and alternatives (65%), milk products (59%), fruit and vegetables (59%) and eating alone (56%). Those who received home care were 1.8 times more likely to be at nutrition risk than people without home care (p=0.03) and those living alone were 3.3 times more likely to be at nutrition risk than those living with others (p<0.001). *Conclusions:* Intervention strategies are needed to encourage Dutch older people to take opportunities to eat meals with others and to improve their intake of major food group items. Training of home care staff to identify nutrition problems should be prioritised.

Key words: Nutrition Risk, The Netherlands, older people, SCREEN II, home care.

Introduction

Maintaining health and functionality in older people (>65y) is very important for the maintenance of independence (1). The Dutch government aims to keep older people healthy, to allow them to live independently as long as possible in the community with relatively little care (2). To achieve that objective, the government invests in home care staff. The Dutch population is aging, the number of older people will increase rapidly from 2013 (3). Those over 65 years are expected to increase from 2.7 million (16% of the entire population) in 2012 to a maximum of 4.7 million in 2041 (estimated to be 26% of the entire population). In the Netherlands the cost of living in an institution is estimated to be 6.000 to 16.000 euro per person per year more than living at home (4). Among older people who are in transition to move into an institution in the Netherlands the most important reason relates to a decrease in mobility (5). A large increase in institutionalized living older people is projected for those aged over 80 years (6).

Nutrition is an important determinant of health and functionality in older people (7). Poor nutrition, which refers to an inadequate, unbalanced diet (8) leads to undernutrition (9), which is associated with an increased length of hospital stay, early institutionalization (10), decreased quality of life (11) and may contribute to the development of disease (12). Undernutrition is related to long-term mortality in community dwelling as well as institutionalized older populations (13, 14) and is likely to cause an indirect increase in healthcare costs (10, 15).

Early recognition of undernutrition is important as nutritional intervention can reduce complications and further impairment of nutritional status (14, 16). Undernutrition is preceded by a state of nutrition risk, which can be identified by nutrition risk screening (17). Among Dutch older people almost a third (29.5%) is at risk of undernutrition in chronic care institutions (living, care and wellbeing institutions, mean age 83.6) and 22.7% are at risk of undernutrition in home care settings (mean age 79.0) (18). Using the SNAQ-criteria (Short Nutrition Assessment Questionnaire 65+), 9.2% of Dutch older people receiving home care were identified to be at nutrition risk compared to 7.7% without home care (mean ages 81.6 and 77.3 years, respectively) (14).

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The current prevalence of nutrition risk amongst independently living older people in The Netherlands is unknown. The aim of this study was to assess the prevalence of nutrition risk of community dwelling older people, identify common risk factor items and compare nutrition risk status of those with and without home care.

Methods

Participants

A cross-sectional study was undertaken amongst older people from the community of Woerden. Woerden is considered to be a typical community in The Netherlands on the basis of population structures such as age, gender, income, and nationality. Inclusion criteria for recruitment were age 75-85 years (born between 1929 to1939) and Dutch nationality. The sample size was set for 334 older people within the age range of 75-85 years, applying 95% reliability and 5% margin of error.

Participant recruitment

Participants responded to advertisements in two regional newspapers, through home care staff working in the community, by participant acquaintances and direct contact through arranged activities across the Woerden community for older people.

The Medical Ethics Review Committee (METC, UMC Utrecht) deemed the study to be of low risk and therefore an official approval of the study was not required under The Medical Research Involving Human Subjects Act (WMO) (reference number WAG/th/14/020125).

Data collection

Data collection was undertaken by a postal survey in April/May 2014. Participants completed a questionnaire sent to their private home (20.5%), in groups of people, facilitated by the activity arranging organisation 'Welzijn Woerden' (44.4%), by face to face interviews with the researcher (29.5%) or by email (5.6%).

The questionnaire

The questionnaire consisted of 23 items, 6 items for personal characteristics and home care, 3 items for evaluation of their acquaintance with the study and 14 items for an assessment of nutrition risk. Nutrition risk was measured using a Dutch translation of the validated questionnaire 'Seniors in the Community: Risk Evaluation for Eating and Nutrition, version II' (SCREEN II) with questionnaire items about weight change, food intake and risk factors for food intake. For each item the scores ranged from zero to four and the maximum score was 64. The total score was categorized as: 'not at risk' (score ≥54), 'at risk' (score= 50-53) or 'at high risk' (score ≤49) (19). Participants 'at risk' or 'at high risk' were referred to a physician or dietitian.

Statistical analysis

Descriptive statistics were completed for demographic items, living situation and professional home care data. The univariate associations between nutrition risk category and the variables gender, living situation and professional home care were tested by Pearson chi-square tests and odds ratios. Multivariate binary regression analysis was used to show whether the associations were maintained when all variables were included (gender, living situation and home care). Pearson Chi-square test was used to determine differences in nutrition risk items for participants who received home care versus who did not. P value below 0.05 was considered as significant. Statistical analyses were performed with SPSS 22.0 for Mac.

Results

Participant characteristics

There were 335 participants included in the study, with a mean age of 79.9 (± 2.96) years (Table 1). There were more women (68%) and fewer participants lived alone (46%) compared to the population of 2573 older people aged 75 to 85 living in Woerden (Table 1). A total of 40% of the participants received professional home care, which was similar to the Woerden community.

Table 1
Participants characteristics

	Respondents (n=335)	Woerden (n=2573[a])	P-value
Gender			
Female	67.8%	57%	
Male	32.2%	43%	
Total gender			0.026
Living situation			
Lives alone	46.3%	56.8%	
Lives with others	53.7%	43.2%	
Total living situation			0.026
Professional home care			
Yes	39.7%	32.5%b	
No	60.3%	67.5%	
Total prof. home care			0.137

a. On the 13th of May 2014, information about population obtained by contact with Town Council and includes people living in institutions (n=59); b. Based on the percentage of valid AWBZ indications in Woerden on the 1st of January 2013 and number of people who receive refund for help with domestic chores on the 27th of May 2014. AWBZ indications are statements for the right to receive chronic care (27).

Table 2
Nutritional risk groups according to SCREEN II by gender, living situation and professional home care

	Nutritional risk status (number and percentage)				
	At high risk	**At risk**	**Not at risk**	**Total**	**P-value**
Gender					
Female	91 (42.7)	59 (27.7)	63 (29.6)	213 (100)	0.026
Male	29 (27.6)	33 (31.4)	43 (41.0)	105 (100)	
Living situation					
Lives alone	83 (56.1)	37 (25)	28 (18.9)	148 (100)	<0.001
Lives with others	37 (21.8)	55 (32.4)	78 (45.9)	170 (100)	
Professional home care					
Yes	65 (50.8)	33 (25.8)	30 (23.4)	128 (100)	<0.001
No	55 (28.9)	59 (31.1)	76 (40.0)	190 (100)	
Total	122 (38.4)	91 (28.6)	105 (33.0)	318 (100)	

Table 3
The odds ratios[a] for gender, living situation and home care for those 'Not at risk' versus combined risk group)

Variable	Univariate model	P-value	Multivariate model	P-value
Gender (Female)	1.65 (1.01-2.69)	0.043	1.01 (0.59-1.74)	0.98
Living situation (Lives alone)	3.63 (2.18-6.05)	<0.001	3.31 (1.90-5.74)	<0.001
Home care (Yes)	2.18 (1.32-3.6)	0.002	1.8 (1.07-3.04)	0.028

a. Within the brackets, the 95% confidence intervals are displayed.

Table 4
The odds ratios[a] for gender, living situation and home care for those 'At risk' versus 'At high risk'

Variable	Univariate model	P-value	Multivariate model	P-value
Gender (Women)	1.76 (0.97-3.19)	0.063	1.08 (0.55-2.13)	0.82
Living situation (Lives alone)	3.34 (1.89-5.89)	<0.001	2.96 (1.59-5.51)	0.001
Home care (Yes)	2.11 (1.21-3.69)	0.008	1.76 (0.98-3.15)	0.057

a. Within the brackets, the 95% confidence intervals are displayed.

Nutrition risk

Nutrition risk status was assessed in 335 participants. For 17 respondents (5.1%) a score could not be assigned due to missing data. Using the SCREEN II questionnaire 38.4% of the respondents were 'at high risk' (SCREEN II score ≤49), 28.6% were 'at risk' (SCREEN II score 50-53) and 33.0% were 'not at risk' (SCREEN II score ≥54) (Table 2). Half (50.8%) of the older people who received home care were 'at high risk' compared to 27.7% of people who did not receive home care. Participants more likely to be at high nutrition risk were of female gender (p=0.026), living alone (p<0.001) and receiving professional home care (p<0.001). (Table 5).

Participants in the categories 'at risk' and 'at high risk' were combined for further analysis. Significant univariate associations were observed for living situation and home care (Table 3). People living alone were 3.31 times more likely to be at risk than people living together. People who received home care were 2.18 times more likely to be at risk than people who do not receive home care. In the multivariate model (Table 4) the association between living alone and high nutrition risk persisted (controlled for gender and home care). The univariate associations between the variables gender and home care and nutritional risk were not maintained in the multivariate model.

Figure 1 shows the frequency of SCREENII nutrition risk items for those at risk. The six main nutrition risk items were low meat and alternatives intake (65.1%), low milk product intake (59.4%), low fruit and vegetable intake (58.5%), eating alone (55.7%), perception of own weight and difficulty cooking (both 42.5%).

Figure 1
Nutrition risk items for participants at nutrition risk

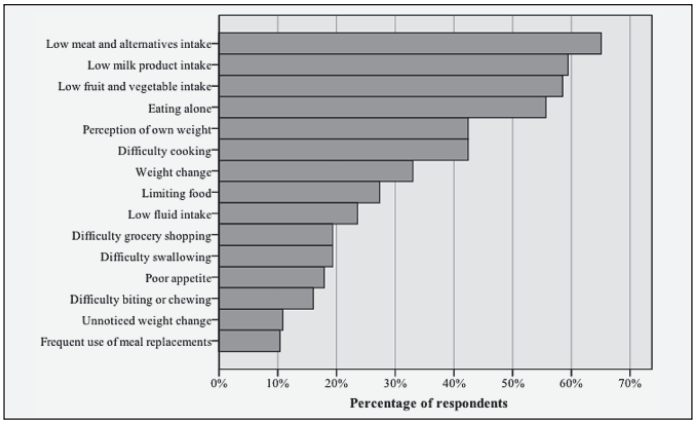

Table 5 shows nutrition risk items for people who do and don't receive home care. Those who receive home care are significantly more often at risk for eating alone, weight change, difficulty with grocery shopping, poor appetite, frequent use of meal replacements and unnoticed weight change.

Table 5
Nutrition risk items[a] for respondents in the combined risk group who do and don't receive professional home care

	Without home care	With homecare	P-value
Low meat and meat alternatives	34.0%	31.1%	0.5
Low milk product intake	34.9%	24.5%	0.08
Eating alone	25.0%	30.7%	0.004
Low fruit and vegetables	28.7%	29.7%	0.12
Difficulty cooking	21.2%	21.2%	0.34
Perception of own weight	21.7%	20.8%	0.54
Weight change	13.7%	19.3%	0.01
Limiting food	17.4%	9.9%	0.07
Low fluid intake	13.7%	9.9%	0.5
Difficulty swallowing	9.4%	9.9%	0.48
Difficulty grocery shopping	6.1%	13.2%	0.002
Poor appetite	7.1%	10.8%	0.05
Difficulty biting or chewing	7.5%	8.5%	0.39
Frequent use of meal replacements	2.8%	7.5%	0.008
Unnoticed weight change	2.8%	8.0%	0.005

a. SCREEN II items with scores less than or equal to two out of a maximum of four potentially lead to nutrition risk (19)

Discussion

This is the first Dutch study to identify the prevalence of nutrition risk among older people in the community using SCREEN II. Amongst people in Woerden over a third (38.4%) were at high nutrition risk. Previously, Schilp et al. (2012) identified 7.7% of older Dutch community dwelling people were at nutrition risk using SNAQ65+-criteria. The discrepancy in nutrition risk prevalence may be due to differences in measures employed by the screening tools. The SNAQ65+ was validated by 6/15 year-mortality risk (20) and the SCREEN II is validated against the criterion of a dietitians clinical judgement of risk (Keller et al. 2005). The AUC ('area under the curve') of the SNAQ65+ was overall poor (55%) because people die of various other reasons than undernutrition (20). The AUC for SCREEN II was 82% and has been shown to have high inter-rater and test-retest reliability as well as excellent sensitivity and specificity in detecting malnutrition (19). The SCREEN II tool has also been identified to be more suitable for use in community dwelling older people compared to the SNAQ in general (21).

Nutrition risk items such as low intakes of meat and alternatives), milk products fruit and vegetables and eating alone found in the present study, are commonly occurring risk factors (17, 22). Low intake of fruit and vegetables and milk products has previously been reported in the Dutch National Food Consumption Survey Older Adults 70+ 2010-2012. Also, the survey concluded that Dutch older people (mean age 77.5) consumed less meat compared to people in their fifties or sixties (23). Meat and milk products provide over half (53%) of the dietary protein for Dutch older people. Dietary protein is important for preserving bone and muscle mass in older adults (24).

Half (50.8%) of older people who received home care in Woerden, were at high nutrition risk. Similarly using the MNA (Mini Nutritional Assessment) other European studies, from Finland and Germany, reported half of older people receiving home care were at nutrition risk (25, 26). Home care is indicated for people who have a functional disability (27). People with functional disabilities have an increased risk of undernutrition and the dietary intake of energy protein and vegetables may be lower than those without impaired function (23). A low intake of major food group items in those with and without home care in this study suggests those living in the community need to be screened for nutrition risk and provided with appropriate nutrition support.

In this study people who lived alone and received home care were the most nutritionally vulnerable and are an easily identifiable group. Using SCREEN II, previous studies also indicate that living alone is associated with nutrition risk among older people in Canada (28), Sweden (29) and New Zealand (17, 30). Older people living alone usually eat less than those who have the opportunity to share their meals (31).

The cross sectional design of this study does not allow us to comment on causality in factors related to nutrition risk and the findings should be interpreted cautiously. The participants involved in this study were representative of the population in Woerden on the basis of age, gender and living situation. Therefore, the findings are indicative of the nutritional risk

status among older people in communities within The Netherlands. The validity of the SCREENII tool might be questionable from translation to Dutch. Although the tool was checked for comprehension, it is recommended that the SCREENII tool is validated for Dutch older people. As the SCREENII tool is suitable for self-administration and identifies nutrition risk factors screening for nutrition risk in community living older people could be cost-effective. The Dutch government has invested in a in a four-year program called 'Visible link', for employment of home care staff in order to keep older people living at home (32, 33). If the prevalence of nutrition risk remains unchanged, the absolute numbers of undernutrition in Dutch older people who receive home care will increase. The development of an intervention to prevent nutrition risk through home care staff could be effective to diminish nutrition risk. Another possibility is implementation of a digital version of SCREEN II, an intervention already active in Canada, known as Nutri-eScreen© (34). This e-version of the nutrition questionnaire provides feedback on which risk factor items are in need for improvement and could be very useful for older people and their carers for early identification of nutrition risk.

This study concludes that there are relatively high levels of nutrition risk among older community dwelling Dutch people aged 75 to 85 years living in Woerden. A low intake of essential food groups have been identified as important risk factors items. In order to maintain the independence of the older population it is recommended that older people are screened regularly for nutrition risk and, where necessary, effective nutrition intervention is provided.

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