The Journal of Nutrition, Health & Aging©
Volume 12, Number 10, 2008

PATTERNS OF HEALTHY LIFESTYLE AND POSITIVE HEALTH ATTITUDES IN OLDER EUROPEANS

K. KOZŁOWSKA[1], A. SZCZECIŃSKA[1], W. ROSZKOWSKI[1], A. BRZOZOWSKA[1], C. ALFONSO[5], C. FJELLSTROM[2], C. MORAIS[5], N.A. NIELSEN[3], C. PFAU[6], A. SABA[4], B. SIDENVALL[2], A. TURRINI[4], M. RAATS[7], M. LUMBERS[8], THE FOOD IN LATER LIFE PROJECT TEAM[9]

1. Department of Human Nutrition, Warsaw University of Life Sciences (SGGW), 02-781 Warsaw, Poland; 2. Department of Public Health and Caring Sciences, Uppsala University, 75183 Uppsala, Sweden; 3. MAPP Centre, The Aarhus School of Business, 10 8210 Aarhus, Denmark; 4. Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione, 546 00178 Rome, Italy; 5. Faculty of Nutrition and Food Sciences, Porto University, 4300-465 Porto, Portugal; 6. Federal Research Centre for Nutrition, D-76131 Karlsruhe, Germany; 7. Food, Consumer Behaviour and Health Research Centre, University of Surrey, Guildford, Surrey, GU2 7XH, UK; 8. School of Management, University of Surrey, Guildford, Surrey, GU2 7XH, UK; 9. more details at www.foodinlaterlife.org. Corresponding Author: Katarzyna Kozłowska, PhD, Department of Human Nutrition, Warsaw University of Life Sciences (SGGW), Nowoursynowska 159c, 02-776 Warsaw, Poland; E-mail: katarzyna_kozlowska@sggw.pl

Abstract: *Objectives:* To determine (i) the extent to which recommended lifestyle healthy behaviors are adopted and the existence of positive attitudes to health; (ii) the relative influence of socio-demographic variables on multiple healthy lifestyle behaviors and positive attitudes to health; (iii) the association between healthy lifestyle behaviors and positive attitudes to health. *Design:* two distinct healthy behavioral measures were developed: (i) healthy lifestyles based on physical activity, no cigarette smoking, no/moderate alcohol drinking, maintaining a "healthy" weight and having no sleeping problems and (ii) positive health attitudes based on having positive emotional attitudes, such as: self-perceived good health status, being calm, peaceful and happy for most of the time, not expecting health to get worse and regular health check-ups. A composite healthy lifestyle index, ranging from 0 (none of behaviors met) to 5 (all behaviors met) was calculated by summing up the individual's scores for the five healthy lifestyle items. Afterwards, each individual's index was collapsed into three levels: 0-2 equivalent to 'level 1' (subjectively regarded as 'too low'), a score of 3 equivalent to 'level 2' ('fair') and 4-5 as 'level 3' satisfactory 'healthy lifestyle' practices. The same procedure was applied to the positive health attitudes index. Multinomial logistic regression analyses by a forward selection procedure were used to calculate the adjusted odds ratio (OR) with 95% confidence interval (95% CI). *Participants:* a multi-national sample consisting of 638 older Europeans from 8 countries, aged 65-74 and 75+, living alone or with others. *Results and conclusions:* maintaining a "healthy" weight was the most frequently cited factor in the healthy lifestyles index and therefore assumed to be the most important to the older Europeans in the study; positive attitudes to health were relatively low; participants achieved a 'satisfactory' level for healthy lifestyles index (level 3) more frequently than a satisfactory level for positive attitudes to health; having a satisfactory 'healthy lifestyle' was directly related to having a satisfactory level of positive attitudes to health based on the positive health attitudes index; income and geographical location in Europe appeared to be key predictors for meeting both the recommended healthy lifestyle factors in the index and having positive health attitudes however, the composition and nature of the study sample should be taken into consideration when considering the impact of the location on healthy lifestyles and attitudes to health across Europe.

Key words: Older people, lifestyle, health attitudes.

Introduction

Aging is a continuous process from birth to death, including physical, social, psychological, and spiritual changes dependent on genetic, environmental and lifestyle behaviors. The adoption of healthy lifestyle behaviors such as continued activity and active engagement with life can help to maintain physical and cognitive function, independence and quality of life (1, 2).

The US Department of Health and Human Services (2000) recommend regular exercise, smoking cessation, avoidance of excessive alcohol, proper nutrition, and age-appropriate immunization (as quoted by 1). There is considerable evidence that promotion of healthy behaviors for older adults offers the potential to improve health status and quality of life as well as reducing the cost of health care (1, 3). Of particular interest is the extent to which older people adopt healthy lifestyle behaviors singly or in combination and their associations with demographic characteristics (including pairwise associations between behaviors and other lifestyle-related health factors). There is limited research addressing the relationship between multiple lifestyle-related health behaviors or clusters and their demographic correlates. Socio-demographic variables known to affect attitudes towards healthy lifestyle behavior include age, gender, income and social networks among older populations. An understanding of the clustering patterns of multiple lifestyle-related health factors among older populations and importance of demographic variables might support efforts to reduce the incidence of chronic disease and improve long term

Received January 19, 2007
Accepted for publication August 3, 2007

management and health outcomes (4).

The objective of the present study was to obtain detailed information on the factors affecting the adoption of not just single, but multiple recommendations for a healthy lifestyle including an investigation into: (i) the extent of recommended lifestyle healthy behaviors in the older Europeans in the sample and the existence of positive attitudes to health; (ii) the relative influence of socio-demographic variables on multiple healthy lifestyle behaviors and positive attitudes to health; (iii) the association between healthy lifestyle behaviors and positive attitudes to health.

Subjects and methods

Data were collected across eight European countries (UK, Denmark, Germany, Italy, Poland, Portugal, Spain, Sweden) between April and November 2004 for the Food in Later Life EU project (QLK1-CT-2002-02447) on different aspects of food-related quality of life. The present study extracted and reanalyzed specific data including socio-demographic variables and healthy lifestyle behaviors across the older European sample population.

Sampling

A variety of purposeful sampling approaches was used to reflect the diversity of older populations; quotas were set for age and living circumstances but not for income or educational attainment. Participants were recruited from a variety of sources including general practitioner registers, health and leisure centers, medical schools, senior clubs, pensioner associations and other regional and national registers. In addition, techniques such as telephone recruitment and snowballing were also undertaken. The study did not depend on having a nationally representative sample in each of the participating countries. All volunteers were invited to participate in a screening procedure to check quotas for age (people aged 65-74; 75+) and living arrangements (free-living people, living alone or together with a spouse/partner/adult children) as well as ability to participate. People with extreme visual and/or hearing impairments were excluded.

Methods

A structured questionnaire was developed by researchers from each country, to ensure comparable data were obtained particularly after translation, including a special coding and scoring guide. The validated 36-item Short-Form Health Survey (SF-36), in the relevant language of the country, was completed by all participants in the study (5). This multipurpose short version SF-36 contained 36 items and gave an 8-scale profile of scores including physical and mental health measures.

Most subjects completed both questionnaires face-to-face with the assistance of a researcher. The remainder of the participants self-completed the questionnaires in their own homes for collection later. The responses were checked by the researcher to ensure there were no missing answers and to clarify participant queries.

For the purpose of the present study reported data on smoking habits, alcohol use, mobility, activities of daily living, sleep problems, use of health services, self-perceived health status, emotional problems and health expectations were used.

Behavioral measures

Two behavioral measures were developed: one to measure healthy lifestyle and the other to assess attitudes to health. The first measure sought information on the following behaviors: physical activity, smoking, alcohol consumption, bodyweight and sleep. The second measure sought to reveal a positive attitude towards health including self-perceived good health status, being calm, peaceful and happy for most of the time, not expecting health to get worse and regular health check-ups. All items of the behavioral measures were divided into bivariate categories classified as adherent to the health-related recommendations (with a score of "1") or not (with a score of "0"). A composite healthy lifestyle index, ranging from 0 (none of behaviors met) to 5 (all behaviors met) was calculated by summing up the scores of five healthy lifestyle items on which individuals met recommendations. Afterwards, each individual index was collapsed into three levels: a score of 0-2 (level 1) was subjectively described as 'too low', a score of 3 (level 2) was said to be fair and 4-5 (level 3) 'satisfactory' and evidence of a 'healthy lifestyle'. The same procedure was used to score the positive health attitudes index.

Statistical analysis

The distributions of variables were calculated as proportions of the population that adhered to each behavior of healthy lifestyles. Hereafter, we estimated the proportion of older people in each of the $2^5 = 32$ possible patterns of adherence/nonadherence for behaviors for five, four, three for which the subject met the recommendations.

Multinomial logistic regression analyses by a forward selection procedure were used to calculate the adjusted odds ratio (OR) with 95% confidence interval (95% CI) of healthy lifestyle index for all socio-demographic variables. In order to clearly examine the correlates of 'level 3' with recommended healthy lifestyle behaviors as a dependent variable, the "level 2" category was excluded from the model. In this analysis 'level 1' was the reference category.

The same statistical procedure was adopted for the positive health attitudes index.

Socio-demographic variables were treated as independent variables. All independent variables were modeled as dummies. Due to the fact that the Poverty Income Ratio (PIR) was highly correlated with educational levels ($Chi^2=136.2$ for $p\leq0.001$), only the PIR variable was included in further statistical analyses.

All statistical tests were performed using SPSS version 12.0.

A p-value of 0.05 or lower was taken as being significant.

Results

Subjects

The total sample consisted of 638 older Europeans. In each of the 8 countries, 40 men and 40 women (65-74; 75+ years) living alone or with others were recruited. The mean body mass index (BMI) calculated on the basis of self-reported weight and height was 26.03 kg/m2 (SD ± 4.86). A table summarizing the socio-demographic characteristics of the overall sample is presented in Table 1.

Table 1
Percentage distribution of socio-demographic characteristics of the study sample (n=638)

Socio-demographic variables	% (n)
GENDER	
Male	50.0 (319)
Female	50.0 (319)
AGE	
65-74 (younger)	50.2 (320)
75+ (older)	49.8 (318)
SOCIAL NETWORK	
Living alone	40.8 (260)
Living together	59.2 (378)
EDUCATIONAL LEVEL[1]	
No formal education or basic	34.0 (206)
Secondary	34.7 (210)
Higher	31.4 (190)
Missing data	5.0 (32)
POVERTY INCOME RATIO (PIR)[2]	
Low	55.4 (304)
Average	41.2 (226)
High	3.5 (19)
Missing data	13.9 (89)
SIZE OF RESIDENTIAL AREA	
Rural area (less than 20 000 inhabitants)	11.3 (72)
Town area (inhabitants from 20 000 to less than 100 000)	17.4 (111)
City area (inhabitants from100 000 to less than 500 000)	33.1 (211)
Metropolitan area (500 000 and more inhabitants)	38.2 (244)
GEOGRAPHICAL LOCATION IN EUROPE[3]	
Southern	38.1 (243)
Centrally-located	37.8 (241)
Northern	24.1 (154)

1. basic = less than primary school/primary school completed, secondary= secondary school completed and higher = college/university completed /post graduate degree completed; 2. PIR = the family's overall income (after tax) in 2004 per person and recoded as based on 2003 year national thresholds (per capita) into: low = below 1.5 times the national poverty threshold intermediate = 1.5 to less than 4 times the poverty threshold; and high = 4 times the poverty threshold [6]. National poverty threshold (per capita) was determined by EUROSTAT (2003) as at-risk-of-poverty threshold (60% of median equivalised income). Due to low frequency of high it was put together with average for further statistical analysis; 3. southern region = Italy, Spain and Portugal, centrally-located region = UK, Germany and Poland and northern region = Denmark and Sweden: according to the latitude similarities of participants' home.

Healthy lifestyle behaviors The average prevalence of five individual healthy lifestyle practices among older Europeans was almost 64%. As shown in Table 2, the prevalence of nonsmoking was the highest, whereas the prevalence of physical activity, no alcohol consumption and no sleep problems was somewhat lower. It is noteworthy that fewer than half of all participants were a 'healthy' weight. Table 2 shows the percentage of those who met recommendations for each possible number (from zero to five) of healthy lifestyle behaviors. Among the older participants, only 14% met all the five recommendations for a healthy lifestyle, although nearly 75% met recommendations for three and more items.

Table 2
The proportion of healthy lifestyle behaviors in the study population

No	Healthy lifestyle behaviors	% (n)
1	No cigarette smoking[1]	87.1 (556)
2	No (or moderate) alcohol drinking[2]	68.0 (434)
3	Having no sleeping problems	64.6 (412)
4	Showing physical activity[3]	60.2 (384)
5	Maintaining "healthy" weight[4]	37.6 (240)
	Healthy lifestyle score *	% (n)
	5	13.7 (85)
	4	30.7 (191)
	3	29.4 (183)
	2	19.1 (119)
	1	6.8 (42)
	0	0.3 (2)

1. never a smoker or ex-smoker at present; 2. no alcohol or less than 3 glasses of wine, beer or liquor a day; 3. physically active (e.g. walking, gardening, gym) 2-3 times per week or daily from 0.5 to 3 total hours per week; 4. body mass index (BMI) 18.5 – 25 kg/m2 [WHO, 1998]; * if there were 0-3 of data in the set of 5 behaviors, such cases were excluded; finally there were 16 such cases, therefore the total number does not sum up to n=638.

In terms of the most prevalent patterns of healthy lifestyle behavior it was found that 18% of the sample met all the healthy lifestyle recommendations although they were not of 'healthy' weight. However, the distribution of data was dispersed with the most prevalent combination for recommended guidelines being three and included non-smokers and no-alcohol users (5.0%), showing physical activity and maintaining "healthy" weight (4.6%) or nonsmoking and no sleeping problems (3%). (Note that not all data is shown in Table 2).

The multinomial logistic regression showed that the typology of men with average or high incomes living with a partner or adult relative in rural areas (inhabited by fewer than 20 000 people) of centrally-located or northern regions of Europe were most likely to reach a satisfactory level (3) of healthy lifestyle recommendations compared with other groups in the sample (Table 3). People living in rural areas were most likely to meet the recommended healthy lifestyle practices compared with any other independent variable; they were over four times more likely to meet recommendations for the satisfactory category (level 3) for healthy lifestyle behavior compared with those living in urban areas. The older men in the study were nearly twice as likely to attain very high scores for healthy lifestyles index compared with women. Those living in

Table 3
Comparison of healthy lifestyle behavior by age, location and living circumstance.

	Participants	Odds Ratio	CI (%)	range
Level 3 ("just right") healthy lifestyle behaviors	Living in rural area versus urban area	4.88	95	1.59 - 14.96
Extremely high healthy lifestyle behaviors	Men versus women	2.11	95	1.23 – 3.63
Level 3 ("just right") healthy lifestyle behaviors	Living in Southern versus other European regions	0.29	95	0.17 – 0.51
Level 3 ("just right") healthy lifestyle behaviors	Wealthy versus poor	2.90	95	1.63 – 5.15
Extremely high healthy lifestyle behaviors	Living with other(s) versus living alone	2.23	95	1.25 – 4.01

the southern European region were significantly less likely to fall into the category of 'satisfactory' compared with older Europeans from centrally-located or northern regions. By contrast, older wealthier individuals (with average or high incomes) were nearly three times more likely to have healthy lifestyle behaviors than those participants with low incomes. In addition, all the older people in the study living with other person(s) were nearly two times more likely to have highly scores for healthy lifestyles compared with those living alone.

Positive health attitudes

The average prevalence of five individual positive health attitudes among older Europeans was almost 58% (Table 4). Self perceived health was reported to be good by the majority of older people in the study and they also reported visiting their GP on a regular basis. Just over half of the sample met at least two of the five criteria for positive attitudes to health: being calm and peaceful and happy for most of the time. It was interesting to note that less than half did not expect their health to get worse. In particular, we found that among the older people in this study, only about 10% met recommendations for all five positive health attitudes with only 60% meeting recommendations for three and more. Looking at the distribution of positive health attitudes, 10% of older people expected their health to get worse in future and 6% of them did not see their a GP regularly, while still meeting all the other criteria for positive health attitudes. The most frequent combination of meeting recommended guidelines was self-perceived good health status and health check-ups (9%).

The results of the multinomial logistic regression for positive health attitudes demonstrated that the level of income (PIR) was once again an important predictor (Table 5): older people in a good financial situation were significantly more likely to meet a satisfactory number of criteria for positive health attitudes than older people on low incomes. Moreover, for those with a high score for positive health attitudes, findings indicated that geographical location was very important: the population sample living in southern European regions were less likely to have satisfactory positive health attitudes compared with those living in the central or northern regions.

In addition, the results of this study demonstrated that older people with very healthy lifestyles were more likely to report very positive attitudes to health compared with those whose healthy lifestyle behaviors were scored as low (OR=12.98; 95% CI, 6.70-24.09 – data not shown in a table).

Table 4
The proportion of seniors meeting positive health attitudes and criteria for positive health attitudes

No	Positive health attitudes	% (n)
1	Health check-ups[1]	74.7 (460)
2	Self-perceived good health status[2]	65.9 (409)
3	Being calm and peaceful for most of the time[3]	56.3 (346)
4	Being a happy person for most of the time[4]	53.7 (330)
5	"Not expecting my health to get worse"[5]	35.3 (213)
	Positive health attitudes score*	%
	5	9.8 (61)
	4	20.5 (128)
	3	29.0 (181)
	2	25.3 (158)
	1	13.1 (82)
	0	2.2 (14)

1. visit General Practitioner/Family Doctor regularly but < once/month; 2. being in excellent, very good or good health condition; 3,4. having such feelings during the past 4 weeks for all the time or most of the time; 5. this statement being definitely or mostly true; * if there were 0-3 of data in the set of 5 attitudes, such cases were excluded; finally there were 14 such cases, therefore the total number does not sum up to n=638

Table 5
Comparison between demographic variables and satisfactory attitudes to health

	Participants	Odds Ratio	CI (%)	range
Level 3 (satisfactory) for positive health attitudes	Wealthy versus poor participants	2.15	95	1.32 – 3.50
Level 3 (satisfactory) for positive health attitudes	Living in southern region versus other European regions	0.30	95	0.18 – 0.49

Discussion

The present study found some multiple healthy behaviors and health positive attitudes associations for selected socio-demographic variables (gender, living circumstances/social networks, PIR, size of residential area and the geographical location in Europe).

Although previous studies have examined patterns of healthy behaviors, direct comparison between these studies and the present one is difficult (4, 7, 8). Each of these studies assumed various healthy behaviors as baseline for further considerations, however, smoking, alcohol and exercise were often analysed.

The findings did not support a generalized picture of "healthy lifestyle and positive health attitudes" across all older Europeans, but educated men enjoying good incomes and living in rural households with other adults in central or northern regions of Europe presented a socio-demographic profile consistent with the adoption of healthy lifestyles.

Older males in the study tended to be better educated and wealthier than the women and this may be the reason that they were more convinced about the benefits of healthy lifestyles. Other studies have shown that level of education and income are associated with health behaviors (4, 7, 9, 10). Lee et al. (1) showed that older Koreans were engaged in approximately four health promoting behaviors (such as smoking cessation, alcohol abstinence, exercise, health check-up) were higher for men, younger seniors, and those with a higher educational level. Other studies have reported similar relationships in that lifestyle risk factors were higher among subjects with a lower educational levels, unemployed or living without a partner (for men only) who also had worse self-rated health and had reported their present health to be worse than a year earlier (11). In terms of lifestyles, older Spanish women led more sedentary lives, had a higher prevalence of obesity but lower prevalence of overweight than men. Alcohol and tobacco use were also higher among Spanish older men (10).

Environmental factors such as more open space, less traffic and greater exposure to nature appeared to result in rural living residents leading healthier lives compared with urban dwellers who led more sedentary lives and tended to experience weight gain (12).

Older people living with their spouse were more likely to adopt one another's healthy or unhealthy habits and it is noteworthy that Jurj et al. (13) found that the shared marital environment might contribute to similar lifestyle and morbidity patterns in spouses. In addition to the development of a similar lifestyle during marriage, people also tended to marry a person with similar constitution and health behaviors.

Adherence to five recommendations for health (physical activity, tobacco use, alcohol consumption, fruit and vegetable consumption, and dietary fat intake) varied according to race/ethnicity (7, 14). The results of HALE project showed that physical function of older Europeans was better in those living in the Southern European countries a finding in contrast with that of the present study. The discrepancy may be due to the fact that a more representative sample was obtained in the HALE project with more participants from southern countries (15).

The present study found an association between those achieving a satisfactory level of healthy lifestyle behaviors and participants who reported having positive attitudes to health. Lim et al. (16) found the most common barrier to people increasing physical activity as a single component of healthy lifestyle was the presence of health problems. Previous studies have also shown that the presence of healthy lifestyles was associated with the physical and mental status of participants (17, 18, 19, 20).

The socio-demographic profile of older Europeans presenting with satisfactory attitudes to health showed that regardless of gender, they were highly educated, with an average to high PIR living in centrally-located or northern regions of Europe. Thus income and region markedly affected markedly healthy lifestyles and positive health attitudes (21). Generally speaking, this finding was not surprising since many studies have confirmed the association between income and health (22, 14, 23, 24, 25, 34).

The results of the HALE project showed that psychological functioning of older European was favored the North. Even though the prevalence of depression was not investigated in the present study, we can make the assumption that positive health attitudes reflect the underlying emotional status of individuals indicating that the findings of the HALE project (15) were in line with those of the present study.

There is no doubt that the majority of older participants had problems with maintaining a "healthy" weight and this suggests that there is a need to develop more effective strategies to address weight problems among older Europeans. Obesity has become a global epidemic (26, 27) and is more common among middle-aged and older adults, people with little formal education, women, rural residents, and in certain ethnic groups such as Afro-Americans and Hispanics (28). In recognition of the contribution of behavioral factors to obesity, studies have investigated the differences in dietary intake and physical activity among different population subgroups (29). In general, studies reinforce the need for targeted guidelines for weight loss management linked to individual lifestyles using a multidisciplinary clinic-based weight management program consistent with sociodemographics (30).

Finally, it is noteworthy that most of the older Europeans reported expecting their health to get worse even though many of them were in the habit of having regular health check-ups which did not alleviate anxiety and pessimistic attitudes.

In terms of the limitations of studies including the present one, many have investigated a wide variety of different population sub-groups based on convenience sampling (which cannot be regarded as being fully representative). Furthermore, our study population was divided depending on geographical location in Europe to minimize the effect of relatively small national sample sizes. Secondly, other studies have included different health behaviors and protocols to categorize individual

health behaviors, making comparisons of observed patterns or clusters with other similar studies more difficult. Finally, the data were based on self-reported information where people often tend to underestimate their actual weight and alcohol consumption (29, 31). There is some evidence, however, that heavier people and heavier alcohol users tend to distort their answers more than people of normal weight or those who use alcohol moderately (32, 33).

However, the findings do warrant further study, using larger and more representative samples. Additional assessments of health behavior and further in-depth qualitative studies could support our findings, providing explanations regarding the observed disparities.

Conclusions

The older Europeans in the present study believed that maintaining a "healthy" weight was the most important of healthy lifestyle recommendations to meet. Positive attitudes towards healthy lifestyles were relatively low and reasons for this should be investigated in future studies. The majority of the study population had satisfactory lifestyle behaviors with respect to health which was not necessarily matched by having positive attitudes to health. However, the relationship between satisfactory levels of healthy behaviors and positive attitudes to health was acknowledged by the sample. Income and geographical location in Europe were predictors for meeting healthy lifestyle factors and having positive attitudes towards health.

Future implications

The findings indicate that strategies should be developed to help older Europeans to adopt healthy lifestyle behaviors by making them aware of proper dieting and persuading into being physically active, preferably for 20 minutes at least 2-3 times per week. Moreover, it seems important to try changing their emotional attitudes. As a consequence, an important target for national public health research and intervention studies should focus on correcting these problems.

Acknowledgements: We are grateful to all older people who took part in the study. This study has been carried out with financial support from the Commission of the European Communities, specific RTD programme "Quality of Life and Management of Living Resources", QLK1-CT-2002-02447, "Choosing foods, eating meals: sustaining independence and quality of life in old age". It does not necessarily reflect its views and in no way anticipates the Commission's future policy in this area.

Financial disclosure: none of the authors had any financial interest or support for this paper.

References

1. Lee T.W., Ko I. S., Lee K. J. Health promotion behaviors and quality of life among community-dwelling elderly in Korea: A cross-sectional survey. International Journal of Nursing Studies 2006; 43: 293-300.
2. Goldberg T., Chavin S. Preventive medicine and screening in older adults. Journal of the American Geriatric Society. 1997; 45: 341-354.
3. Beattie BL, Whitelaw N, Mettler M, Turner D. A vision for older adults and health promotion. Am J Health Promotion 2003;18(2):200-204.
4. Pronk N.P., Anderson L.H., Crain L., Martison B.C., O'Connor P., Sherwood N.E., Whitebird R.R. Meeting recommendations for multiple healthy lifestyle factors. Prevalence, clustering and predictors among adolescent, adult, and senior health plan members. Am J Prev Med 2004; 27(28): 25-33.
5. Ware J.E. Sherbourne CD. The MOS 36-Item Short Form Health Survey (SF-36). I.Conceptual framework and item selection. Med Care, 1992, 30, 473-483.
6. Goodman E. The role of socioeconomic status gradients in explaining differences in US adolescents' health. Am J Public Health 1999; 89: 1522-8.
7. Berrigan D, Dodd K, Troiano RP, Krebs-Smith SM, Barbash RB. Patterns of health behavior in U.S. adults. Pre Med 2003;36:615-623.
8. Soowon K., Popkin B., Siega-Riz A., Haines P., Arab L. A cross-national comparison of lifestyle between China and the United States, Rusing a comprehensive cross-national measurement tool of the healthfulness of lifestyles: the Lifestyle Index. Pre Med. 2004; 38(2): 160-171.
9. Redigor E., Barrio G., De La Fuente L., Domingo A., Rodriguez C., Alonso J. Association between educational level and health related quality of life in Spanish adults. J Epid Comm Health 1999;53:75-82.
10. Guallar-Castillon P., Sendino A.R., Banegas J.R., Lopez-Garcia E., Rodriguez-Artalejo F. Differences in quality of life between women and men in the older population of Spain. Social Science&Medicine 2005; 60: 1229-1240.
11. Schuit A.J., van Loon A.J.M., Tijhuis M., Ocké M.C. Clustering of lifestyle risk factors in a general adult population. Prev Med. 2002; 35: 219-224.
12. Shi H-J., Nakamura K., Takano T. Heath values and heath-information-seeking in relation to positive change of health practice among middle-aged urban men. Prev Med. 2004; 39: 1164-1171.
13. Jurj A.L., Wen W., Li H-L., Zheng W., Yang G., Xiang Y-B., Gao Y-T., Shu X-O. Spousal correlations for lifestyle factors and selected diseases in Chinese couples. AEP 2006; 16 (4): 285-291.
14. Scarcini I.C., Robinson L.A., Alfano M.S., Zbikowski S.M., Klesges R.C. The relatioship between socioeconomic status, ethnicity, and cigarette smoking in urban adolescents. Prev Med. 2002; 34: 171-178.
15. Bogers R., Tijhuis M., van Gelder B., Kromhout D. Final report of the HALE (Healthy Ageing: a longitudinal study in Europe) Project. RIVM report 260853003/2005.
16. Lim K., Stat M.A., Taylor L., M.B., B.S., M.P.H., F.A.F.P.H.M. Factors associated with physical activity among older people – a population-based study. Pre Med. 2005; 40: 33-40.
17. Chen X., Sekine M., Hamanishi S., Wang H., Gaina A., Yamagami T., Kagamimori S. Lifestyles and health-related quality of life in Japanese school children: a cross-sectional study. Prev Med. 2005; 40: 668-678.
18. Belloc NB, Breslov L. Relationship of physical health status and health practices. Prev Med. 1972;1:409-421.
19. Segovia J., Bartlett RF., Edwards AC. Health status and health practices- Alameda and beyond. Int I Epidemiol. 1991; 20: 259-63.
20. Ezoe S., Morimoto K. Behavioral lifestyle and mental health status of Japanese factory workers. Prev Med. 1994; 23: 98-105.
21. Contoyannis, P., Jones, A.M. Socio-economic status, health and lifestyle. Journal of Health Economics. 2004; 23 (5): 965-995.
22. Ecob R., Smith G.D. Income and health: what is the nature of the relationship? Social Science and Medicine. 1999; 48: 693-705.
23. Winkleby M.A. Jatulis D.E., Frank E., Fotrmann S.P. Socioeconomic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease. Am I Public Health. 1992; 82: 816-820.
24. van Doorslaer E., Wagstaff A., Bleichrodt H., Calonge S., Gerdtham U-G., Gerfin M., Geurts J., Gross L., Häkkinen U., Leu R.E., O'Donnell O., Propper C., Puffer R., Rodriguez M., Sundberg G., Winkelhake O. Income-related inequalities in health: some international comparisons. Journal of Health Economics 1997; 16: 93-112.
25. Yngwe M. Ä. Fritzell J., Berström B., Lundberg O. Comparison or comsumption? Distingushing between different effects of income on health in Nordic welfare states. Social Science & Medicine 2005; 61: 627-635.
26. Wang Y., Monteiro C., Popkin B. M. Trends of obesity and underweight in older children and adolescents in the United States, Brazil, China and Russia. American Journal of Clinical Nutrition 2002; 75: 971-977.
27. Zhang Q., Wang Y. Socioeconomic inequality of obesity in the United States: do gender, age, and ethnicity matter? Social Science & Medicine.2004; 58: 1171-1180.
28. Nothwehr F. Attitudes and behaviors related to weight control in two diverse populations. Prev Med. 2004; 39: 674-680.
29. Laaksonen M., Luoto R., Helakorpi S., Uutela A. Associations between health-related behaviors: a 7-year follow-up of adults. Prev Med. 2002; 34: 162-170.
30. Riebe D., Greene G.W., Ruggiero L., Stillwell K.M., Blissmer B., Nigg C.R., Caldwell M. Evaluation of a healthy-lifestyle approach to weight management. Pre Med. 2003; 36: 45-54.
31. Kuskowska-Walk A., Bergstrőm R., Bostrőm G. Relationship between questionnaire data and medical records of height, weight and body mass index. Int J Obesity Related Metabol Disorders 1992; 16:1-9.
32. Poikolainen K. Alcohol and mortality: a review. J Clin Epidemiol 1995; 48: 455-65.
33. Roberts RL. Can self-reported data accurately describe the prevalence of overweight? Public Health 1995; 109:275-84.
34. Brown P., Guy M., Broad J. Individual socio-economic status, community socio-economic status and stroke in New Zealand: A case control study. Social Science&Medicine. 2005; 61:1174-1188.