Martine S. Bernstein, Michael C. Costanza, Alfredo Morabia

Division d'épidémiologie clinique, Hôpitaux universitaires de Genève

Physical activity of urban adults: a general population survey in Geneva

Summary

Objectives: Describing the distribution of physical activity in populations is of major importance for developing public health campaigns to prevent sedentarism.

Methods: A population-based survey conducted during 1997–1999 in Geneva, Switzerland, included 3410 randomly selected men (n = 1707) and women (n = 1703), aged 35 to 74 years. Percentiles P10, P50, and P90 summarised the distributions of the total energy expenditure and of the percents used in moderate intensity activities (3 to 3.9 times the basal metabolism rate (BMR), e.g., normal walking, household chores), and in high and very high intensity activities (≥ 4 BMR, e.g., brisk walking, sports).

Results: The total energy expenditure (median 2929 kcal/day in men, 2212 kcal/day in women) decreased with age. Prevalence of sedentarism, defined as less than 10% of total energy expended in ≥ 4 BMR activities, was 57% in men and 70% in women. Men expended 12% (median) of their total energy in 3 to 3.9 BMR and 8% in ≥ 4 BMR activities. Corresponding percentages in women were 11% and 5%. The highest prevalence of sedentarism was in older age, women, and lower socio-economic status persons.

Conclusion: Most of Geneva population is sedentary. Promoting physical activity should target children, adults and elderly, and physical activities which would be both attractive and financially affordable by most people.

Sedentarism is an independent risk factor for coronary heart disease[1-4], osteoporosis, hip fractures[5-7] and cancer[8]. However, the precise amount and intensity of physical activities performed by urban general populations remain elusive.

The total energy expenditure of an individual can be divided into several categories according to the intensity of each activity performed. When sleeping, we expend the basal metabolism rate (BMR). Low intensity activities such as office work, reading, watching television, and walking slowly expend less than 3 times the BMR (< 3 BMR). Most household chores and professional activities such as locksmith, handy work, electrician, etc., expend 3 to 3.9 BMR. Expending 4 times the BMR and more (≥ 4 BMR) are gardening activities like digging and carrying loads (4.1 BMR), brisk walking (4.5 BMR), climbing up stairs (6 BMR), heavy construction work (7 BMR), and most sports (6 to 12 BMR). The BMR changes according to gender, age, weight, and height[9], so for each activity the precise amount of energy expended according to these performer characteristics can be calculated.

The present survey of the general adult population of Geneva describes the total daily energy expenditure, and its distribution in moderate intensity activities (3 to 3.9 BMR), high and very high intensity activities (≥4 BMR including those ≥ 6 BMR), and very high intensity activities only (≥6 BMR). Physical activity was assessed using a questionnaire developed and validated in the target population[10]. A sedentary person was defined as someone expending less than 10 percent of their daily total energy expenditure in ≥ 4 BMR physical activities. This definition of sedentarism, developed in a previous paper[11], was based on the Surgeon General Report suggestion: "an increase in daily expenditure of approximately 150 kilocalories per day is associated with substantial health benefits and the activity does

not need to be vigorous to achieve benefit"[8]. Because the amount of energy expended depends on the BMR of the person, the duration and the intensity of the activity, we transformed the "150 kilocalories" into a percentage of the total energy expenditure. We also evaluated the risk factors for sedentarism in this generally urban population.

Materials and methods

Population and sample recruitment

Geneva (city and county, Switzerland) has a population of about 400000 distributed over 242 km² of land. Survey participants were randomly selected from January 1997 to December 1999 to represent the 89000 men and 98000 women, non-institutionalised adult residents aged 35 to 74 years. Subjects were identified from the official residents' register published each year which includes the first and last name, gender, age, nationality, and address. About 0.5% of the target population was sampled each year. Selected men and women received an information letter asking them to participate in a general population health survey[12]. In the case of non-response within two weeks, up to seven phone calls were made at different times of the week including week-ends. Those who could not be contacted after seven attempts were replaced. Systematic checks of the following years' editions of the population list showed that about 90% of them no longer resided in Geneva. Subjects who refused to participate were not replaced. The recruitment of a potential subject lasted from two weeks to two months.

Data collection

Survey respondents completed at home self-administered questionnaires about physical activity, diet, and general health including socio-demographic data and smoking history. They returned the questionnaires to a mobile epidemiology clinic where trained interviewers checked them for completion and measured the weight (lightly dressed without shoes) using a medical scale (precision 0.5 kg) and the height, using a medical gauge (precision 1 cm). Overall, the clinic visit lasted around 20 minutes. Among the persons selected and contacted, the average response rate was 62%, with 1795 men and 1785 women overall participating in the survey. For the purposes of the present report, all analyses were based on the respondents who had complete data for the variables employed in the multiple logistic regression models described below. Thus, the final study sample included 1707 men and 1703 women; its distribution was similar to the general population according to age and gender (data not shown).

Age was categorised into the four groups: 35–44, 45–54, 55–64, 65–74 years. Educational level was defined as primary (< nine years of schooling), secondary, and university (13 or more years and Swiss baccaulaureate or equivalent). Country of birth was grouped into Switzerland, Mediterranean (Italy, Spain, Portugal) and others (mainly France/Germany). Ever cigarette smokers had smoked at least 100 cigarettes in their lifetime. Ex-smokers had quit smoking a year or more before their interview. Body mass index (BMI) was computed as measured weight in kilograms divided by the square of measured height in meters. Normal weight, overweight and obesity were defined respectively as BMI < 25 kg/m²; 25 ≤ BMI < 30 kg/m²; BMI ≥ 30 kg/m².

Diet (food frequency) questionnaire

This instrument was previously developed and validated in the Geneva general population[13, 14]. It records the diet of the past four weeks and lists 80 groups of food items with a "standard" portion size. Respondents indicate their frequency of consumption and if they consumed less, the same, or more, than the standard portion size. Results permit evaluation of the daily total energy intake (kcal), the percent of the total energy provided by macronutrients, and the amount of dietary fiber (g).

Physical activity frequency questionnaire

This instrument measures the total daily, and the activity-specific energy expenditures. It was developed in the Geneva general population and validated using a heart rate monitor[10]. It lists 73 physical activities grouped by general type (e.g., occupational, leisure time, sports, etc.), together with their typical duration. The reference period is the past seven days. About 20 minutes are required for respondents to indicate the number of days per week (0 (never) to 7 (every day)), and the number of hours per day (0 to 10 hours time scale with 15 minute increments) that they spent in performing each activity. The duration of sleep is calculated from the reported waking hours. If the total number of hours declared by the respondent is different from 168 hours (7 × 24 hours), a two step correction is made. First, if the duration of sleep is less than 42 hours (six hours per night), it is set to 42 hours; or if it is more than 70 hours (ten hours per night), it is set to 70 hours. (About 2.5% of the initially calculated durations of sleep fell in each of these extremes). Second, the total duration for non-sleep activities is calculated and the duration for each non-sleep activity is proportionally adjusted so that the corrected duration of sleep plus the non-sleep duration sums to 168 hours. Each listed physical activity was pre-assigned a score indicating its intensity in terms of BMR multiples[9]. For example, an activity with a

3 BMR rating expends three times the energy required by a fasting individual, sleeping. The gender, age, and weight/height-specific BMR was calculated for each study respondent[9].

The daily energy expenditure for a given activity, EE_i for activity i, i = 1, ... 73, for a particular study participant was next calculated as:

$$EE_i = (\text{BMR multiple for activity) i} \times (\text{duration}$$
$$\text{of activity i, in minutes per day}) \times (\text{BMR of participant}$$
$$\text{in kcal per minute}).$$

The daily total energy expenditure, EE, for the study participant was then obtained as the sum of the study participant's activity-specific EE_i over all 73 physical activities:

$$EE = \sum_{i=1}^{73} EE_i .$$

The various physical activities were grouped according to their intensity. The two main categories were: 1) Moderate intensity activities expending 3 to 3.9 times the BMR such as most housekeeping chores, walking normally, and bicycling slowly (about 9 km/h); 2) High and very high intensity activities expending $\geq$ 4 times the BMR such as walking quickly or uphill (4.5 BMR), climbing stairs (6 BMR), sports and heavy construction work ($\geq$ 6 BMR). We also analysed separately the contribution of very high intensity activities ($\geq$ 6 BMR) such as sports and heavy construction work.

Statistical analyses
Summaries of the distributions of the categorical or grouped study variables described in the previous section were made in terms of percentages. Percentiles (P10, P50 (median), P90) with 95% nonparametric confidence intervals (CI)[12] by age groups for continuous variables related to total energy expenditure were depicted in two dimensional figures. Supplementary tables given in the appendix report the percentiles P10, P25, P50, P75, P90, as well as the mean and standard deviation (SD).

Multiple logistic regression models[15] were employed to evaluate the relationship between sedentarism and sociodemographic variables, with adjustment for the potential confounders age, education level, country of birth, cigarette smoking, dietary fat, and dietary fiber. The logistic analyses were performed separately for men and for women. The magnitudes of the associations between the sedentary versus active dependent variable and the risk factor independent variables were evaluated with odds ratios (OR) obtained by exponentiating the corresponding logistic regression coeffi-

cients, together with 95% Wald confidence intervals (CI = exponentiated CI for log OR). All models were checked for goodness-of-fit with the Hosmer-Lemeshow test; no inadequate fits were found (for men and women, respective p > 0.11 and p > 0.61).

Results

Sample characteristics
Prevalence of sedentarism was 57% in men and 70% in women (Tab. 1). Duration of sleep did not decrease with age. The proportions of obesity and overweight were respectively 13% and 45% in men and 9% and 24% in women. The majority of the men and women had a secondary level education and were Swiss. Only 27% of the men and 22% of the women were current smokers.

Physical activity distributions
Percentiles P10, P50 (median), and P90 (with 95% CI) of the total energy expended per day by age groups, are displayed in Figure 1. Percentiles 10 and 90 respectively, can be interpreted as follows: for example, for men, ages 35–44, only 10% of them expend 2526 kcal per day or less (the lowest 10%), and only 10% of them expend more than 3992 kcal per day (the highest 10%). Total energy clearly declines with age in men, the median showing a 500 kcal reduction in the oldest group (2461 kcal per day, age 65–74) compared to the youngest (3050 kcal per day, age 35–44). This decrease

		Men (n = 1702)	Women (n = 1703)
Age group (years)	%* 35–44	32	36
	% 45–54	32	33
	% 55–64	24	20
	% 65–74	12	12
Sedentarism **	%* No	43	30
	% Yes	57	70
Duration of sleep in hours (median)	35–44	7.5	8.0
	45–54	7.5	8.0
	55–64	8.0	8.5
	65–74	8.5	9.5
Body mass index (BMI)	%* < 25 kg/m²	42	67
	% [25–30 kg/m²]	45	24
	% $\geq$ 30 kg/m²	13	9
Education	%* University	37	36
	% Secondary	57	58
	% Primary	7	6
Country of birth ***	%* Switzerland	57	56
	% Others	27	31
	% Mediterranean	16	13
Cigarette smoking	%* Never smoker	34	54
	% Ex-smoker	38	24
	% Current smoker	27	22

* Percent of column n.
** Yes: < % energy expended in $\geq$ 4 BMR physical activities.
*** Others (Men/Women): France (37/38)%, Germany (7/8)%, otherwise (<4/<4)% each.

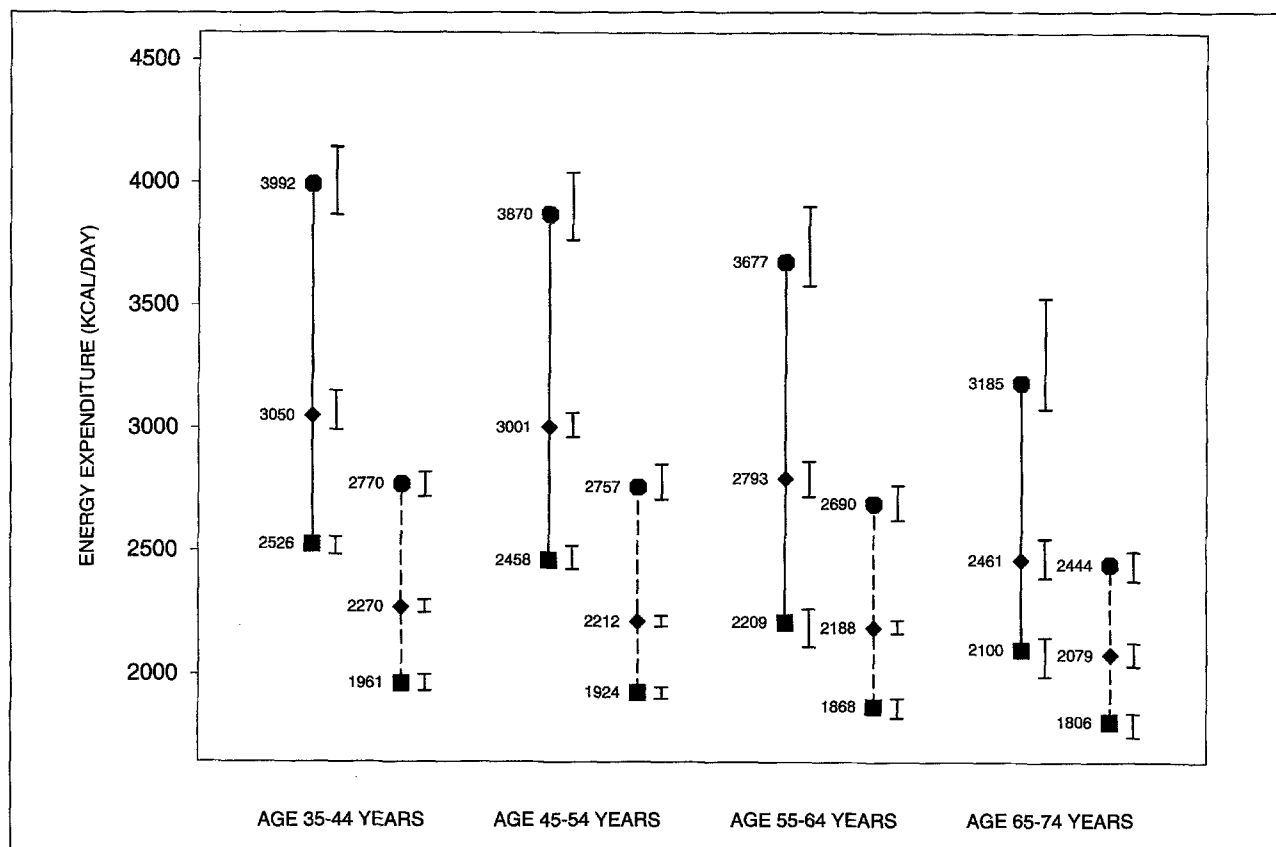**Table 1** Characteristics of study participants. Geneva, 1997–1999

Figure 1 Total energy expenditure, according to gender and age groups. Square = P10, Diamond = P50, Octagon = P90; Solid lines = Men, Dashed lines = Women. Solid lines with crossbars to right of symbols ≈ 95% confidence intervals

according to age is much smaller in women with only a 200 kcal reduction between the same age groups. Within each age group, a wider dispersion is seen in men (about 1500 kcal of difference between the percentile P10 and the percentile P90) compared to women (only 800 kcal of difference).

Distributions by age groups of the percents of total energy expended in moderate activites (3 to 3.9 BMR, such as walking normally) had no clear relationship with age: the percentile P10 and the median but not the percentile P90, seem to be increasing only after age 55 (Fig. 2 and Appendix).

In Figure 3, percentile P10 equals zero for all age groups, which means that at least 10% of men and women did not perform any high or very high intensity activities (≥ 4 BMR) such as brisk walking (4 BMR), stairs (6 BMR), sports (≥ 6 BMR). The median and the percentile P90 are decreasing with older age in both genders. While half the men in the youngest group expend less than 10% (median) of their energy in such activities, half the 65–74 year old men expend only 2.5% (median) in these types of activities. In women, the corresponding medians decrease from 5.8% in the youn-

gest to 1.5% in the oldest group. The percentile P90 is the point above which the 10% most active respondents are. Among the 10% most active men, ≥ 4 BMR activities represent about 30% or more of the daily energy expenditure in all age groups. In comparison, the 10% most active women only expend 22.1% (35–44 years old) to 15.8% (65–74 years old) in ≥ 4 BMR activities.

In all age groups, the majority of people perform not very high intensity activities (≥ 6 MBR) (median = 0%; shown in Appendix). In the Geneva population, these activities mainly include sports, with only a few men also performing occupations like very hard construction work. The percentiles

Figure 2 Percent of total energy expended in 3–3.9 BMR activities, according to gender and age groups. Square = P10, Diamond = P50, Octagon = P90; Solid lines = Men, Dashed lines = Women. Solid lines with crossbars to right of symbols = 95% confidence intervals

Figure 3 Percent of total energy expended in ≥ 4 BMR activities, according to gender and age groups. Square = P10, Diamond = P50, Octagon = P90; Solid lines = Men, Dashed lines = Women. Solid lines with crossbars to right of symbols are 95% confidence intervals

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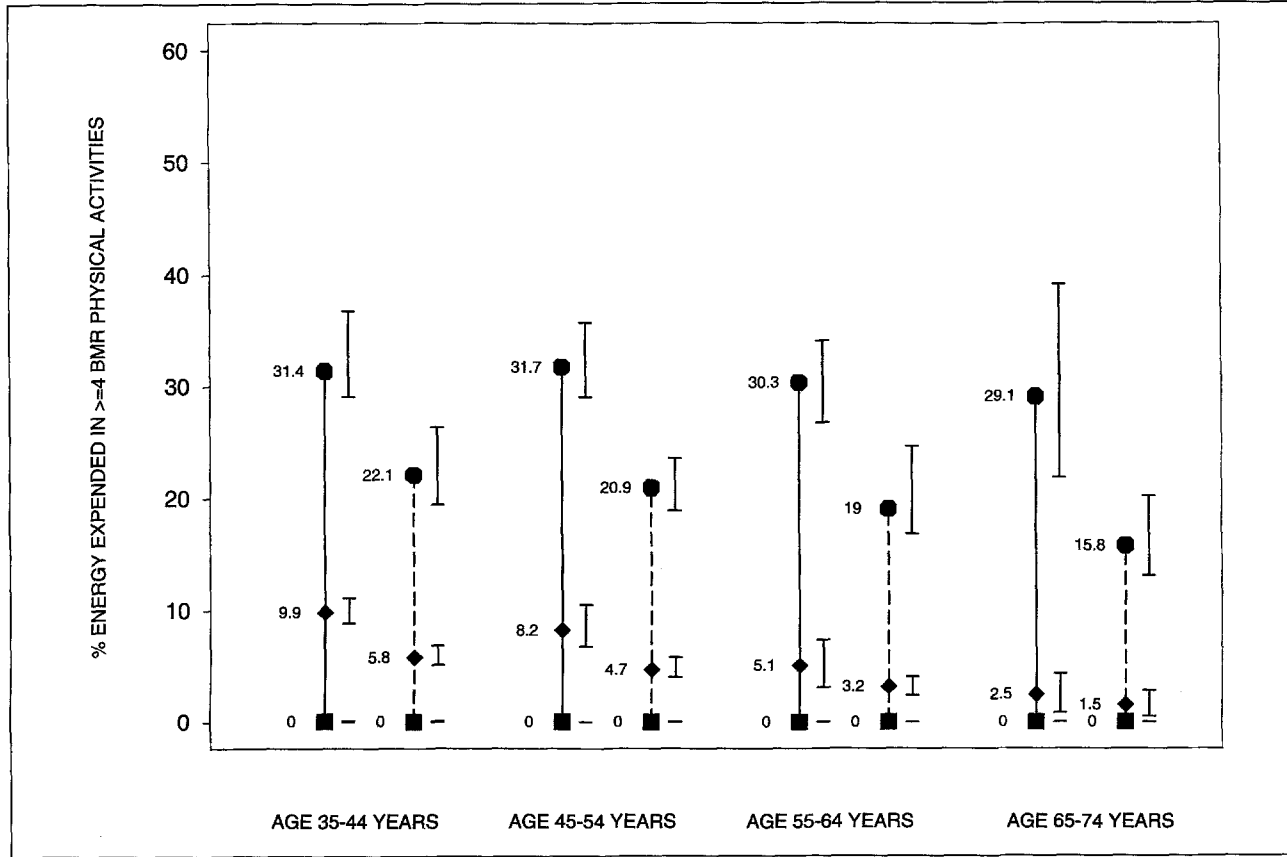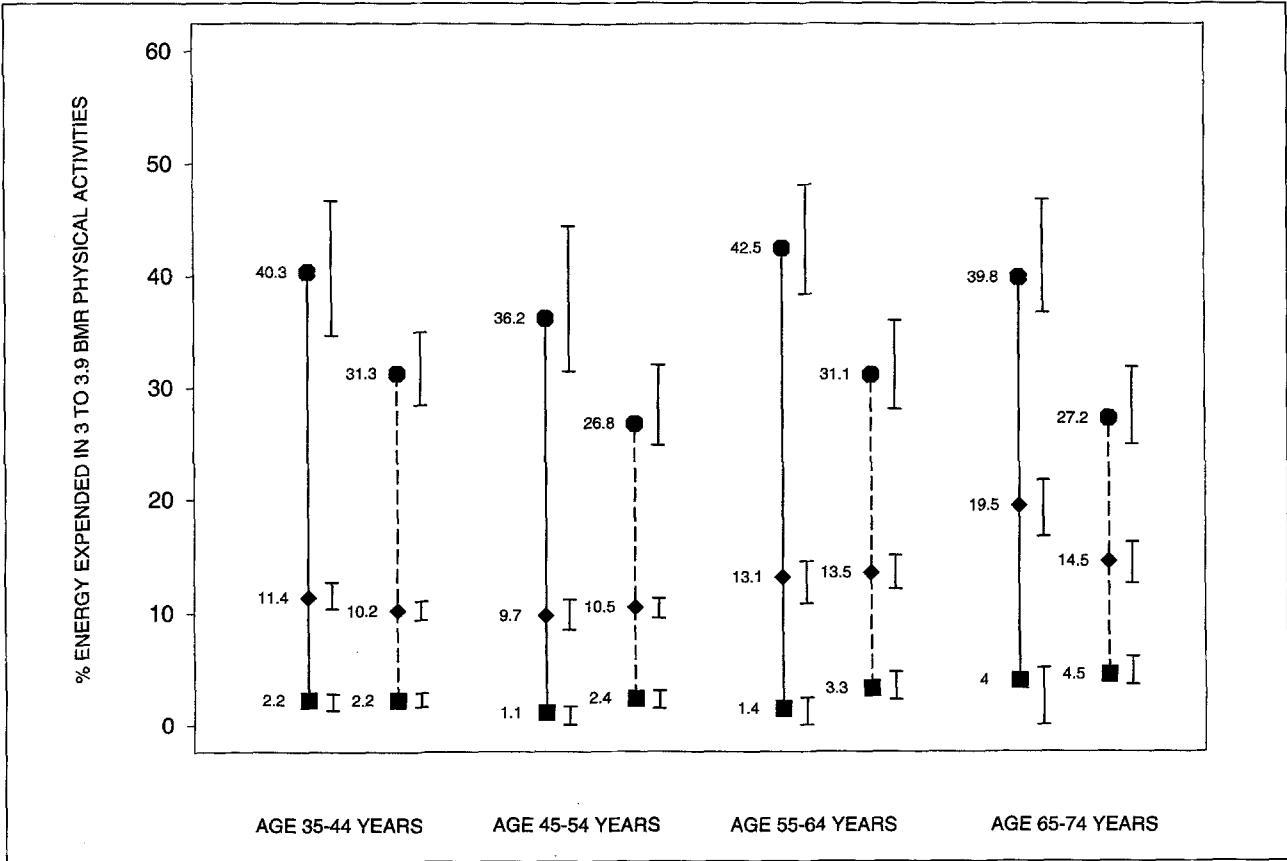
	Active (n = 741)	Sedentary (n = 966)	Adjusted OR**	95% CI***
Age group (years)				
35-44	36%	28%	1.0	
45-54	35%	30%	1.1	0.8-1.4
55-64	21%	26%	1.7	1.3-2.2
65-74	8%	16%	2.7	1.9-3.9
Education				
University	40%	34%	1.0	
Secondary	56%	57%	1.1	0.9-1.4
Primary	4%	8%	1.6	1.0-2.6
Country of birth				
Switzerland	61%	54%	1.0	
Others	26%	27%	1.2	0.9-1.5
Mediterranean	12%	20%	1.7	1.3-2.4
Cigarette smoking				
Never smoker	38%	32%	1.0	
Ex-smoker	39%	38%	1.0	0.8-1.3
Current smoker	24%	30%	1.5	1.2-2.0
Daily dietary fat				
<30%	24%	26%	1.0	
31-34%	25%	25%	1.1	0.8-1.4
35-39%	26%	24%	1.0	0.8-1.4
≥40%	26%	25%	1.0	0.8-1.4
Daily dietary fiber				
<11 g	24%	26%	1.0	
12-15 g	24%	26%	1.0	0.8-1.3
16-20 g	26%	25%	0.8	0.6-1.1
≥21 g	27%	24%	0.7	0.5-1.0

* Sedentary: < 10% energy expended in ≥ 4 BMR physical activities; Active: otherwise.
** Odds ratio from multiple logistic regression model adjusted for all other variables in table.
*** Confidence Interval

Table 2 Odds ratios of being sedentary* *versus* active*, in men (n = 1707), according to several risk factors. Geneva, 1997-1999

	Active (n = 512)	Sedentary (n = 1191)	Adjusted OR**	95% CI***
Age group (years)				
35-44	40%	34%	1.0	
45-54	36%	33%	1.2	0.9-1.5
55-64	18%	20%	1.4	1.0-1.9
65-74	8%	13%	2.2	1.5-3.3
Education				
University	43%	33%	1.0	
Secondary	54%	60%	1.2	1.0-1.6
Primary	2%	7%	2.3	1.2-4.6
Country of birth				
Switzerland	59%	54%	1.0	
Others	34%	30%	1.1	0.8-1.3
Mediterranean	7%	15%	2.3	1.5-3.5
Cigarette smoking				
Never smoker	54%	54%	1.0	
Ex-smoker	23%	23%	0.9	0.7-1.2
Current smoker	24%	24%	1.3	1.0-1.7
Daily dietary fat				
≤3%	27%	24%	1.0	
32-35%	25%	25%	1.1	0.8-1.5
36-39%	26%	29%	1.0	0.7-1.3
≥40%	22%	26%	1.2	0.9-1.7
Daily dietary fiber				
≤10 g	17%	28%	1.0	
11-14 g	25%	25%	0.6	0.4-0.8
15-20 g	28%	23%	0.5	0.4-0.7
≥21 g	29%	23%	0.5	0.3-0.6

* Sedentary: < 10% energy expended in ≥ 4 BMR physical activities; active: otherwise.
** Odds ratio from multiple logistic regression model adjusted for all other variables in table.
*** Confidence Interval.

Table 3. Odds ratios of being sedentary* *versus* active*, in women (n = 1703), according to several risk factors. Geneva, 1997-1999

P90 show that the 10% most active men expend about 16–23% of their energy in very high intensity activities and these percentages seem to remain identical with older age. In women however, the most active 10% expend only about 10–12% of their energy in very high intensity activities in the two youngest groups, but this percentage decreases to about 3–7% for the two oldest groups.

Correlates of sedentarism

Sedentarism increases with age in both genders (Tab. 2 and 3). A lower (primary) education, being born in Mediterranean countries, and being a current smoker increase the risk of sedentarism in men. Only a lower (primary) education and being born in Mediterranean countries, but not smoking, increase by two-fold the risk of being sedentary in women. Dietary fiber seems to be related to a lower risk of sedentarism, more in women (OR = 0.5, 95% CI = 0.3–0.6) than in men (OR = 0.7, 95% CI = 0.5–1.0).

Discussion

To our knowledge, this is the first time that the amount of total energy expenditure and its components, that is the several intensity levels of physical activities, are described in a general population. The major finding is the low prevalence of high and very high intensity activities (≥ 4 BMR) such as brisk walking (4 BMR), climbing stairs (6 BMR), and sports (≥ 6 BMR). Indeed, more than 10% of men and women are not performing any of these activities. For half of the population, these activities represent 10% or less in men and 7% or less in women, of the total energy expenditure; these proportions clearly decrease with older age. According to our definition, the prevalence of sedentarism is very high in Geneva (57% in men and 70% in women).

In a recent Swiss national survey[16], 500 Swiss adults were interviewed on the telephone about their usual activities relative to current recommendations. Results showed that 26% of the population reported performing at least 30 minutes per day of ≥ 4 BMR activities such as brisk walking and 37% of the population reported performing sports at least 3 times per week. The differences with the Geneva results may

be explained partly by the different methods used: the Swiss survey also included 15–24 and 25–34 year old people, who are more active than older individuals. On the phone, the interviewees were asked to evaluate the intensity of the activities performed and therefore they may have overestimated it. With the Geneva questionnaire, the interviewees responded to a list of activities without knowing how the intensity was rated. If we assume that only individuals reporting performing sports in the national study (37% of the interviewees) are not sedentary, then the national and Geneva results agree fairly well that the prevalence of sedentarism is about 60% in Switzerland.

The high prevalence of sedentarism may be related to the current epidemics of obesity and overweight in western countries[17,19] with their dramatic consequences[19-22]. The association between sedentarism and obesity[23-25] and the protective effect of physical activity[25-29] are well established. Prevalence of obesity and overweight in Geneva are, respectively, 13% and 45% in men and 9% and 24% in women. Diet cannot be the only reason for these high prevalences since total energy intake and proportion of fat in the diet have been decreasing in the recent past[30,31].

In the present results, sedentarism seems to be associated with country of birth. This is also true for other coronary heart disease risk factors as, for example, Italian-born women have a higher prevalence of overweight and obesity than Swiss women[18]. Country of birth may reflect behaviours, genetic factors, cultural habits, and social status. Education is also inversely and independently related to sedentarism. These results are consistent with the Swiss national survey (OFSP) which showed that differences linked to gender, age and socio-economic status are currently increasing.

The present sample has a rather low proportion of current smokers, and a high educational status; these results have been very consistent in the Geneva population since 1992[32]. A selection bias with respondents being more aware of health issues compared to the general population cannot be completely excluded, but in that case, the prevalence of sedentarism would be underestimated in the present report. The majority of the Geneva general population did not perform any very high intensity activities, mainly including sports. The prevalence is clearly decreasing with older age. Some elderly people may not be aware of their physical capabilities and the fun they may expect to derive from performing sports.

Promotion of high intensity activities (such as brisk walking) and sports should therefore focus not only on adults but also on children (to compensate for the effect of having a lower education), and on older people. Bicycling has been found to be one of the Geneva active people's favorite activities[10, 11]. Depending on the speed, it may be a sport but also an activity of ≥ 4 BMR which could be performed on an everyday basis, by most people. However, activities on public streets, such as walking and bicycling, are also associated with exposure to traffic accidents, especially for children and elderly people who are often compromised in sight, hearing, reaction time and muscle strength. Indeed, the strong support of the public authorities is necessary to promote both physical activity and security for all.

Conclusion

The majority of men and women in Geneva are sedentary. They perform no sports and few high intensity activities. Sedentarism is even more prevalent in older age, women and lower socio-economic status persons, as people from the highest socio-economic status are better informed about the importance of physical activity and have more resources to perform sports. Promoting physical activities therefore needs to target on children, adults and elderly, and on physical activities which would be both attractive and financially affordable by most people. Brisk walking, using stairs and bicycling are smart choices but need to be motivated and stimulated by major health promotion interventions. Activities on public streets require strong political support for making them safe and feasible throughout the city.

Zusammenfassung

Die körperliche Aktivität der erwachsenen Allgemeinbevölkerung: eine Erhebung in Genf

Fragestellung: Die Beschreibung der Verteilung der körperlichen Aktivität in der Bevölkerung ist von grosser Bedeutung für die öffentliche Gesundheitspflege.

Methoden: Eine von 1997–1999 in der Schweiz durchgeführte Erhebung auf Bevölkerungsebene erfasste mit 1707 Männer und 1703 Frauen eine Zufallsstichprobe der 35- bis 74-jährigen Genfer Bevölkerung. Die 10%-, 50%- (Median) und 90%-Perzentile dienen zur Beschreibung der Verteilung des gesamten Energieverbrauchs und der Anteile davon, die für moderate Aktivitäten (z.B. normales Laufen, Haushaltsarbeiten), welche 3- bis 3,9-mal den Grundumsatz (GU) verbrauchen sowie für intensive und hochintensive Aktivitäten (≥ 4 GU, z.B. schnelles Laufen, Treppensteigen, Sport) aufgewendet wurden.

Ergebnisse: Der Gesamtenergieverbrauch (Median Männer 2929 kcal/Tag, Frauen 2212 kcal/Tag) sank bei beiden Geschlechtern mit zunehmendem Alter. Die Prävalenz der sitzenden Lebensweise, definiert als weniger als 10% des Gesamtenergieverbrauchs durch Aktivitäten von ≥ 4 GU, betrug bei den Männern 57% und bei den Frauen 70%. Die Männer verbrauchten 12% ihrer Gesamtenergie mit Aktivitäten von 3–3,9 GU und 8% mit Aktivitäten von ≥ 4 GU. Die entsprechenden Prävalenzen bei den Frauen betrugen 11% und 5%. Die wenigen Männer (43%) und Frauen (31%) die hochintensive Aktivitäten ausübten (Sport oder berufliche Tätigkeiten ≥ 6 GU), verbrauchten im Durchschnitt 15% respektive 9% ihres Gesamtenergieverbrauchs durch diese Aktivitäten. Das Alter, Geschlecht, Herkunftsland, Geburtsland und die Ausbildung sind statistisch signifikante Einflussfaktoren für die Schwere der körperlichen Aktivität.

Schlussfolgerungen: Diese Erhebung zeigt, dass der Grossteil der Genfer Erwachsenen einen sitzenden Lebensstil pflegt und wenig oder keine Energie mit intensiven oder hochintensiven Aktivitäten verbraucht.

Résumé

L'activité physique de la population générale adulte: une enquête à Genève

Objectifs: La description de la distribution de l'activité physique dans la population est d'une importance primordiale pour la santé publique.

Méthodes: En 1997–1999, à Genève, Suisse, cette enquête a inclus 1707 hommes et 1703 femmes sélectionnés au hasard dans la population générale âgée de 35 à 74 ans. Les percentiles P10, P50 (médiane) et P90 résument la distribution de l'énergie totale dépensée, et des proportions de cette énergie utilisées en activités modérées (3 à 3,9 fois le métabolisme de base (MB), ex., marche normale, activités ménagères) et en activités intenses ou très intenses (≥ 4 MB, ex., marche rapide, sports).

Résultats: L'énergie totale dépensée (médiane 2,929 kcal/j chez les hommes, 2,212 kcal/j chez les femmes) décroît avec l'âge. La prévalence de la sédentarité, définie comme moins de 10% de l'énergie totale dépensée dans les activités de ≥ 4 MB, est de 57% chez les hommes et 70% chez les femmes. Les hommes dépensent 12% de leur énergie totale dans des activités de 3–3,9 MB et 8% dans des activités de ≥ 4 MB. Ces prévalences sont de 11% et 5% chez les femmes. La sédentarité est encore plus fréquente chez les femmes, les personnes âgées et de bas niveau de scolarité.

Conclusions: La majorité des Genevois est sédentaire. Promouvoir l'activité physique doit cibler les enfants, les adultes et les personnes âgées, en préférant les activités simples et financièrement abordables pour tous.

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Address for correspondence

Dr. Martine S. Bernstein
Division d'Epidémiologie Clinique
Hôpitaux Universitaires de Genève
25 rue Micheli-du-Crest
1211 Geneva 14
Switzerland

Tel.: +41-22 37 29 554

Appendix

Age (years)	n	Percentiles (P)					Mean (SD)
		P10	P25	P50	P75	P90	
Total energy expenditure (kcal/day)							
35–39	297	2527	2758	3035	3444	3920	3154 (575)
40–44	242	2518	2750	3142	3558	4085	3250 (715)
45–49	270	2514	2688	2987	3398	3800	3104 (638)
50–54	281	2438	2697	3010	3485	3972	3172 (752)
55–59	221	2395	2682	2970	3337	3861	3058 (561)
60–64	185	2027	2282	2580	2952	3473	2700 (631)
65–69	125	2117	2272	2486	2885	3345	2614 (503)
70–74	86	2071	2202	2429	2754	3067	2546 (540)
3 to 3.9 BMR* (%)							
35–39	297	2.3	5.1	11.7	21.0	37.6	16 (14)
40–44	242	1.9	5.2	11.2	21.4	45.2	17 (16)
45–49	270	1.0	4.3	9.2	18.1	32.6	14 (15)
50–54	281	1.5	4.3	10.3	20.9	36.6	16 (16)
55–59	221	1.7	4.8	10.8	20.8	42.9	16 (16)
60–64	185	1.3	6.4	14.7	29.9	41.5	19 (16)
65–69	125	2.7	9.0	20.4	31.4	38.9	21 (15)
70–74	86	5.1	9.8	17.5	29.0	40.9	20 (14)
≥ 4 BMR* (%)							
35–39	297	0.0	2.2	9.7	19.9	30.4	13 (13)
40–44	242	0.1	2.2	10.0	20.5	33.1	14 (15)
45–49	270	0.0	0.6	8.0	19.3	31.5	13 (14)
50–54	281	0.0	0.8	9.5	19.3	31.7	13 (16)
55–59	221	0.0	0.2	5.3	17.3	28.7	10 (16)
60–64	185	0.0	0.1	3.8	19.8	33.5	12 (15)
65–69	125	0.0	0.1	3.3	14.0	29.1	10 (14)
70–74	86	0.0	0.0	2.2	10.2	29.5	9 (14)
≥ 6 BMR* (%)							
35–39	297	0	0	1.3	9.1	19.4	6 (10)
40–44	242	0	0	0.0	10.2	20.6	6 (10)
45–49	270	0	0	0.0	9.7	21.3	7 (12)
50–54	281	0	0	0.0	10.2	22.9	7 (14)
55–59	221	0	0	0.0	7.0	17.1	5 (10)
60–64	185	0	0	0.0	7.7	23.6	7 (12)
65–69	125	0	0	0.0	7.5	19.5	6 (13)
70–74	86	0	0	0.0	2.9	16.2	4 (10)
Sleep time (hours)							
35–39	297	6.0	7.0	7.5	8.0	8.5	7 (1)
40–44	242	6.3	7.0	7.5	8.0	8.8	7 (1)
45–49	270	6.5	7.0	7.5	8.0	9.0	8 (1)
50–54	281	6.5	7.0	7.5	8.3	9.0	8 (1)
55–59	221	6.8	7.1	7.8	8.3	9.0	8 (1)
60–64	185	7.0	7.5	8.0	9.0	9.5	8 (1)
65–69	125	7.5	8.0	8.8	9.3	10.0	9 (1)
70–74	86	7.3	8.0	8.5	9.0	10.0	9 (1)

* BMR: Basal metabolism rate.

Table A1   Physical activity in men (n = 1707). Geneva,1997–1999.
Total energy expenditure and its distribution in moderate intensity activities (3 to 3.9 BMR*), high intensity activities (≥ 4 BMR*) and very high intensity activities (≥ 6 BMR*).

Age (years)	n	Percentiles (P)					Mean (SD)
		P10	P25	P50	P75	P90	
Total energy expenditure (kcal/day)							
35–39	349	1979	2106	2275	2526	2778	2329 (306)
40–44	258	1950	2079	2266	2504	2757	2319 (337)
45–49	278	1931	2072	2217	2491	2753	2297 (331)
50–54	284	1918	2063	2206	2495	2782	2291 (343)
55–59	186	1944	2044	2212	2507	2723	2296 (343)
60–64	149	1819	1941	2157	2353	2624	2185 (333)
65–69	128	1807	1911	2074	2275	2465	2100 (253)
70–74	71	1803	1872	2087	2223	2425	2091 (269)
3 to 3.9 BMR* (%)							
35–39	349	3.0	5.7	10.5	18.6	30.9	14 (12)
40–44	258	1.7	4.9	9.6	18.3	32.1	13 (12)
45–49	278	2.0	5.2	10.5	18.3	26.2	13 (12)
50–54	284	3.0	5.8	10.5	17.9	27.4	14 (12)
55–59	186	2.9	7.1	18.8	21.5	32.0	16 (12)
60–64	149	3.4	8.2	15.2	23.3	31.0	16 (11)
65–69	128	4.0	8.0	14.6	20.3	27.2	15 (10)
70–74	71	5.1	9.2	13.7	21.8	27.3	16 (10)
≥ 4 BMR* (%)							
35–39	349	0.1	1.5	6.6	13.4	23.0	9 (10)
40–44	258	0.0	0.2	5.2	11.8	22.0	8 (10)
45–49	278	0.0	0.4	4.6	13.6	23.0	9 (10)
50–54	284	0.0	0.6	4.8	11.2	19.3	8 (9)
55–59	186	0.0	0.2	4.0	10.8	19.5	8 (10)
60–64	149	0.0	0.1	1.8	11.3	18.2	7 (9)
65–69	128	0.0	0.1	2.3	8.7	16.7	6 (8)
70–74	71	0.0	0.0	0.6	6.4	12.2	4 (7)
≥ 6 BMR*							
35–39	349	0	0	0	4.1	12.6	3 (7)
40–44	258	0	0	0	3.4	10.5	3 (6)
45–49	278	0	0	0	3.4	11.5	3 (7)
50–54	284	0	0	0	2.7	9.5	3 (6)
55–59	186	0	0	0	0.0	6.9	2 (6)
60–64	149	0	0	0	0.0	5.8	2 (6)
65–69	128	0	0	0	0.0	4.6	1 (5)
70–74	71	0	0	0	0.0	3.2	1 (4)
Sleep time (hours)							
35–39	349	6.9	7.5	8.0	8.5	9.0	8 (1)
40–44	258	7.0	7.3	8.0	8.5	9.0	8 (1)
45–49	278	6.8	7.5	8.0	8.5	9.0	8 (1)
50–54	284	7.0	7.5	8.0	8.6	9.3	8 (1)
55–59	186	7.0	7.5	8.0	9.0	9.5	8 (1)
60–64	149	7.5	8.0	8.8	9.3	10.0	9 (1)
65–69	128	7.5	8.3	8.8	9.5	10.0	9 (1)
70–74	71	7.8	8.5	9.0	9.5	10.0	9 (1)

* BMR: Basal metabolism rate

Table A2 Physical activity in women (n = 1703). Geneva, 1997–1999
Total energy expenditure and its distribution in moderate intensity activities (3 to 3.9 BMR*), high intensity activities (≥ 4 BMR*) and very high intensity activities (≥ 6 BMR*).