

## ORIGINAL RESEARCH

# Life-style activities in older people without intellectual impairment: a population-based study

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## ABSTRACT

**Introduction:** Activities of daily living are important indicators of the functional status and wellbeing of older persons. Data derived from life-style activities of the community at large are important for such diverse purposes as characterising the individual's ability for independent living, studying normal ageing, or investigating social factors in rehabilitation. Our objective was to determine patterns in the life-style activities of people aged 65 years and older who had no intellectual impairment.

**Methods:** The article is a cross-sectional study of a population-based sample. Eligible people were non-institutionalised and aged 65 years or older, resident in the province of Guadalajara, Spain, and without intellectual impairment as assessed by the 10-item Short Portable Mental Status Questionnaire. Questionnaires were administered by trained interviewers and included questions about the daily activities of the Adelaide Activities Profile (AAP), distributed among the four categories of domestic chores, household maintenance, service to others, and social activities. Each item was rated 0 = absent or 1 = present, and total scores ranged from 0 to 19.

**Results:** The sample included 192 men and 196 women from rural areas and 172 men and 220 women from urban areas. In the category of domestic chores, mean ratings for women (4.56, 95% CI 4.30 to 4.84) were significantly higher ( $p < 0.05$ ) than for men (1.36, 95% CI 1.11 to 1.62) both in urban and rural areas, except in the oldest age group ( $\geq 85$  years). In the subscale of household maintenance, also except for group of  $\geq 85$  years, men rated significantly higher (3.31, 95% CI 3.11 to 3.53) than women (2.34, 95% CI 2.21 to 2.47), independent of the place of residence. Women scored significantly higher than men in activities associated



with service to others. Men younger than 80 years from rural areas were significantly more involved in social activities than women. In urban areas both sexes scored similarly in social activities

**Conclusion:** The differences found among the AAP scales in relation to gender was a clear indication of the well established roles for men and women in our sociocultural context. The 19-item version of the AAP scale is a valuable survey instrument as an objective guide for studying activities related to life-style in community settings.

**Keywords:** activities of daily living, Adelaide Activities Profile questionnaire, elderly, life-style, Spain.

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## Introduction

Activities related to life-style have long been regarded as an important component of instruments for the functional assessment of older patients, as well as an outcome measure to monitor a patient's clinical course or response to healthcare interventions<sup>1</sup>. Unfortunately, several characteristics of assessment instruments can affect their sensitivity to change. In this respect, many that assesses a patient's ability to perform activities of daily living (ADL) address a very limited range of human performance<sup>2</sup>. In such cases, patients who function outside this narrow range can have clinically meaningful changes that go undetected. A frequent criticism is that ADL indices are of limited value in quantifying disability in individuals in the community, who inevitably score close to the upper limit of such scales<sup>3,4</sup>. Because ADL scales typically evaluate a patient's ability for self-care, other indices that more comprehensively embrace daily living activities or 'life-style' have been developed, among others the Functional Life Scale (FLS)<sup>5</sup> for the quantification of overall life function in the disabled, and the Frenchay Activities Index (FAI) for use with stroke patients<sup>6,7</sup>. In the Adelaide Activities Profile (AAP)<sup>8</sup>, four clusters of variables (domestic chores, household maintenance, service to others, and social activities), were chosen in order to provide a more comprehensive profile of the life-style activities of elderly people. Notably, the AAP taps a behavioural dimension not covered by other measures, and is appropriate for use with individuals in the community at large.

In the present study we compared elderly residents in urban areas with those who lived in rural areas in order to establish possible differences between environments.

A cross-sectional study was conducted with two purposes:

1. To determine patterns of activity associated with life-style in a population-based sample of people aged 65 years and older without intellectual impairment from the province of Guadalajara (Spain).
2. To assess the relationship between life-style activities in AAP scales and self-perception of overall daily activity, according to the home environment (urban or rural).

## Methods

Non-institutionalised people aged 65 years or older, resident in the province of Guadalajara, without intellectual impairment were eligible to participate in a cross-sectional population-based study, which was conducted in the primary-care setting. Intellectual impairment was assessed using the 10-item Short Portable Mental Status Questionnaire described by Pfeiffer<sup>9</sup> and final scoring was corrected by education level. The study was performed in Guadalajara, a province of central Spain, whose territory coincides geographically with one of the administrative areas of the national public health service. At the time of the study the population was notably aged and largely spread through the countryside. Of a total 413 population nuclei in the province, 52% was concentrated in two cities: Guadalajara



and Azuqueca de Henares. In the stratum of persons aged 65 years or over, 45.7% were men and 54.2% were women; 30.4% lived in urban areas and 69.6% in rural areas.

The sample size was calculated according to the formula for finite proportions with  $p = q = 0.5$  (the most unfavourable case with maximal variance) and  $\alpha$  and  $\beta$  levels of 5%. The size of the sample was increased by 26% according to the percentage of loss found in a previous survey among the urban population aged 65 years or over from Cuenca<sup>10</sup>. A total of 950 subjects were invited to participate in the study.

A random stratified-cluster probability sample by age, sex and population nuclei was drawn from the sample frame of households using 1991 census data. At the rural level, municipalities were classified into five strata according to the number of inhabitants. The final sample included 473 persons (228 men, 245 women) from rural areas (53 municipalities were represented) and 477 (210 men, 267 women) from urban areas. For the purpose of the study, losses included subjects who met the exclusion criteria, no responses (unwillingness to take part in the study or absence after repeated attempts at contact) and ineligibility (change of residence, inaccessibility to the research team or death)<sup>11</sup>.

Eligible subjects received a letter stating the purpose of the study, inviting them to participate. Subjects were then recruited by telephone. They were interviewed at home or at the primary care centre according to their preference. Questionnaires were administered by trained interviewers and included questions on daily activities of the AAP<sup>8</sup>, self-assessment of overall daily activity and demographic information (age, sex, civil status, family situation, educational and socioeconomic level, occupation and work status). The whole questionnaire was performed by these interviewers.

The set of activities of the AAP scale included 19 items distributed among four categories:

1. Domestic chores (preparing meals, washing clothes, light housework, washing dishes, household

shopping, heavy housework, making telephone calls).

2. Household maintenance (heavy gardening, light gardening, house/car maintenance, driving car, daily walking, hobbies).
3. Service to others (attending religious services, paid employment, caring for other family members).
4. Social activities (outdoor recreation, outdoor sport, social activities).

Each item was rated either 0 = absent or 1 = present. Total scores ranged from 0 to 19. Self-assessment of overall daily activity was measured on a four-point scale ranging from 'very intense', 'intense' and 'moderate' to 'none'.

Reliability of the questionnaire was analyzed in a subgroup of 40 subjects aged 65 years or over (20 men, 20 women) from semirural and urban areas, stratified by age and sex, and included in the study population, who were selected according to logistic criteria of proximity to the primary-care centre. Questionnaires were administered by the same person and repeated (re-test) at least 30 days after the initial administration. Table 1 shows the kappa statistics for items in the four AAP scales<sup>12</sup>.

### *Statistical analysis*

Data were analyzed using the SPSS (SPSS Inc; Chicago, IL, USA). Quantitative variables are expressed as mean and standard deviation (SD) and qualitative variables as percentages with the 95% confidence intervals (CI). Categorical variables were compared using the  $\chi^2$  test (with Yates' correction when necessary) or Fisher's exact test, and quantitative variables with the Student's test or Welch's *t*-test for non-homogeneous variances. One-way ponderated analysis of variance (ANOVA) was used for the comparison of more than two means. The strength of association was assessed by the  $\eta^2$  coefficient. A logistic regression analysis with progressive elimination of independent variables (age, sex, educational level, socioeconomic level, civil status and place of residence) was carried out. Statistical significance was set at  $p < 0.05$ .



**Table 1: Activities related to the life-style and self-assessment of overall daily activity: scale of the Adelaide Activities Profile (AAP)**

Scale and variables	Kappa statistics <sup>†</sup>	95% CI
Domestic chores		
Preparing meals	0.950	0.83 to 1.047
Washing clothes	1.000	1.000 to 1.000
Light housework	0.950	0.853 to 1.047
Washing dishes	1.000	1.000 to 1.000
Household shopping	0.900	0.766 to 1.034
Heavy housework	1.000	1.000 to 1.000
Making telephone calls	0.895	0.626 to 1.097
Household maintenance		
Heavy gardening	1.000	1.000 to 1.000
Light gardening	1.000	1.000 to 1.000
House/car maintenance	0.931	0.798 to 1.064
Driving car	1.000	1.000 to 1.000
Daily walking <sup>‡</sup>	0.897	0.780 to 1.013
Hobbies	0.946	0.841 to 1.051
Services to others		
Attending religious services	0.776	0.535 to 1.017
Paid employment	1.000	1.000 to 1.000
Caring other family members	0.787	0.385 to 1.190
Social activities		
Outdoor recreation	1.000	0.536 to 0.951
Outdoor sport	0.744	0.290 to 1.282
Social activities	0.655	0.692 to 1.099
Self-assessment		
Life-style activity	0.782	0.653 to 0.910

<sup>†</sup>Degree of agreement: 0,81-1,00 very good; 0,61-0,80 good; 0,41-0,60 moderate; 0,21-0,40 regular; 0-0,20 poor.

<sup>‡</sup>Polychotomic (ordinal) variable.

## Results

A total of 160 (17%) of the 950 subjects were not included in the study, mostly because of refusal to participate (9%), change of residence (3%) or failure to contact the person (5%). The number of losses was similar for rural and urban settings and in both cases was greater among women than men (60% vs. 46%). The study population included 388 persons (192 men, 196 women) from rural areas and

392 persons (172 men, 220 women) from urban areas (response rate of 83%).

The distribution of AAP total score in the study population according to sex, years of age and place of residence is shown (Table 2). Women scored significantly higher than men in the rural and urban settings and in all age groups (ANOVA,  $p < 0.05$ ) except for the very old ( $\geq 85$  years) stratum from rural areas. In the age group 80-84 years, men



from urban areas showed significantly higher mean (SD) scores than men from rural areas (6.75 [3.38] vs. 4.10 [2.21]). As expected, an age-dependent decrease in life-style activities was observed in both men and women. The distribution of AAP scores by percentile as a qualitative approximation of life-style activity in men and women is shown (Figure 1).

Mean scores of the AAP scales of domestic chores, household maintenance, service to others and social activities according to place of residence are shown (Tables 3,4). In the category of domestic chores, mean ratings for women (4.56, 95% CI 4.30 to 4.84) were significantly higher ( $p < 0.05$ ) than for men (1.36, 95% CI 1.11 to 1.62) both in urban and rural areas except in the oldest age group ( $\geq 85$  years). In the scale of household maintenance, also except for group of  $\geq 85$  years, men rated significantly higher (3.31, 95% CI 3.11 to 3.53) than women (2.34, 95% CI 2.21 to 2.47), independent of the place of residence. In the scale of service to others, women scored (2.01, 95% CI 1.88 to 2.14) significantly higher than men (1.68, 95% CI 1.55 to 1.81), except in those older than 80 years; whereas in the scale of social activities, mean ratings for men and women were 0.78 (95% CI 0.65 to 0.91) and 0.43 (95% CI 0.33 to 0.53), respectively. Younger men from rural areas were significantly more involved in social activities (outdoor recreation and outdoor sport) than women, while in urban areas both sexes scored similarly on the scale of social activities. Overall, there was an age-dependent significant decrease in the mean scores of all scales, with the exception of men from urban areas, in the scale of domestic chores.

Self-assessment of overall daily activity in relation to mean scores of the AAP questionnaire showed a clear predominance of life-style activity rated as 'moderate' except for among the oldest old (Table 5).

Activities that in the multivariate analysis showed an odds ratio (OR) greater than 1.5 as explanatory variables were as follows: paid employment (sex, OR 3.72, 95% CI 2.78 to 6.67); light gardening (place of residence, OR 1.51, 95% CI, 2.09 to 1.10); heavy gardening (sex, OR 8.58, 95% CI 5.29

to 13.90); house/car maintenance (sex, OR 9.83, 95% CI 6.42 to 15.06); driving car (sex, OR 9.83, 95% CI 6.42 to 15.06); daily walking (place of residence, OR 1.58, 95% CI 1.16 to 2.16); hobbies (educational level, OR 2.28, 95% CI 1.56 to 3.33); outdoor recreation (sex, OR 3.58, 95% CI 2.58 to 5.00); and outdoor sport (sex, OR 4.16, 95% CI 2.32 to 7.48).

## Discussion

The present study used the AAP for assessing activities related to the life-style of older people. However, two items of the original 21-item questionnaire were excluded. The question of 'personal shopping' was considered redundant in respect to the item 'household shopping'; and the question of 'entertaining at home' was not compatible with the customs of the elderly persons living in the study environment for whom inviting people to their homes was unusual. On the other hand, all items were dichotomized into 'no' (absent) or 'yes' (present) responses instead of scoring 0,1,2 and 3 according to 'how often' the activity is performed<sup>8</sup>, and subjects were asked to provide responses which reflected their activity in a typical 15-day period. This was less likely to confuse the elderly participants than the original instrument, which considers activities in the last 3 months. Possible scores in the present study ranged from 0 to 19, which allowed the establishment of overall ratings as well as cut-off thresholds of appropriateness for each of the four AAP scales. The distribution of AAP scores by percentile may be considered a qualitative approximation of the comprehensive profile of the life-style activities of elderly people. However, most of the existing ADL indices are not satisfactory for detecting small but distinctive changes, among other reasons, because the rating scale is too coarse<sup>13</sup>. Instrumental activities of daily living are more complex scales that integrate the capacity of the subject to live without assistance at home and to be an active member of society, including domestic activities, preparing meals, use of public transport and the telephone, responsibility for the use of money, medication etc. Some of these activities are more difficult to categorise and assess because they are influenced by important sociocultural factors<sup>14</sup>.

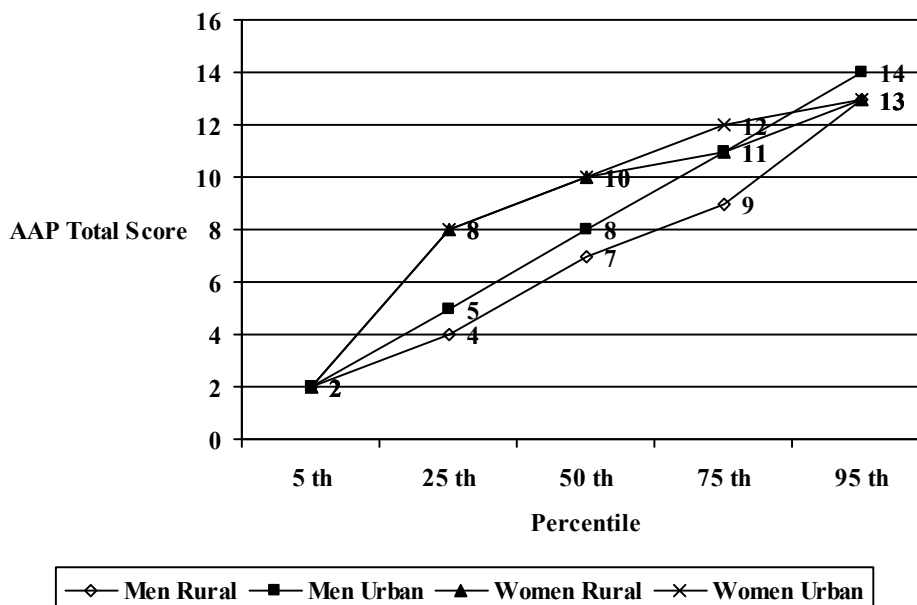




**Table 2: Mean total scores of the Adelaide Activities profile (AAP) according to sex, groups of age and place of residence**

Age (years)	Rural <i>n</i> = 388				Urban <i>n</i> = 392			
	Men <sup>†</sup>		Women <sup>†</sup>		Men <sup>†</sup>		Women <sup>†</sup>	
	Mean (SD)	95% CI	Mean (SD)	95% CI	Mean (SD)	95% CI	Mean (SD)	95% CI
65–69	8.68 (2.59)	8.02 to 9.34	11.41 (1.61)	10.99 to 11.83	9.65 (3.26)	8.84 to 10.45	10.92 (2.11)	10.43 to 11.41
70–74	8.44 (3.99)	7.25 to 9.63	10.09 (2.40)	9.37 to 10.81	8.31 (3.52)	7.21 to 9.40	10.94 (2.15)	10.31 to 11.56
75–79	6.43 (2.84)	5.52 to 7.33	9.29 (2.95)	8.37 to 10.20	6.81 (3.73)	5.47 to 8.16	9.27 (2.87)	8.40 to 10.15
80–84	4.10 (2.21)	3.26 to 4.94	7.35 (3.66)	6.01 to 8.70	6.75 (3.38)	5.16 to 8.33	7.48 (3.14)	6.29 to 8.68
≥85	4.60 (3.02)	3.19 to 6.01	4.26 (3.16)	2.74 to 5.79	4.23 (3.24)	2.27 to 6.19	5.56 (3.19)	4.10 to 7.02
Total	7.04 (3.48)	6.55 to 7.53	9.31 (3.38)	8.84 to 9.79	8.05 (3.75)	7.41 to 8.61	9.53 (3.19)	9.11 to 9.96

<sup>†</sup>Total men = 364, total women = 416.



**Figure 1: Distribution of the Adelaide Activities Profile (AAP) total scores by percentile, according to sex and place of residence.**



**Table 3: Mean scores of the Adelaide Activities Profile (AAP) scales in 364 men according to groups of age and place of residence**

Age (years)	Rural <i>n</i> = 192				Urban <i>n</i> = 172			
	Domestic chores	Household maint.	Service to others	Social activities	Domestic chores	Household maint.	Service to others	Social activities
	Mean (SD)				Mean (SD)			
65–69	1.51 (1.86)	4.30 (1.13)	1.91 (0.85)	1.05 (0.91)	2.92 (1.98)	4.10 (1.21)	2.16 (0.85)	1.29 (0.55)
70–74	1.90 (2.13)	3.58 (1.63)	1.95 (0.95)	1.14 (0.94)	1.97 (1.89)	3.71 (1.67)	1.78 (0.73)	1.28 (0.45)
75–79	1.10 (1.67)	3.07 (1.18)	1.65 (0.83)	0.67 (0.91)	1.62 (2.01)	2.93 (1.39)	1.65 (0.90)	1.34 (0.48)
80–84	0.65 (0.89)	2.10 (0.97)	1.24 (0.78)	0.20 (0.49)	1.70 (2.02)	2.70 (1.17)	1.60 (0.75)	1.30 (0.47)
≥85	1.30 (1.97)	2.05 (0.75)	1.10 (0.85)	0.25 (0.44)	1.30 (2.09)	1.61 (0.76)	1.07 (1.18)	1.23 (0.43)
Total	1.36 (1.83)	3.31 (1.48)	1.68 (0.90)	0.78 (0.90)	1.94 (1.98)	3.44 (1.52)	1.82 (0.90)	1.29 (0.49)

Maint., maintenance

**Table 4: Mean scores of the Adelaide Activities Profile (AAP) scales in 416 women according to groups of age and place of residence**

Age (years)	Rural <i>n</i> = 196				Urban <i>n</i> = 220			
	Domestic chores	Household maint.	Service to others	Social activities	Domestic chores	Household maint.	Service to others	Social activities
	Mean (SD)				Mean (SD)			
65–69	5.47 (0.91)	2.87 (0.76)	2.42 (0.64)	0.71 (0.91)	5.39 (1.21)	2.67 (0.96)	2.29 (0.67)	1.20 (0.40)
70–74	5.11 (1.35)	2.35 (0.64)	2.20 (0.86)	0.42 (0.69)	5.22 (1.16)	2.80 (1.03)	2.19 (0.61)	1.12 (0.33)
75–79	4.78 (1.63)	2.21 (0.92)	2.14 (0.89)	0.33 (0.68)	4.52 (1.82)	2.22 (0.93)	2.15 (0.77)	1.11 (0.32)
80–84	3.51 (2.27)	1.93 (0.92)	1.51 (0.89)	0.25 (0.63)	3.72 (2.06)	1.82 (0.65)	1.58 (0.94)	1.20 (0.41)
≥85	1.78 (2.20)	1.68 (1.05)	0.84 (0.60)	0.10 (0.45)	2.20 (2.19)	1.60 (0.95)	1.52 (1.00)	1.20 (0.40)
Total	4.56 (1.93)	2.34 (0.91)	2.01 (0.92)	0.43 (0.75)	4.60 (1.89)	2.38 (1.02)	2.06 (0.81)	1.16 (0.37)

Maint., maintenance



**Table 5: Self-assessment of overall daily activity and relation to mean scores of the Adelaide Activities Profile (AAP) according to sex, age and place of residence**

Data source and age (years)	Daily activity							
	None		Moderate		Intense		Very intense	
	<i>n</i>	Mean (SD)	<i>n</i>	Mean (SD)	<i>n</i>	Mean (SD)	<i>n</i>	Mean (SD)
Men from rural areas ( <i>n</i> = 192)								
65–69	1	5.00(0.00)	42	8.10 (2.25)	12	9.92 (2.27)	5	11.40 (3.44)
70–74	4	5.25 (3.40)	31	8.03 (3.64)	6	12.5 (4.28)	2	9.00 (0)
75–79	7	4.14 (3.24)	29	6.59 (2.20)	3	9.67 (4.73)	1	8.00 (0)
80–84	6	2.00 (2.10)	22	4.59 (1.94)	1	6.00 (0)	0	0
≥85 <sup>†</sup>	3	6.33 (5.85)	15	4.40 (2.56)	0	0	0	0
Women from rural areas ( <i>n</i> = 196)								
65–69	0	0	45	11.22 (1.18)	7	12.43 (1.90)	6	12.33 (2.58)
70–74	1	11.00 (0)	36	9.94 (2.56)	8	10.63 (1.69)	0	0
75–79	5	4.20 (3.03)	27	9.59 (2.32)	9	11.11 (1.36)	1	10.00 (0)
80–84	7	3.29 (3.15)	22	8.64 (3.00)	2	7.50 (0.71)	0	0
≥85 <sup>‡</sup>	8	2.25 (1.83)	9	5.22 (3.27)	1	7.00 (0)	0	0
Men from Urban areas ( <i>n</i> = 172)								
65–69	3	5.33 (5.86)	47	9.38 (2.75)	13	11.65 (3.43)	2	9.50 (3.53)
70–74 <sup>¶</sup>	5	5.60 (4.56)	28	8.57 (3.33)	5	7.60 (2.41)	3	12.0 (3.00)
75–79 <sup>¶</sup>	8	4.75 (3.20)	18	7.22 (3.49)	4	7.75 (2.06)	1	16.00 (0)
80–84	3	3.33 (1.53)	15	7.07 (3.26)	2	9.50 (3.54)	0	0
≥85	7	2.71 (2.93)	6	6.00 (2.83)	0	0	0	0
Women from urban areas ( <i>n</i> = 220)								
65–69	4	6.50 (1.73)	47	10.87 (1.73)	19	11.58 (1.47)	4	12.75 (0.50)
70–74	1	9.00 (0)	30	10.50 (2.03)	15	11.33 (1.76)	2	15.50 (0.71)
75–79 <sup>¶</sup>	2	3.00 (1.41)	35	9.29 (2.57)	6	11.50 (1.87)	0	0
80–84	6	3.33 (1.63)	16	16.00 (7.88)	6	10.33 (1.51)	0	0
≥85	13	3.00 (2.58)	8	7.75 (2.05)	3	9.33 (1.53)	1	10.00 (0)

No response: <sup>†</sup> 2 persons; <sup>¶</sup> 1 person.

Despite scientific evidence linking regular physical activity to a wide range of physical and mental health benefits<sup>15</sup>, the majority of older people remain essentially sedentary<sup>16</sup>. Walking appears to have a positive effect in reducing the risk of death from cancer and cardiovascular disease, in addition to its effect on overall mortality<sup>17,18</sup>. The key is to encourage patients to initiate a program of regular, moderate exercise 30 min per day, three times a week, or preferably on a daily basis<sup>19</sup>. Although counselling in the primary care setting is relevant from a public health perspective, few primary-care physicians routinely counsel patients to adopt and maintain regular physical activity<sup>20</sup>.

Older people who continue to develop activities related to indoor and outdoor domestic chores as well as outdoor social

activities are more likely to maintain an adequate function level for an independent life. Moreover, attendance at cultural events, reading books or periodicals, and marking music or singing in a choir has been shown to have a positive influence on survival<sup>21</sup>. Castillo Soria et al.<sup>22</sup> found that 30% of men and 29% of women in rural areas do not take part in any leisure activity and that 6% of older people had social relationships restricted to the family or to a nucleus of close friends. At the urban level, Colomo's study<sup>23</sup> showed that 19% of men and 33% of women have a very limited friendship circle.

In the present study, mean ratings for the overall AAP profile as well as for each subscale were higher in women than in men, both in rural and urban environments, except





for household maintenance-related activities in which men scored significantly higher. In our sample, more than 75% of people reported that they walked approximately 30 min daily. Important differences in life-style activities between older people from urban and rural areas were not detected. This may be explained by the fact that in our province most elderly people living in urban areas are rural immigrants who strongly maintain their customs and life-style. On the other hand, statistically significant differences found in the different AAP scales in relation to gender are a clear indication of the well established roles for men and women in our sociocultural context.

One of the possible limitations of this study was that those subjects with a bad memory may neglect some questions in the re-test, because this was performed 30 days after the initial administration of the test. However, only people over 65 years without cognitive impairment participated in this study, which minimized the risk of recall bias. On the other hand, the stability of responses to questionnaire was satisfactory for almost all the items analyzed, which confirms its soundness for studying life style in the elderly<sup>24</sup>.

Our findings in a population-based sample of 780 older mentally capable men and women indicate that the 19-item version of the AAP scale is a valuable survey instrument as an objective guide for studying activities related to life-style in community settings. However, transcultural adaptation and validation of the Spanish version is necessary for the use of this instrument in future studies.

## Conclusion

We conclude that this measure of functional ability in daily life is suitable for showing changes over time in longitudinal studies of community-dwelling elderly people of different ages, in particular as a summary statement of the individual's health status. Furthermore, the measure can be used in intervention studies in order to identify the effect of intervention or of prevention, hopefully so that the elderly do not cross the threshold from feeling tired to being in need of help with daily tasks.

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