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DESCRIPTIVE DATA ON LIFESTYLE, ANTHROPOMETRIC STATUS AND MENTAL HEALTH IN ITALIAN ELDERLY PEOPLE

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Abstract: Objective: The objective of this paper is to provide descriptive information on anthropometric status, pathological conditions, cognitive impairment and lifestyle in apparently healthy elderly Italian people. Design, setting and subjects: In order to recruit the volunteers for the ZENITH study, 359 Italian participants (167 men and 192 women), aged between 70 and 85 years, free living in Rome, were selected. Volunteers underwent a full clinical examination, anthropometric measurements (height, weight), a lifestyle questionnaire and mental health assessment (cognitive impairment and depression). Results: The prevalence of overweight and obesity was high (57% and 22% in men; 43% and 27% in women). Obesity was associated with low socio-economic profile in about 40% of participants. Although the sample was selected by family doctors and was apparently healthy, after medical screening the presence of several pathologies, particularly diabetes in 21% of participants was observed. There was a low prevalence of cognitive impairment in 4% of men and 7% of women and possible depression in 9% of men and 19% of women. The lifestyle questionnaire showed that most of their time was spent in light activities such as reading, watching TV or playing cards and significant differences between sex and BMI categories were observed (P=0.000). Conclusion: The results confirm the increasingly sedentary lifestyle of modern populations and demonstrate the need for sensitive and individualised strategies to design appropriate health promotion and disease prevention programs for older adults.

Keywords: Elderly, lifestyle, physical activity, overweight, obesity.

Introduction

A major challenge today is to improve overall health and quality of life in older age groups. In Western societies, both the number and the proportion of older people - defined as aged 60 and over - have increased substantially in the past century, resulting in a much greater proportion of people surviving to older ages (1). According to the WHO 1998 (2), by 2025 there will be more than 800 million people over 65 in the world, two-thirds of them in developing countries: Greece and Italy have the highest proportion of older people (both 24% in 2000). Intrinsic and extrinsic factors affect quality of life and lifestyle. While longevity increases, chronic diseases and disability decrease quality of life and socio-economic changes in Western societies play an important role in health status determination. In searching for determinants of healthy aging, modifiable lifestyle factors have been investigated such as diet, physical activity, smoking and alcohol consumption, all of which are related to a better health status in older adults. Although the research on these factors focused initially on middle-age, there is now substantial and convincing support for the central importance of these factors for the health of the elderly (3, 4).

Underweight and obesity conditions are both important risk factors for severe diseases and disability in the elderly (5, 6). The prevalence of obesity is increasing in all age groups including older persons (7-9). The number of obese older adults has markedly increased partly because of an increase in the total number of older adults in the population. Overweight and obesity are a result of energy imbalance over a long period of time. The cause of energy imbalance for each individual may be due to a combination of several factors: individual behaviours, environmental factors and genetics, all contribute to the complexity of the obesity epidemic (10). Environment includes lifestyle behaviours such as dietary habits and the level of physical activity. Individuals tend to eat high-fat foods, and put taste and convenience ahead of nutrition. Also, most people do not get enough physical activity and several studies have shown that for older adults habitual activity is low, with a higher prevalence of overweight and obesity (11-14). Sedentary lifestyle has been identified as one of the most important causes of death in the American population (15) and the link between body weight and health risk is well known. Findings in gerontology and sport sciences have suggested that regular physical activity can help to maintain and enhance physical health; in addition, numerous studies have demonstrated the ability of increased physical activity to improve psychological well-being and reduce depression (16).

Psychological factors and depression may also influence eating habits especially in older individuals (17). As well known, cognitive impairment is a common finding in older people, as the prevalence of dementia increases with age; it is correlated with age, gender, level of education, physical
function, depression and social isolation (18-20). Depression is a common disorder in the over 65s, with severe depression affecting 1-3% and milder forms affecting 10-15% of this population group (21). While it is well known the influence of these factors on age-related decline in physical function of the elderly people, data on Italian elderly population are inadequate. The aim of this paper is to describe anthropometric status, lifestyle and cognitive impairment in an Italian elderly sample.

Materials and methods

In order to recruit the Italian volunteers for the European ZENITH project “Zinc Effects on Nutrient/Nutrient Interactions and Trends in Health and Ageing”, 359 participants aged between 70 and 85 years, free living in Rome were selected. For this recruitment, the Directors of the local Health Centres were contacted and two local municipalities with a high density of elderly participants were chosen. From a list of more than 6563 persons of suitable age for inclusion into this study, their family doctor screened their medical records for suitability for this study: 63% of them was excluded according to the exclusion criteria for pathologies of the ZENITH study (diabetes, inflammatory chronic pathologies, renal and hepatic insufficiency). Complete inclusion/exclusion criteria of ZENITH study were described elsewhere (22). The eligible participants were contacted by an introductory and explanatory letter showing objectives of the study and subsequently by telephone to arrange an appointment for a medical interview, a full clinical examination and anthropometric measurement. Respect to the total amount of 2424 suitable participants, 42% of them were not reachable, 41% of them refused to participate in the study, mainly for disinterest or because it was too much demanding. At the end 359 apparently healthy volunteers (167 men and 192 women) were selected. All participants were fully informed of the purpose of the study and gave their written informed consent. Data presented are based on this sample.

Participants underwent a complete clinical examination, anthropometric measurement, lifestyle questionnaire administration and mental health assessment.

Clinical examination

Information on personal medical and surgical history, the concomitant use of medication and nutritional supplements, were collected by a general interview. The clinical examination was performed by a doctor and included a complete clinical check-up, the measurement of blood pressure and heart rate. Blood pressure was measured in a quiet room after the participants were rested (23).

Anthropometric measurements

Anthropometric measurements (height, body weight) were performed in the morning in fasting conditions by the same skilled observer according to the standardized procedure (24).

Height was measured to the nearest 0.1 cm with a metallic portable measuring board (PROMES, Wageningen, The Netherlands). Body weight was recorded to the nearest 0.01 kg using a portable battery-operated weighing digital scale max 130 kgs (Soehnle, Murrhardt, Germany), regularly calibrated; each participant was barefoot and lightly dressed. Weight and height were used to calculate Body Mass Index (BMI, kg/m²), and consequently the prevalence of obesity and overweight, using the cut-off points proposed for adult population: underweight <18.5 kg/m²; overweight 25.0-29.9 kg/m² and obesity ≥ 30 kg/m² (25).

Lifestyle questionnaire

This questionnaire was administered to each participant by trained personnel and consisted of a package of questions specifically designed to obtain different information about personal data, educational level, working situation, smoking habits, alcohol consumption and physical activity.

The questionnaire was divided in three parts:

- the first part concerned sociodemographic variables such as age, sex, marital status, education (divided into four categories: no education, primary education, secondary education and tertiary education), living arrangement and occupation. The socio-economic profile has been determined by the job occupation before retirement and the educational level. Participants have been classified in three different levels (low, medium and high profile), on the basis of the jobs reported in Appendix 1. The housewives were classified on the basis of their educational level and/or profession of their husband.
- the second part concerned living habits, particularly smoking and alcohol use, and dietary habits. Tobacco exposure was divided into: never smokers, ex-smokers and current smokers. Alcohol consumption was divided in seven categories: every day, 4-6 times a week, 2-3 times a week, once a week, less than once a week, once a month, less than once a month, never.
- the third part concerned physical activities divided in sleeping/resting, home activities, activities at work and recreational activities engaged during the previous year. Recreational activities were divided in active or light (passive) activity: the former group activities included sports and walking, the second watching TV, reading and other passive activities (such as playing musical instruments, singing, playing cards or chess, knitting, computer).

This semi-structured questionnaire was developed and validated by the Northern Ireland Centre for Food and Health Research, University of Ulster, Coleraine. The Italian version of the questionnaire was translated into Italian by a company set up specifically for translation work and then back translated into English.
Cognitive impairment and depression

Cognitive impairment and depression were assessed by the Mini Mental State Examination (MMSE) (26) and 15-item Geriatric Depression Scale (GDS) (27). The MMSE is a 30-item cognitive scale that investigates orientation, attention, immediate and short-term recall, language and the ability to follow simple verbal and written commands. The MMSE possible score ranges from 0 to 30 and total score decreases as cognitive impairment increases: a score of 23 or less indicates a need for further assessment even of people whose low scores may be due to limited education (28-30). It has proven reliability (26,31,32) and discriminant (32), concurrent and construct validity (26). It has been translated and validated into Italian (33).

The Geriatric Depression Scale (GDS) was used to screen depressive symptoms and their severity in the elderly (27). The most common version in general geriatric practice is the 15-item version, derived from the longer 30-item questionnaire, with a dichotomous (yes/no) answer format (34). It was looked at the reliability of shorter version of the GDS and found it to be psychometrically as sound as the 30-item version, suggesting that the shorter scales are suitable for use as exclusion criteria; this is used in this context in the present study. The 15-item scale is highly correlated to the 30-item version (r=.88) suggesting that they are measuring the same thing. A number of studies reports evidence for the reliability and validity of the short forms of the GDS (34, 35). It is easy to administer, needs no prior psychiatric knowledge and has been well validated in many environments - home and clinical (36, 37). The Italian version of the 15-item GDS has been employed in a number of Italian studies in which it has proven reliability (38) and discriminant validity (39).

Statistical analysis

Statistical analysis was performed using a SPSS ® 9.0 for Windows (SPSS Inc., Chicago, IL, USA). The data were first tested for normal distribution by using the Shapiro-Wilk test for normality. Student’s t-test was used to compare the means between sexes, while differences among prevalence by sex, BMI categories and age were tested by the chi-square test. The P <0.05 level of significance was used for all data analyses. The analyses were conducted using the maximum number of subjects for whom data were available (N=359): this number decreases (N=355) in analysis by BMI categories, in which we have excluded the underweight volunteers.

Results

Although the sample was selected by family doctors and it was apparently healthy, after the medical screening we observed the presence of several pathologies age related in 21% of participants (23% of men and 20% of women ). Particularly, diabetes was the most common disease affecting 33% of them; inflammatory chronic pathologies were present in 16%, hepatitis in 12% and cancer in 6% of volunteers; moreover there was a prevalence in 33% of participants of other pathologies (data not shown).

Anthropometric status, cognitive impairment and depression

In Table 1 are reported physical characteristics of our sample by gender. There were no significant differences in the mean age between sexes (75.7±4.3 years for men and 75.1±3.9 years for women). The mean BMI was 27.9±6.5 kg/m² for men and 27.6±4.4 kg/m² for women, indicating an overweight status. Significant differences by gender in height and weight, but not in BMI were observed.

Table 1

<table>
<thead>
<tr>
<th>Physical characteristics of the sample by sex</th>
<th>MEN</th>
<th>WOMEN</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N°</td>
<td>167</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>75.7±4.3</td>
<td>75.1±3.9</td>
<td>NS</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>77.0±10.7</td>
<td>65.6±11.6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>167.4±6.2</td>
<td>154.0±5.7</td>
<td>0.0001</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>27.9±6.5</td>
<td>27.6±4.4</td>
<td>NS</td>
</tr>
</tbody>
</table>

Statistical analysis: mean ± SD, Student t-test between sexes; NS - not significant. BMI – Body Mass Index

Anthropometric status (BMI categories), cognitive impairment and depression are presented in Table 2. The prevalence of overweight and obesity was high (57% and 22% in men; 43% and 27% in women); only 2% of women were underweight. Significant differences between sexes were observed (χ² =9.41, P=0.03). Overweight for both sexes increased with age: the highest prevalence of overweight was found in the oldest volunteers (80-85 years), and in the same age group there were volunteers with the lowest prevalence of obesity (data not shown).

Cognitive conditions were good in our sample: in fact the Mini Mental State Examination (MMSE) showed the presence of cognitive impairment for only 4% of men and 7% of women (not significant) (Table 2). The mean score for the Geriatric Depression Scale (GDS) was higher in women (P=0.000), indicating a greater percentage of women with depression status (9% of men and 19% of women; χ² =6.62, P=0.01). Particularly, 8% of men and 17% of women had a possible mild depression (GDS score between 6-10), while only 1% of men and 2% of women had a severe depression (GDS score≥11). GDS scores seem not to be related to educational level, but there is a relation between depression and living status: most of depressed participants were widows who lived alone (39%). In women, depression increased with age (P=0.023) (data not shown). Depression status of participants was investigated in relation to BMI categories. The percentage of depressed participants was higher for overweight plus obese (16%) than normal weight participants (11%), but there were not significant differences among BMI categories.
Socio-demographic information

Socio-demographic information (education, socio-economic level, living status) for men and women respectively are presented in Table 3. About 50% of volunteers had an educational level corresponding to the secondary school. Men had a higher prevalence of tertiary education respect to women ($\chi^2 = 16.65, P=0.000$), while 1% of men and 6% of women have no education. When the socio-economic profile was evaluated by the association of educational level and job occupation, 33% of men and only 8% of women had a high profile ($\chi^2 = 35.02, P=0.000$). About 80% of normal body weight and overweight volunteers had a medium/high socio-economic profile (Figure 1). Among the obese volunteers about 40% have a low socio-economic profile (men $P=0.03$; women $P=0.002$). Regarding working situation, 95% of men and 67% of women were retired.

Regarding living arrangement (Table 3), there was a percentage of 28% of participants who lived alone (11% of men and 43% of women; $\chi^2 = 58.00, P=0.000$) and among them 68% were widows and 32% were single, separated or divorced; among those not living alone, 10% were widows, while 90% lived with a spouse. Regarding data on marital status, contrary to the findings in men, most of women were widows (38%) and lived alone: the highest percentage of them was found between 80-85 years (data not shown).
Smoking habits and alcohol consumption

Data on smoking habits and alcohol consumption are reported in Table 4. Regarding smoking habits, there was the same percentage of current smokers for men and women and this percentage decreased with age: among smokers, most of them smoked cigarettes and 34% of them smoked more than 10 cigarettes/day. Most of the participants (60% of men and 25% of women) have stopped smoking for a mean of 24±12 years (range 7-55 yrs) ($\chi^2=52.64, P=0.000$).

As expected from a Mediterranean population, alcohol consumption was represented mostly by wine consumption and the percentage of everyday alcohol consumers was 76% of men and 51% of women ($\chi^2=25.4, P=0.000$). For 7% of men and 11% of women alcohol consumption was weekly and for 5% of men and 8% of women was occasional. 12% of men and 30% of women did not drink alcohol. Wine consumption was accompanied by beer, particularly in the summer period, and/or spirits and/or liquor consumption. Beer was consumed mainly by women, while spirits and liquor by men (data not shown). Smoking habits and alcohol consumption do not appear to be significantly associated with overweight and obesity.

Dietary habits

Information about preparation of meals, eating alone, special diets and types of ready-made meals purchased are reported in Table 5. Obviously differences between sex were observed in preparation of meals: more women prepare their own meals ($\chi^2=199.08, P=0.000$), which are eaten in a social setting ($\chi^2=48.59, P=0.000$). The percentage of volunteers on special diet was 17% of men and 25% of women, no significant difference was found for both sexes across the age range. The most widespread diets cited were low-fat and low-salt, while low calories and weight reduction diets were rare. The percentage of women who were on specific diet decreased with age,

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**Table 4**

Smoking habits and alcohol consumption by sex, given as percentages of participants

<table>
<thead>
<tr>
<th></th>
<th>MEN (N=167)</th>
<th>WOMEN (N=192)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking habits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current smokers</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Past smokers</td>
<td>60</td>
<td>25</td>
</tr>
<tr>
<td>Never smokers</td>
<td>25</td>
<td>60</td>
</tr>
<tr>
<td><strong>Alcohol consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everyday</td>
<td>76</td>
<td>51</td>
</tr>
<tr>
<td>Weekly</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Occasionally</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Teetotal</td>
<td>12</td>
<td>30</td>
</tr>
</tbody>
</table>

$\chi^2$: Chi square

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Figure 1

Socio economic profile by BMI categories ($\chi^2=13.16, P=0.01$), given as percentages of participants (N=167 men and 188 women).
while the highest percentage of men on diet was found between 80–85 years (data not shown). No differences by sex were observed in the specific types of ready-made meals purchased, with frozen meals as the most popular among them.

**Physical activity**

The first section on physical activity deals with the number of hours sleep participants get both at night and during the day (Figure 2). Most participants reported sleeping for 6-8h each night; differences between sexes were observed in sleeping pattern during the day ($\chi^2 = 15.90, P=0.004$). Moreover has been compared the sleeping pattern of participants respect to BMI categories (Figure 2c and 2d). No differences in sleeping patterns at night have been observed according to BMI categories, while the percentage of obese volunteers that sleep during the day for more than 30 min was higher compared to normal body weight participants ($\chi^2 = 19.42, P=0.01$).

Physical activity at home was assessed by asking participants to state how often they carry out a number of everyday activities such as washing up, preparing food etc. There were differences in the hours spent on these activities between sexes with women about three times more active than men in household pursuits (23 hours/week vs 6.5 hours/week) (data not shown).

As a result of increased sedentary lifestyle in older adults, they were asked about the amount of television they watch. Figure 3 gives a breakdown by sex and by BMI categories. TV watching occupied most leisure time activity especially for women ($\chi^2 = 6.75, P=0.03$) and about 80% of obese subjects watched TV more than 3 hours/day.

Concerning recreational activities men reported more physical activities than women and walking for pleasure, playing cards and reading were the most commonly reported. Figure 4 gives percentages of participants that perform walking for pleasure during the previous month by sex and by BMI categories. No significant differences between sexes were observed, while this activity was carried out from 74% of normal weight, 66% of overweight and 54% of obese subjects and was daily performed only by 25% of obese compared to 47% of normal elderly ($\chi^2 = 15.90, P=0.04$).

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**Table 5**

Dietary habits by sex, given as percentage of participants

<table>
<thead>
<tr>
<th></th>
<th>MEN (N=167)</th>
<th>WOMEN (N=192)</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation of meals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>12</td>
<td>85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td>13</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>19</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasionally</td>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>46</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eating alone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>10</td>
<td>34</td>
<td>$\chi^2=48.59$</td>
<td>0.000</td>
</tr>
<tr>
<td>Often</td>
<td>3</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasionally</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>79</td>
<td>45</td>
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<tr>
<td><strong>Special diet</strong></td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>83</td>
<td>75</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of diet</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Low salt</td>
<td>19</td>
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<tr>
<td>Low fat</td>
<td>28</td>
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<td></td>
</tr>
<tr>
<td>Low calorie</td>
<td>19</td>
<td>11</td>
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<td></td>
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<tr>
<td>Weight reduction</td>
<td>14</td>
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<td>Other diets</td>
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<td></td>
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<td><strong>Type of ready meals</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Chilled</td>
<td>17</td>
<td>22</td>
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<tr>
<td>Frozen</td>
<td>48</td>
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<td></td>
</tr>
<tr>
<td>Canned</td>
<td>31</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2$: Chi square; NS: not significant
Figure 2
Sleeping pattern at night and during the day by sex and by BMI categories, given as percentages of participants (N=167 men and 188 women). Sleeping pattern at night (by sex and by BMI figure 2a and 2c, $\chi^2$ not significant) Sleeping pattern during the day (by sex figure 2b $\chi^2=15.54$, P=0.004, by BMI figure 2d $\chi^2=19.42$, P=0.01).
Figure 3
Hours spent in watching television during the day by sex (figure 3a $\chi^2=6.75$, $P=0.03$) and by BMI categories (figure 3b $\chi^2$ not significant), given as percentages of participants (N=167 men and 188 women).

Figure 4
Walking for pleasure by sex (figure 4a $\chi^2$ not significant) and by BMI categories (figure 4b $\chi^2=15.90$, $P=0.04$), given as percentages of participants (N=167 men and 188 women).
The aim of this work was to describe anthropometric status and lifestyle of a sample of 359 (167 men and 192 women) elderly not representative of the Italian population. We wish to emphasize that this group probably represents a specific group, because consists of people who volunteered to participate and have been selected by their family doctors. Moreover, considering that the starting sample was selected randomly and that literature data on healthy free-living elderly are relatively lacking, we think that the present study could provide further knowledge on this population group.

Our findings show that more than 75% of the elderly examined are overweight or obese and while overweight increased with age and was higher for men, obesity was more frequent in women, according to literature data (7). The anthropometric status of our elderly population was similar to that described by other population studies (14, 40-44). It is known that there are certain limitations in using BMI values for classifying obesity and overweight, particularly in the elderly (44). For example BMI cannot distinguish between the contribution to body weight and fat tissue and that of muscle, bone and water. This problem is more pronounced in elderly, who tend to experience a decline in stature and a redistribution of body fat from subcutaneous to intra-abdominal and intramuscular sites. In addition a moderate high BMI in the elderly can be considered a protective factor with regard to mortality, respect to younger population (45). As international recommendations suggest the use of the same cut-off points for both elderly and adults (25, 46), we have used them to stratify our group and to describe the possible association between anthropometric status and lifestyle.

Social factors are of importance to obesity in the aged for several reasons. Literature data show that the socioeconomic state is inversely related to the prevalence of obesity (47). In our study obesity was more associated with low educational level and low socio-economic profile confirming as these factors represent independent risk indicators of inadequate dietary habits in elderly populations.

Health status in the elderly is influenced by cognitive functions (16) which were good in our sample, in comparison to other epidemiological studies (17). Depression status observed in our sample was similar to data reported in other studies (21): only in 14% of participants there was a possible depression status. It may sometimes be a difficult diagnosis: causes may be result of environmental changes, as unemployment, increasing stress associated with modern living. In order to determine the major causes of depression, the relationship between depression and living status has been evaluated. Results showed that those participants who have chosen to live alone (single or separated/divorced) did not have a possible depression status, while participants who were widows and lived alone had higher depression scores. The percentage of possible depressed participants seems to be higher for overweight plus obese than normal weight participants. These findings demonstrate the influence of habitual living status on psychological status.

Pathologies were low in our sample, because it was screened by family doctors that have excluded 63% of participants, according to the exclusion criteria of the Zenith study. Although the sample was apparently healthy, a moderate prevalence of pathologies was observed, indicating that for some participants the family doctor does not represent the referent for health status. Among these pathologies, diabetes was the most frequent and in the elderly it is primarily the consequence of reduced physical activity and increased body weight (48).

A modifiable risk factor for disease in elderly is smoking. Previous studies have documented that older people who do not smoke have a lower risk of developing disability (49-51). Most of our volunteers had stopped smoking and although this factor has been observed for both sexes, it was greater for men than women (60% of men and 25% of women), confirming previous findings (52): the negative effects of smoking can be reversed through smoking cessation.

Physical activity declines with age and it has been estimated that decreased physical activity accounts for about one half of the decrease in total energy expenditure that occurs with age (53). Moreover there are some evidence that physically inactive adults are at increased risk of many metabolic disorders and several diseases (7, 54) and there are some studies on the association between different levels of physical activity and all-cause mortality among elderly people (55). Our results show that for this sample they engaged mostly in less strenuous activities such as reading, watching TV or playing cards and it confirms the increasingly sedentary lifestyle of modern populations: the large proportions of sedentary elderly were found in Portugal, Belgium, Greece and Italy (56). Moreover, there was a clear positive association between passive leisure and BMI: normal weight volunteers spent more time in simple activity such as walking for pleasure and sleep during the day less time than overweight and obese volunteers. These results confirm that physical inactivity can be a cause of overweight and obesity, a general phenomenon not related to age.

It being understood that we have selected a sample looking mainly healthy, non smoking and having low alcohol consumption, nevertheless it had an overweight or obesity status probably due to wrong dietary habits and moderate physical activity. In conclusion these findings, reflecting the trend of modern population, suggest the need by the health authorities to develop guidelines promoting the awareness of the benefits deriving from lifestyle factors, such as healthy diet and regular physical activity, which may prevent weight gain and obesity.

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HEALTHY AGEING IN ITALIAN PEOPLE

Appendix I 
Socio-economic profile

Job

Low profile: Worker; tailor; clerk; pump attendant; baby sitter; concierge; painter; nurse; cloakroom; railwayman; hair dresser; coach builder.

Medium profile: Employee; window dresser; craftsman; trader; telephonic assistant; military; model; taxi driver; social assistant; manicure; secretary; hospital attendant; building assistant; flight attendant; trade unionist; shop keeper; radiology technical; interior designer; business agent; teacher; barman.

High profile: Legal; pharmacist; entrepreneur; journalist; officer director; manager; doctor; engineer.

References