

# Lifestyles of local residents: Development of standard values for the Frenchay Activities Index for local residents aged 10–79 years

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## Abstract

**Objectives:** We developed standard values for the Frenchay Activities Index (FAI) for volunteers aged 10–79 years, and evaluated the lifestyles of healthy local residents by age group.

**Subjects:** Participants were 788 local residents (326 males, 462 females) who participated in regional events held near Nagoya City and agreed to cooperate with this survey.

**Methods:** We set up a survey venue during a regional event. The FAI questionnaire was administered to consenting participants by two qualified occupational therapists and five volunteer staff who were briefed regarding the FAI.

**Results:** Comparisons of total FAI scores by sex for each age group showed that for participants aged 30–79 years, women's scores were significantly higher than men's. There were no sex-based differences among participants in their teens and 20s.

**Conclusions:** Participants in their teens and 20s rarely engage in domestic activities, and focus on studying or academic activities. The findings also suggested that by age 30 years, men mainly focus on work and engage less in housekeeping activities. Women appear to focus on both housework and their occupations by age 30 years. The FAI reflects changes in Japanese participants' lifestyles by age, and these scores appeared to be effective for evaluating activities parallel to daily living, regardless of age.

**Keywords:** Frenchay Activities Index, APDL, Standard values

## Introduction

To create an appropriate rehabilitation program, it is necessary for therapists to imagine what life will be like for a patient when he or she returns to their home and community. Knowledge of the kinds of lifestyles that are led at home and in the wider community by healthy people belonging to the same generation is therefore essential. Healthy lifestyles encompass usual activities of daily living (ADL) such as preparing meals, changing clothing, bowel regularity, exercise, and hygiene, as well as applied behaviors such as cleaning, washing, shopping, money management, and hobbies. These applied behaviors are influenced by factors such as age, sex, academic background, and lifestyle. In Japan, such activities are referred to as activities parallel to daily living (APDL).<sup>1,2</sup> However, currently there is no consensus regarding APDL, its scope, or methods of assessment.<sup>3–5</sup> The “ability index for seniors,” as reported by Furuyano et al.,<sup>6</sup> is frequently used in Japan to evaluate APDL. This evaluation aims to assess the feasibility of the target population (e.g., older adults) taking on social roles such as operational independence, evidenced by the ability to perform tasks (e.g., paying bills), cognitive activities (e.g., filling out pension documents and reading), and social activities (e.g.,

visiting the sick). In Europe and the United States, the Instrumental Activities of Daily Life Scale is used to determine the health of older adults by evaluating performance on tasks such as preparing meals, doing laundry, home maintenance, and taking medication.<sup>7</sup> This activity scale assesses participants and classifies them by sex. We proposed a 7-step hierarchical model comprising the social roles of lifestyle maintenance, functional health, perception and cognition, physical independence, instrumental independence, and situational correspondence, ordered from simple to complex.

Holbrook et al.<sup>8</sup> developed the Frenchay Activities Index (FAI) in 1983 to evaluate the APDL necessary for patients with stroke to be able to live in the community. The FAI includes 15 items covering various applied activities in subjects' daily and social lives such as shopping, meal preparation, walking outdoors, and hobbies. Evaluation is conducted via an interview. The interviewer scores each item from 0 to 3 based on the frequency of the activity over a 3- or 6-month period. While other evaluation methods assess whether an activity is performed, the FAI assesses activity frequency and allows for a clearer grasp of subjects' living situations. In addition, scoring is simple, and the reliability and validity of the FAI as an evaluation method have been confirmed in Japan.<sup>1</sup> Wade et al. stated that the FAI is not a basic ADL assessment, but has a higher level of autonomy; in other words, the FAI reflects the subject's degree of social survival.<sup>9</sup> In addition, Shirado et al. noted that higher function evaluations using the FAI for patients with stroke living in Japan have been considered; the FAI is believed to be one of the most useful evaluation methods available, and its reliability and validity are being investigated.<sup>5</sup> However, the only available report in

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Table 1 Participants' profiles

	total	10s		20s		30s		40s		50s		60s		70s	
		male	female	male	female	male	female	male	female	male	female	male	female	male	female
No. of subjects	788	326	462	45	76	43	63	46	56	55	52	39	80	45	61
Age	44.4 (19.6)	44.5 (19.0)	44.3 (20.1)	16.7 (0.9)	16.8 (1.3)	24.5 (2.7)	23.6 (3.2)	34.4 (2.8)	43.8 (2.9)	43.4 (2.8)	55.0 (2.7)	64.1 (2.7)	64.0 (3.0)	73.6 (2.5)	74.2 (3.1)
Marital status															
Married	520	235	285	2	1	9	12	40	52	50	49	38	70	45	37
Not married	268	91	177	43	75	34	51	6	4	5	3	1	10	0	24
Live with others															
Yes	716	306	410	44	75	31	50	44	55	55	51	37	75	45	48
No	72	20	52	1	2	12	13	2	1	0	1	2	5	0	13
Type of cohabitator															
Spouse	152	65	87	0	0	6	3	5	3	4	8	21	39	23	19
Spouse+child	203	89	114	0	0	4	5	32	45	33	21	7	10	4	3
Spouse+child+nephew/niece	39	16	23	0	0	0	0	0	0	0	0	3	12	13	9
Parent+spouse	16	2	14	0	0	0	0	0	1	0	3	0	2	0	0
Parent+spouse+child	66	34	32	0	0	0	2	0	0	9	13	2	0	0	0
Parent+child	6	3	3	0	0	0	0	1	1	4	2	1	0	0	0
Parent+sibling	112	34	78	31	61	7	24	2	0	1	0	0	0	0	0
Parent+other	4	2	2	1	0	1	1	0	0	0	0	0	0	0	0
Parent+sibling+other	17	6	11	0	6	0	5	0	0	0	0	0	0	0	0
Parent	39	24	15	10	10	11	4	1	2	0	0	0	1	0	0
Child	26	4	22	0	0	0	1	1	0	4	0	1	6	1	4
Child+nephew/niece	16	3	13	0	0	0	0	0	0	0	0	2	3	1	8
Other	25	24	1	2	3	5	4	4	3	0	5	0	6	2	18
Occupation															
Company employee	192	140	52	3	1	27	18	35	10	6	22	13	4	2	0
Public servant	38	25	13	0	0	5	7	6	1	3	7	1	1	0	0
Homemaker	164	2	162	0	0	0	6	0	37	0	28	0	50	1	17
Self-employed	50	39	11	1	0	1	1	3	3	1	18	1	9	7	1
Farmer	21	12	9	1	0	1	0	0	0	1	1	0	2	0	6
Unemployed	106	45	61	0	2	1	5	0	1	0	1	9	13	24	32
College student	37	9	28	4	13	5	17	0	0	0	0	0	0	0	0
High school student	88	34	54	35	54	0	0	0	0	0	0	0	0	0	0
Other	92	20	72	1	6	3	9	2	17	2	3	10	5	11	5
Highest educational level															
Elementary school	21	6	15	0	1	0	0	0	0	0	0	0	0	0	14
Middle school	210	75	135	40	58	3	1	3	1	0	3	13	10	37	25
High school	319	120	199	5	17	15	33	27	31	23	17	38	22	38	11
College (4-year, <4-year)	201	111	90	0	0	21	21	15	28	29	31	6	5	9	1
Other	37	14	23	0	0	4	8	1	9	1	1	2	0	2	1

Table 2 Revised Frenchay Activities Index

1. Preparing main meals (excluding shopping)	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
2. Washing up after meals	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
3. Washing clothes	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
4. Light housework: Cleaning your space with a broom or cleaning device.	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
5. Heavy work: Folding bedding, sweeping floors, moving furniture, or carrying bags.	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
6. Local shopping	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
7. Social occasions: for example, movies, theater, drinking, eating out, meeting with friends.	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
8. Minutes: walks, shopping, outings longer than 15 minutes.	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
9. Actively pursuing a hobby: arts, crafts, sports, other things done for fun (not including watching sports on TV).	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
10. Driving a car/going on a bus, or other transport (e.g., bicycles, trains, airplanes).	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
11. Travel for an outing/car ride: Going on recreational trips (e.g., by car, bus, airplane, excluding travel for work purposes)	<input type="checkbox"/> I do this rarely. <input type="checkbox"/> I do this more than once per week.
12. Gardening	<input type="checkbox"/> I occasionally pull weeds, mow grass, and tend to my garden. <input type="checkbox"/> I regularly tend to my garden, and do replanting/potting as needed.
13. Household maintenance	<input type="checkbox"/> I do things like change light bulbs. <input type="checkbox"/> In addition to the above, I also do home/car repairs myself.
14. Reading books: reading habits (excluding newspapers, magazines, or pamphlets)	<input type="checkbox"/> I rarely read. <input type="checkbox"/> I read often (over twice per month).
15. Gainful work: Full-time, temporary, part-time (any work that provides income, excluding volunteer work)	<input type="checkbox"/> I work 1–9 hours per week. <input type="checkbox"/> I work over 30 hours per week.

Japan concerning standard values for the FAI targeted healthy middle-aged and older adults aged 55–90 years. No standard values for young people have been reported. Identifying standard values for younger people may serve as a reference point when determining treatment plans for youth-onset stroke patients. This study aimed to prepare FAI standard values for healthy volunteers of all ages, from teens to those aged in their 70s, and characterize the lifestyles of healthy people living in the community by age group.

## Methods

### Participants

Target participants for this study were 788 individuals (326 males, 462 females) who participated in regional events held near Nagoya City in 2007 and agreed to participate in this survey. Participants' average age was  $44.4 \pm 19.6$  years (range 15–79 years). The breakdown of participants by age group was: 121 teens (45 men, 76 women); 106 aged 20–29 years (43 men, 63 women); 115 aged 30–39 years (46 men, 69 women); 111 aged 40–49 years (56 men, 55 women); 110 aged 50–59 years (52 men, 58 women); 119 aged 60–69 years (39 men, 80 women); and 106 aged 70–79 years (45 men, 61 women) (Table 1).

### Methodology

Our survey method involved establishing a venue to administer the questionnaire during a regional event. The questionnaire was administered to eligible participants who were briefed about the study and provided written consent to participate. Two qualified occupational therapists and five volunteer staff who were briefed on the FAI administered the questionnaires. The FAI is a tool to assess the frequency at which subjects perform activities such as shopping, preparing meals, cleaning up after meals, washing, household cleaning and organizing, doing physical work, going out, taking walks outdoors, practicing hobbies, using transportation, traveling, gardening, performing home and auto maintenance and repair work, reading, and occupational work. Each item is scored from 0 to 3, with a maximum of 45 points. The revised version of the FAI developed by Hachisuka et al. was used in this study. The revised FAI was translated into Japanese to evaluate the APDL of SMON patients in 1993, and includes a brief description of how to adapt the instrument to Japanese conditions (Table 2). Items examined included: total FAI score, total score differences by sex, total score differences by age group, and score differences by age for each question (Table 2). The Mann–Whitney U test was used to compare total FAI scores between the sexes and differences in total FAI score among age groups. Statistical analyses were performed with SPSS version 21.0 (IBM Corporation). This study was approved by the Fujita Health University Medical Research Ethics review committee.

Table 3 Standard values for total Frenchay Activities Index scores

	Median. score	SD	Max score	Min score
Overall (N=788)	28	6.9	43	6
Male (N=326)	25	6.5	42	6
Female (N=462)	31**	6.5	43	9

\*  $P < 0.05$  \*\*  $P < 0.01$

## Results

### Comparison of total FAI scores by sex and age group

The overall median  $\pm$  standard deviation for FAI total scores was  $28 \pm 6.9$  for both male and female participants. When comparing the sexes, the mean scores were  $25 \pm 6.5$  for males and  $31 \pm 6.5$  for females, and this difference was significant (Table 3).

Comparison of total FAI score by sex for each age group showed that women's scores were significantly higher than men's for participants aged 30–79 years, but there were no sex differences between participants in their teens and 20s. Comparisons of total FAI scores for each age group showed no significant differences among males, who all achieved similar scores. In contrast, females in their teens achieved significantly lower total scores compared with the other age groups, but females aged 30–39 years consistently maintained a specific score level. Scores for females aged 50–79 years were significantly higher than scores for male participants of similar age (Table 4).

### Sex comparisons by age group

Scores for each question for male and female participants in each age group are displayed in Table 5. Fewer men achieved high scores on questions related to meal preparation, meal clean up, household cleaning/organization, and participation in shopping for each age group compared with women. Female participants in their teens and 20s also participated less in household tasks such as meal preparation, dishwashing after meals, household cleaning/organizing, shopping, and other cleaning. However, the proportion of women engaging in these kinds of domestic work markedly increased when they reached their 30s. Activities that showed increasing trends as both male and female participants aged included heavy physical work, garden work, home repairs, and automotive care. In addition, male participants more frequently engaged in home repairs or automotive maintenance than female participants. No significant sex-based differences were observed with regard to outings, outdoor walking, traveling, and transportation habits, but there was a tendency for outings and outdoor walks to increase with age. Transportation scores increased for teenagers and those aged over 60 years. Male participants showed higher scores for reading than females, but the same trends were observed for both males and females in terms of hobbies and physical work. Reading and physical work also tended to decrease with age.

Table 4 Differences in standard values for total Frenchay Activity Index score by age group

	Overall Median. male score	Median. male score	Median. female score	Sex difference
10s	22 (5.5)	23 (6.1)	21 (5.2)	
20s	28 (5.5)	28 (6.3)	27 (4.9)	
30s	29 (6.0)	25.5 (6.2)	32 (4.8)	**
40s	30 (6.6)	25 (6.2)	34 (4.8)	**
50s	30 (7.0)	23.5 (6.0)	34 (5.0)	**
60s	32 (6.5)	25 (7.3)	34 (5.2)	**
70s	30 (7.2)	26 (8.2)	32 (5.4)	**

( ) = standard deviation \*  $P < 0.05$  \*\*  $P < 0.01$

Table 5 Comparison of Frenchay Activities Index question items by sex for each age group

	10s		20s		30s		40s		50s		60s		70s	
	male	female	male	female	male	female	male	female	male	female	male	female	male	female
Local Shopping	2.3 (0.8)	2.6 (0.7)	2.7 (0.5)	2.8 (0.5)	2.6 (0.6)	3.0 (0.3)	2.5 (0.7)	2.9 (0.4)	2.2 (0.9)	2.8 (0.7)	2.1 (0.9)	2.9 (0.5)	2.3 (0.9)	2.8 (0.5)
Preparing main meals	0.7 (0.7)	1.1 (0.5)	1.0 (1.1)	1.8 (0.6)	0.9 (1.0)	2.8 (0.7)	0.7 (0.9)	2.9 (0.4)	0.7 (1.0)	2.9 (0.5)	0.5 (0.9)	2.9 (0.4)	0.6 (1.1)	2.7 (1.0)
Washing up after meals	1.4 (1.2)	1.8 (0.8)	1.4 (1.2)	2.1 (0.8)	1.3 (1.2)	2.9 (0.6)	1.3 (1.1)	3.0 (0.2)	0.9 (1.1)	2.9 (0.7)	1.3 (1.1)	2.9 (0.4)	1.0 (1.2)	2.8 (0.8)
Washing clothes	1.2 (1.3)	1.1 (0.6)	1.4 (1.4)	2.1 (1.0)	1.0 (1.2)	2.8 (0.8)	0.7 (1.1)	3.0 (0.5)	0.4 (1.0)	2.8 (0.9)	0.8 (1.2)	2.9 (0.7)	0.7 (1.2)	2.9 (0.7)
Light housework	1.7 (0.9)	1.8 (0.6)	2.0 (1.1)	2.5 (0.7)	1.7 (1.2)	2.9 (0.5)	1.5 (1.1)	3.0 (0.4)	1.2 (1.2)	2.9 (0.4)	1.5 (1.2)	2.8 (0.7)	1.6 (1.2)	2.9 (0.4)
Heavy work	1.7 (1.1)	1.3 (0.7)	2.2 (1.0)	2.2 (1.0)	2.1 (1.1)	2.8 (0.7)	2.2 (0.9)	2.9 (0.5)	2.0 (1.0)	2.8 (0.8)	2.4 (1.0)	2.6 (1.0)	2.4 (1.0)	2.6 (1.1)
Social occasions	2.4 (1.0)	2.2 (1.0)	2.2 (1.1)	2.2 (1.2)	2.2 (1.0)	2.0 (1.1)	2.3 (1.0)	2.3 (1.2)	2.1 (1.1)	2.7 (1.0)	2.5 (1.0)	2.4 (1.0)	2.6 (0.8)	2.8 (0.9)
Minutes	0.7 (0.8)	0.6 (0.5)	0.9 (0.8)	0.8 (0.5)	0.9 (0.7)	0.8 (0.5)	0.9 (0.6)	0.8 (0.5)	0.9 (0.5)	1.0 (0.5)	1.0 (0.6)	1.2 (0.4)	1.2 (0.8)	1.1 (0.5)
Actively pursuing q hobby	1.9 (1.1)	1.8 (0.9)	1.9 (1.2)	1.6 (0.8)	1.3 (1.2)	1.8 (1.0)	1.6 (1.3)	1.9 (0.8)	1.8 (1.3)	1.9 (0.9)	1.7 (1.3)	1.9 (1.2)	1.4 (1.3)	1.8 (1.2)
Driving a car/going on a bus	2.6 (0.7)	1.8 (1.0)	2.2 (1.0)	1.7 (0.9)	1.8 (1.1)	1.5 (0.8)	1.9 (1.0)	1.8 (0.8)	1.9 (1.1)	1.9 (1.0)	1.9 (1.1)	2.2 (1.1)	2.0 (1.2)	1.9 (1.1)
Travel on an outing/	2.6 (0.8)	2.6 (0.7)	2.4 (1.1)	2.6 (0.9)	2.3 (1.0)	2.6 (0.9)	2.3 (1.0)	2.4 (1.1)	2.4 (0.8)	2.5 (1.0)	2.1 (1.0)	2.3 (1.1)	2.4 (1.0)	2.4 (1.1)
Gardening	0.2 (0.5)	0.2 (0.0)	0.3 (0.5)	0.4 (0.0)	0.7 (0.9)	1.1 (0.5)	1.1 (1.2)	1.7 (0.5)	1.1 (1.0)	1.9 (0.8)	1.7 (1.0)	2.1 (0.9)	1.7 (1.2)	2.1 (1.2)
Household maintenance	0.4 (0.8)	0.1 (0.0)	1.7 (1.1)	0.7 (0.0)	1.8 (1.1)	0.8 (0.4)	1.8 (1.0)	1.3 (0.5)	1.6 (1.1)	1.0 (0.5)	2.0 (1.0)	1.4 (0.2)	1.8 (1.1)	1.3 (0.5)
Reading books	0.6 (0.9)	0.6 (0.2)	2.6 (0.9)	1.9 (1.0)	3.0 (0.1)	1.6 (0.9)	3.0 (0.3)	1.6 (1.0)	2.9 (0.4)	1.5 (0.9)	1.7 (1.3)	0.7 (0.0)	1.0 (1.3)	0.6 (0.0)
Gainful work	2.1 (0.8)	2.0 (0.6)	2.5 (0.6)	2.4 (0.7)	2.4 (0.5)	2.0 (0.5)	2.1 (0.8)	2.0 (0.6)	2.3 (0.7)	2.1 (0.7)	2.1 (0.8)	2.1 (0.7)	2.2 (0.8)	2.2 (0.7)
Total score	22.6 (6.1)	21.7 (5.2)	25.9 (6.3)	31.4 (4.9)	25.9 (6.2)	33.2 (4.8)	24.4 (6.2)	33.3 (4.8)	25.2 (6.0)	32.9 (5.0)	25.2 (7.3)	30.1 (5.2)	27.2 (8.2)	27.8 (5.4)

( )=standard deviation

## Discussion

Many reports have been published in Japan regarding the use of evaluation methods related to basic ADL such as the Functional Independence Measure and the Barthel Index. However, there has been little clinical application or establishment of standard values with respect to APDL or instrumental ADL.<sup>1,6,10</sup> We believe that a sample size of 100 or more participants aged 10–79 years is necessary to establish statistically meaningful standard values. Women aged 30–79 years achieved significantly higher total FAI scores than men. This appeared to be because the FAI includes many items concerning housekeeping. In addition, total FAI scores for women aged 50–79 years tended to be higher compared with men, as reported by Hachisuka et al.<sup>1</sup> and Shirado et al.,<sup>5</sup> although the total FAI scores recorded in this study were higher. This might be attributed to participants in our study being more active than others, based on their participation in regional events. In contrast, the significantly lower scores achieved by participants in their teens than those in other age groups and no sex-based differences for subjects in their teens and 20s might be because teenagers and those in their 20s are focused on academic activities, are generally unmarried, and often live with their parents; thus, they may depend on their parents for most housekeeping tasks. Similar reasons may explain why sex differences were not observed in relation to outings, outdoor walking, traveling, hobbies, and working; although women's lifestyles were centered on housework in the past, today women are increasingly employed. Therefore, they tend to exhibit similar scores to men. For example, the employment rate in 1975 was 41.4% for women aged 25–29 years and 43.0% for women aged 30–34 years, which increased to 72.8% and 64.2%, respectively by 2011.<sup>11</sup> This increase suggests that the change in women's lifestyles was a key factor related to the disappearance of differences between the sexes with regard to factors such as hobbies, traveling, and going out.

When considering lifestyle trends, both men and women in Japan appear to be less likely to do household chores during their teens and 20s, and are more focused on academic activities. By

their 30s, men become more work-centric, and women focus more on housekeeping activities. Cases of women both working and keeping homes were also observed. After age 60 years, preferences for family and social activities increased in both men and women. The FAI scores obtained in this study appear to reflect changes in the lifestyles of Japanese people as they age, and the FAI may be effective for evaluating the APDL of Japanese people in various age groups.

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