


BMJ Open Association of sedentary behaviour patterns with dietary and lifestyle habits among public school teachers: a cross-sectional study

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ABSTRACT

Objectives To analyse the association of sedentary behaviour patterns with dietary and lifestyle habits among public school teachers.

Design Cross-sectional study.

Participants A sample of 245 teachers (186 women and 59 men) with mean age of 45.2 (\pm 10.4) were randomly selected from public schools.

Primary and secondary outcome measure Sedentary behaviour was assessed by hours spent watching television, computer and cellphone/tablet use and in sitting position. Sedentary breaks were reported in a Likert scale in domains of work and leisure time. Dietary habits were assessed by weekly consumption of fruits, vegetables, dairy products, fried foods, sweets, grains, cereals, white meat, soft drinks and snacks. Physical activity, smoking, alcohol consumption and socioeconomic status were assessed by using questionnaires.

Results The prevalence of high sedentary behaviour, high sedentary breaks at work and at leisure was 57.9%, 67.7% and 70.2% in the sample, respectively. No relationship was observed of high sedentary behaviour with dietary and lifestyle habits in adjusted analysis. However, high sedentary breaks at work were associated with high consumption of dairy products (OR=1.93 (CI 1.07 to 3.51)) and cereals (OR=2.49 (CI 1.05 to 5.92)) and with being high physically active (OR=2.57 (CI 1.14 to 5.77)). High sedentary breaks at leisure time were associated with high consumption of fruits (OR=2.33 (CI 1.28 to 4.23)) and vegetables (OR=1.91 (CI 1.05 to 3.49)) and with being high physically active (OR=2.34 (CI 1.03 to 5.35)). High sedentary breaks were associated with better dietary habits even among teachers with high sedentary behaviour.

Conclusion High sedentary breaks were associated with better dietary habits and with high levels of physical activity among public school teachers, even those with high sedentary behaviour.

INTRODUCTION

Sedentary behaviour is defined as the time spent in activities of energy expenditure of \geq 1.5 Metabolic equivalent of task - METs in seated, reclined or lying posture.¹ Nowadays,

Strengths and limitations of this study

- Cross-sectional design does not allow cause and effect inference in this study.
- Subjective assessment of physical activity and sedentary behaviour (questionnaire) did not allow a more robust evidence.
- A randomly selected sample and analyses controlled by sex, age and socioeconomic status.
- Physical activity and breaks in sedentary behaviour were assessed in domains of occupation and leisure time.
- The association of sedentary breaks in different domains with dietary habits among teachers has not been previously analysed in literature.

people spend much of their awake time on this type of activities, resulting in an increased sedentary behaviour both at work and leisure time.²

WHO report highlights that 3.2 million of deaths per year were attributed to sedentary lifestyle.³ Adult population spends around one-third to one-half of daily time in sedentary behaviour, with prolonged hours on screen devices as watching TV, using computers, participating in screen-based recreation or driving.⁴

The amount of time in sedentary behaviour has been widely evaluated in three ways: (i) checking for specific behaviours, such as television time; (ii) quantification of sedentary time in a specific domain (work, leisure or transportation); (iii) total time allocated to all manifestations of sedentary behaviour throughout the day.⁵ In this sense, a large proportion of daily sedentary behaviours has been accumulated at work environment, once studies observed office workers spend at least two-thirds of their working hours seated.^{6 7}

Besides, due to technological advances, sitting position has become a normative stance.⁸

Sitting time has been related to unhealthy dietary habits in adults.¹ Besides that, screen devices have been associated with exposure of food advertisements, which may lead to consumption of products of high energy density and low nutritional content.⁹ In this sense, the assessment of the relationship between sedentary patterns and dietary habits is important for public health, once adults with a healthy dietary pattern showed a more active lifestyle than those with unhealthy dietary patterns,¹⁰ and the association of physical activity and healthy dietary habits contributes to the prevention of diseases.¹¹

However, how life habits of predominantly non-sedentary workers is affected by the levels of sedentary behaviour is not consensual in literature, mainly among teachers. In Brazil, there are more than 2.6million teachers of basic and higher education, which represents a large professional category.¹² Besides that, teachers' workload is characterised by a considerable physical requirement, once these professionals remain for 95% of their work activities in orthostatic position.¹³ In addition, teachers perform a high demand of repetitive activities, most of them in ergonomically inadequate environments and in a complex nature of the teaching professional's role.¹⁴ Teachers therefore have a non-sedentary physical activity profile,¹⁵ and teachers are categorised as moderately active in their work functions.¹⁶

Nevertheless, physically active jobs can be associated with increased sitting time during leisure, and the relationship between occupation type and sedentary behaviour outside work needs further research.¹⁷ Besides that, frequent breaks in sedentary activities have been considered as an important strategy to mitigate the health impairments of sedentary behaviour, once sedentary breaks with light activities (ie, walking down the corridor to talk to co-workers or extending the distance walking to the restroom) can lead to important health benefits.¹⁸

Thus, this study aimed to analyse in the same research the relation between sedentary behaviour and breaks in sedentary time at work and leisure with dietary and lifestyle habits in public school teachers, controlled by confounding factors such as sex, age and socioeconomic status (SES).

METHODS

An observational study with cross-sectional design was performed according to the Ethics and Research Committee of University. All participants were duly informed about the objectives and procedures of the research and those who agreed to participate signed the informed consent term.

Sample selection and inclusion criteria

Sample was selected in the city of Presidente Prudente, which is located in the southern region of Brazil. There are about 207625 inhabitants in the city of Presidente

Prudente, which has a human development index of 0.846 (Brazilian Institute of Geography and Statistics, 2017).¹⁹ According to the City Department of Education, the number of public school teachers in the city is approximately 650, allocated in 23 schools.

Data collection was performed during the period of collective pedagogical work, at which time all teachers of the institution were present, so that it did not interfere in their pedagogical activities. The teachers were invited to participate for at least three times by the school manager. To participate in the research, the following inclusion criteria were adopted: (i) be an effective teacher (approved in civil service exam) or hired by the state education network; (ii) participate in all procedures (questionnaire, anthropometry) and sign the informed consent term.

Sample calculation

The minimum sample size was calculated for a greater research project about health behaviours in teachers, which considered a prevalence outcome of 50%, adopted in epidemiological studies with unknown prevalence or several outcomes,²⁰ a population of 650 public school teachers in the city, a CI of 95%, a test power of 80% and a tolerable error of 5%, which provided a simple random sample of 242 teachers. From all 23 schools in the city invited to participate, only 13 gave permission to collect the data; all the 13 schools were visited and all the teachers of these schools were invited to participate.

Organisation of data collection

Data collection was performed between the second semester of 2016 and first semester of 2017. The application of questionnaires was carried in the school environment by previously trained researchers, so that any doubts were promptly resolved. Evaluations of the anthropometric measurements (weight, height and waist circumference) were performed in a specific room provided by the school manager. In order to avoid possible constraints, male teachers were evaluated by a male researcher and female teachers by a female researcher.

Sedentary behaviour

The assessment of this variable was based on the Sedentary Behaviour Questionnaire,²¹ through the self-reported hours in a typical weekday and at weekend that teachers spent in television viewing, using the computer, using cell phone/tablet as well as in sitting time in a typical weekday. The responses were categorised into: (i) less than 1 hour (0hour computed); (ii) more than 1 hour but less than 2hours (1hour computed); (iii) more than 2hours but less than 3hours (2hours computed); (iv) more than 3hours but less than 4hours (3hours computed); (v) more than 4hours but less than 5hours (4hours computed); (vi) more than 5hours (5hours computed).

The mean of hours was calculated from a typical weekday and from a weekend day reported for each behaviour (television, computer, cellphone/tablet) and

the sedentary behaviour was calculated by the sum of the mean hours and total daily hours reported in sitting. The sample was classified as 'high sedentary behavior' and 'low sedentary behavior' according to cut-off point of 8 and more hours.²²

Breaks in sedentary behaviour at work and in leisure time were self-reported according to the following questions:

- ▶ In your work environment, how frequent do you get up to go to the bathroom, drink water or perform other activities that require standing or walking for at least a short time?
- ▶ In your leisure time, how frequent do you get up to go to the bathroom, drink water or perform other activities that require standing or walking for at least a short time?

The answers were presented on a Likert scale: (i) never; (ii) rarely; (iii) sometimes; (iv) often; and (v) always. The sample was divided into 'high sedentary breaks' (often, always) and 'low sedentary breaks' (never, rarely, sometimes) for each domain.

Anthropometry

Measurements of body mass, height and waist circumference were collected with participants being barefoot and wearing light clothing. Body mass was measured using a digital scale (Plenna brand) with an accuracy of 0.1 kg. Stature was evaluated by a portable stadiometer (Sanny brand, American Medical of Brazil) with a maximum extension of 2.20 m and precision of 0.1 cm. Waist circumference was collected through the middle point between the last rib and superior border of iliac crest²³ by an inextensible measuring tape with precision in millimetres and extension of 2 m.

Dietary habits, consumption of alcohol and smoking

Dietary habits were assessed by a food frequency questionnaire about the weekly frequency (days/week) consumption of fruits, vegetables, dairy products (ie, milk, yoghurt, cheese, creamy cheese), fried foods, sweets, grains (ie, bean, rice, pea, lentil, chickpea, soy), white meat or fish, soft drinks, snacks and cereals (ie, oat, granola, cornflakes). This instrument was based on questionnaire proposed by the Brazilian Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey,²⁴ which assess the frequency of consumption through the number of days per week and defines as regular consumption the frequency of ≥ 5 days per week for different types of food. In this sense, the food consumption was classified as high consumption (≥ 5 days/week) and 'low consumption' (4 or less days/week).

The consumption of alcohol and smoking was assessed through questions of the Brazilian Center of Information on Psychotropic Drugs.²⁵ The alcohol consumption questionnaire consisted of the frequency of alcoholic beverages consumed in the last 30 days and the number of doses per day. Teachers who report alcohol consumption

for at least 1–2 days/week and 1–2 doses per day were classified as 'high alcohol consumption'. The smoking habit was assessed by questions about the number of days smoked in the last 30 days, as well as the number of cigarettes per day. Teachers who reported smoking any cigarettes in the previous 30 days were considered as smokers. This type of instrument was previously used in epidemiological study.²⁶

Practice of physical activity

The practice of physical activity was evaluated by using Baecke Questionnaire.²⁷ This instrument evaluates the habitual practice of physical activities through three different domains (physical activity at work, physical activity in leisure and sports practice and physical activity outside work), presenting a dimensionless score that ranges from 1 to 5 points for each domain, providing a total score from 3 to 15 points through the sum of the three assessed domains. The cut-off point for classifying the individuals was defined by quartiles: 'high active' included those individuals who were in the highest quartile for the Baecke score (fourth quartile), 'moderately active' those located in intermediate quartiles (third and second quartiles) and 'less active' those subjects located in the first quartile.

Socioeconomic status

Brazilian Economic Classification Criteria²⁸ was used to assess the SES. This questionnaire takes into account the degree of education, and the presence and quantity of certain rooms and goods in the home (television, DVD, radio, bathroom, car, washing machine, freezer). The instrument classifies the sample by scores into classes from the highest to lowest: A1, A2, B1, B2, C1, C2, D and E. The sample was further classified as high SES (A1, A2), medium SES (B1, B2, C1) and low SES (C2, D, E).

Statistical analysis

Data distribution was assessed by Kolmogorov-Smirnov test and, due to non-normal distribution, the characteristics of sample were expressed as median and IQR. The median differences were verified by the Wilcoxon rank test for dependent samples and by Mann-Whitney U test for independent samples. The correlation between breaks in sedentary behaviour with sedentary time in different domains was analysed by Spearman correlation coefficient. The association of high sedentary behaviour and breaks in sedentary time with independent variables (dietary habits, smoking, alcohol consumption and physical activity) were evaluated by the χ^2 test. Variables with associations of $p \leq 0.200$ were considered in the multiple model, performed by binary logistic regression adjusted by sex, age and socioeconomic condition. For a clustering analysis of sedentary behaviour and breaks, the sample was divided into three groups: high sedentary behaviour with low sedentary breaks (group 1), high sedentary behaviour with high sedentary breaks (group 2) and low sedentary behaviour (group 3). Statistical significance

Table 1 Characterisation of the sample according to sedentary behaviour level in public school teachers

Variable	Low SB	High SB	P value*
	Median (IR)	Median (IR)	
Age (years)	49.0 (12.0)	45.0 (17.0)	0.017
Body mass index (kg/m ²)	26.5 (7.4)	27.2 (7.8)	0.445
Waist circumference (centimetres)	85.0 (20.0)	88.0 (21.0)	0.334
Fruits (days/week)	5.0 (4.0)	5.0 (4.0)	0.330
Vegetables (days/week)	6.0 (3.0)	6.0 (4.0)	0.307
Dairy products(days/week)	7.0 (4.0)	5.0 (5.0)	0.164
Fried foods (days/week)	1.0 (1.0)	1.0 (1.0)	0.216
Sweets (days/week)	3.0 (4.0)	3.0 (4.0)	0.794
Grains (days/week)	7.0 (1.0)	7.0 (2.0)	0.160
Cereals (days/week)	2.0 (4.0)	2.0 (3.0)	0.500
White meat (days/week)	4.0 (3.0)	3.0 (3.0)	0.354
Soft drinks (days/week)	1.0 (2.0)	1.0 (2.0)	0.122
Snacks (days/week)	0.0 (0.0)	0.0 (1.0)	0.003
Alcoholic beverages (doses/day)	0.0 (1.0)	0.0 (3.0)	0.001
Smoking (cigarettes/day)	0.0 (0.0)	0.0 (0.0)	0.595
Physical activity (Baecke score)	7.3 (2.4)	7.4 (2.2)	0.369
Breaks in SB at work (frequency)	4.0 (2.0)	4.0 (2.0)	0.741
Breaks in SB at leisure time (frequency)	4.0 (2.0)	4.0 (1.0)	0.907

*P value for Mann-Whitney U test.

IR, Interquartile range; SB, sedentary behaviour.

was fixed at 5% and the 95% CI was adopted, with analyses in the software SPSS V.15.0.

Patient and public involvement

Patients and the public were not involved in the design or planning of the study.

RESULTS

The sample consisted of 245 individuals (~38% of the public school teachers from the city), with 186 females (76%), 59 males (24%) and a mean age of 45.2 (± 10.4) years. The prevalence of high SES was 5.7% in the sample, followed by 91.0% of medium SES, and 3.3% of low SES. A prevalence of 57.9% of the sample was classified as high sedentary behaviour. Median values of sedentary behaviour in a typical weekday and at weekend were the same in the sample (6.0 hours (IQR=6.0), p value for Wilcoxon rank's test=0.360); however, higher values of television viewing and lower values of computer use at weekend than weekday were observed (p value for Wilcoxon rank test=0.001 for both). **Table 1** presents information regarding sample characterisation according to low and high sedentary behaviour. Teachers with high sedentary behaviour presented lower age (p=0.017) and higher consumption of snacks (p=0.003) and alcoholic beverages (0.001) than teachers with low sedentary behaviour.

Table 2 presents relation between prevalence of high sedentary behaviour and high consumption of foods and lifestyle habits. It was observed a higher prevalence of high sedentary behaviour among teachers with high consumption of alcoholic beverages than those with low alcoholic beverages consumption (67.0% vs 50.0%).

Table 3 presents the magnitude of associations between high sedentary behaviour and variables with a p value ≤ 0.200 in χ^2 analysis. No significant relationship was observed after adjustment for confounding factors (sex, age and SES).

Table 4 shows the associations of breaks in sedentary behaviour at work and at leisure time with dietary and lifestyle habits. High breaks in sedentary behaviour were reported by 67.7% of sample in the work domain and 70.2% at leisure time. It was observed that teachers with high breaks in sedentary behaviour at work were almost twice as likely to have high consumption of dairy products, 2.5 times more likely to have high consumption of cereals and 2.6 times more likely to be moderately and high active. When considering breaks in sedentary behaviour at leisure time, teachers who reported high sedentary breaks were more likely to have high consumption of fruits and vegetables, and more likely to be high actives. The correlation coefficient between breaks at work and breaks at leisure time was 0.408 (p value for Spearman=0.001). According to sedentary time, the amount of breaks at

Table 2 Relation of high sedentary behaviour with dietary and lifestyle habits in public school teachers

	Total (n=245) n	High sedentary behaviour (n=142) n (%)	χ^2 value	P value
Fruit				
Low consumption	108	68 (63.0)	2.278	0.131
High consumption	135	72 (53.3)		
Vegetable				
Low consumption	77	46 (59.7)	0.245	0.621
High consumption	165	93 (56.4)		
Dairy product				
Low consumption	93	58 (62.4)	1.262	0.261
High consumption	149	82 (55.0)		
Fried Food				
Low consumption	221	124 (56.1)	2.212	0.137
High consumption	19	14 (73.7)		
Sweet				
Low consumption	167	92 (55.1)	1.392	0.238
High consumption	76	48 (63.2)		
Grains				
Low consumption	41	27 (65.9)	1.353	0.245
High consumption	200	112 (56.0)		
Cereal				
Low consumption	198	116 (58.6)	0.795	0.372
High consumption	43	22 (51.2)		
White meat				
Low consumption	167	101 (60.5)	2.301	0.129
High consumption	74	37 (50.0)		
Soft drink				
Low consumption	225	130 (57.8)	0.014	0.905
High consumption	16	9 (56.3)		
Snack				
Low consumption	235	135 (57.4)	0.103	0.748
High consumption	3	2 (66.7)		
Alcoholic beverage				
Low consumption	136	68 (50.0)	7.135	0.008
High consumption	109	73 (67.0)		
Smoking				
Non-smoker	229	131 (57.2)	0.365	0.546
Smoker	17	11 (64.7)		
Physical activity				
Less active	53	35 (58.3)	1.401	0.496
Moderately active	128	40 (63.5)		
High active	65	67 (54.5)		

work was correlated to computer use ($r=0.126$, $p=0.049$), cell phone/tablet ($r=0.171$, $p=0.007$) and sitting time ($r=-0.185$, $p=0.007$). No correlation between breaks at

home and domains of sedentary behaviour was observed in Spearman correlation coefficient test.

Table 5 presents a clustering association analysis of different patterns of sedentary behaviour with dietary and



Table 3 Multivariable-adjusted ORs and 95% CIs for association between high sedentary behaviour and independent variables in teachers

	OR	95% CI	P value
Fruit			
Low consumption	1.00	Reference	—
High consumption	0.84	0.48 to 1.46	0.534
Fried food			
Low consumption	1.00	Reference	—
High consumption	1.54	0.51 to 4.63	0.445
White meat			
Low consumption	1.00	Reference	—
High consumption	0.67	0.38 to 1.20	0.179
Alcoholic beverage			
Low consumption	1.00	Reference	—
High consumption	1.63	0.95 to 2.81	0.076

Adjusted for sex, age and socioeconomic status.

lifestyle habits of public school teachers. Teachers with high sedentary behaviour, but with high sedentary breaks at work and leisure (group 2) were 3.38 times more likely to have high consumption of fruits than those teachers with high sedentary behaviour and low sedentary breaks (group 1). The odds to have high consumption of fruits were also higher among teachers with low sedentary behaviour (group 3) when compared with the first group. Teachers located into group 2 were 3.6 times more likely to have high consumption of dairy products and 2.3 times more likely to be highly active when compared with group 1. These results were observed independently of sex, age and SES.

DISCUSSION

This study observed a prevalence of 58% of high sedentary behaviour in public school teachers. However, teachers with high breaks in sedentary behaviour were associated with better dietary habits and physical activity, even among those with high sedentary behaviour, independently of sex, age and SES.

The sample of this study consisted a majority of females (76%), which appears to be a trend in the area of basic education. This could be a reflection of the insertion of women in the work environment, from the second half of the twentieth century, especially in functions of teaching and nursing, considered as care functions and an extension of domestic activities.¹³ It should be highlighted that, according to UNESCO,²⁹ the prevalence of Brazilian female teachers is 81.3%, being even higher than in this study.

The majority of females in the study sample revealed a possible common scenario for other studies involving teachers: the presence of double tasks (school and domestic). This factor may be responsible for the

decrease in women's health, leading to insufficient time for leisure, rest and hours of sleep, which would imply high levels of stress, less time to perform physical activities and a greater probability of alcohol consumption.¹²

The prevalence of alcohol consumption was high in the sample (44.4%). Therefore, the peculiarities of teaching career, coupled with the double tasks of women, may suggest reasons for the high consumption of alcoholic beverages, being further aggravated by the report of association of sedentary behaviour with alcohol consumption and unhealthy dietary pattern in earlier study.³⁰ These findings meet the results of this study, once teachers with high alcohol consumption showed higher prevalence of high sedentary behaviour than teachers with low alcohol consumption (67.0% vs 50.0%). It was also observed that alcohol consumption associated with television viewing time were factors that encourage excessive eating,³¹ which may impair even more the dietary habits of teachers with high sedentary behaviour and high alcohol consumption over time.

In this study, teachers with high breaks in sedentary behaviour at work were more likely to have high consumption of dairy products and cereals, and more likely to be physically active. Regarding breaks in sedentary behaviour at leisure time, teachers who report high breaks in this domain were more likely to have high consumption of fruits and vegetables, and more likely to be physically active. Convergingly with healthy eating habits as observed, the frequent sedentary breaks at work and leisure have been associated with lower metabolic risk, in regard to adiposity triglyceride levels.³² Another important factor is that breaks in sedentary behaviour may be performed even by light intensity activities and it is known that light intensity physical activity increases the metabolic rate and the energy cost of daily activities, which can significantly contribute to increase energy expenditure.³³ By this way, teachers with higher physical activity practice, even in light intensity, may present greater physical fitness to withstand physiological workloads than those who were predominantly sedentary, and may perceive the standing time along the teaching activities as less intensely.¹⁴

This study compared the dietary habits according to groups with different sedentary behaviour patterns. The high breaks in sedentary behaviour contribute to an increase in the chance of high consumption of fruits and cereals even among teachers with high sedentary behaviour. A possible hypothesis is that breaks in sedentary time may provide opportunities to have more access to healthy food choices, which are not always available in the sedentary setting, whether at work or at leisure. Another hypothesis is that the fragmentation of sedentary behaviour may mitigate the influence of sedentary behaviour on unhealthy dietary habits.

High breaks in sedentary behaviour were also associated with higher chance of being highly active among teachers with high sedentary behaviour, which was not observed in teachers with low sedentary behaviour. This observation

Table 4 Multivariable-adjusted ORs and 95% CIs for association between high breaks in sedentary behaviour with dietary and lifestyle habits in public school teachers

	High breaks in SB at work (n=166)			High breaks in SB at leisure time (n=172)		
	OR	95% CI	P value	OR	95% CI	P value
Fruit						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.62	0.90 to 2.92	0.108	2.33	1.28 to 4.23	0.005
Vegetable						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.63	0.89 to 3.01	0.116	1.91	1.05 to 3.49	0.035
Dairy product						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.93	1.07 to 3.51	0.029	1.36	0.76 to 2.44	0.298
Fried food						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	0.89	0.29 to 2.73	0.838	0.94	0.32 to 2.73	0.947
Sweet						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.10	0.60 to 2.05	0.743	1.21	0.65 to 2.24	0.541
Grains						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.77	0.87 to 3.58	0.115	1.11	0.53 to 2.33	0.773
Soft drink						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	0.67	0.21 to 2.19	0.518	0.48	0.16 to 1.44	0.193
Cereal						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	2.49	1.05 to 5.92	0.038	2.04	0.87 to 4.80	0.100
White meat						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	0.61	0.33 to 1.13	0.120	1.14	0.61 to 2.12	0.678
Alcoholic beverage						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	0.97	0.55 to 1.72	0.929	0.95	0.53 to 1.68	0.951
Smoking						
Low consumption	1.00	Reference	—	1.00	Reference	—
High consumption	1.00	0.32 to 3.08	0.995	0.84	0.30 to 2.41	0.751
Physical activity						
Less active	1.00	Reference	—	1.00	Reference	—
Moderately active	2.60	1.28 to 5.28	0.008	1.75	0.87 to 3.55	0.116
High active	2.57	1.14 to 5.77	0.022	2.34	1.03 to 5.35	0.043

Adjusted for sex, age, and socioeconomic level.
SB, sedentary behaviour.

reinforces the concept that sedentary behaviour and sufficient levels of physical activity were not an inverse of each other.³⁴ Besides that, breaks in sedentary behaviour may lead to better healthy habits as healthy foods consumption

and physical activity engaging even among those with high sedentary behaviour.

This study is limited by its cross-sectional design, which prevents the analysis of cause and effect. The self-report

Table 5 Multivariable-adjusted ORs and 95% CIs for clustering association of different sedentary behaviour patterns with independent variables in public school teachers

	Group 1			Group 2			Group 3		
	High SB +low breaks (n=65)			High SB +high breaks (n=77)			Low SB (n=103)		
	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value
High consumption of fruit	1.00	Reference	—	3.38	1.61 to 7.10	0.001	2.24	1.14 to 4.42	0.020
High consumption of vegetable	1.00	Reference	—	1.90	0.90 to 4.01	0.091	1.38	0.69 to 2.73	0.362
High consumption of dairy product	1.00	Reference	—	1.92	0.94 to 3.91	0.072	1.64	0.85 to 3.19	0.142
High consumption of fried food	1.00	Reference	—	0.76	0.24 to 2.42	0.636	0.59	0.17 to 1.42	0.188
High consumption of sweet	1.00	Reference	—	1.49	0.72 to 3.07	0.284	0.99	0.49 to 2.01	0.971
High consumption of grains	1.00	Reference	—	1.48	0.63 to 3.50	0.363	2.13	0.93 to 4.91	0.076
High consumption of cereal	1.00	Reference	—	3.59	1.19 to 10.86	0.024	2.81	0.97 to 8.17	0.057
High consumption of white meat	1.00	Reference	—	0.83	0.39 to 1.79	0.635	1.36	0.67 to 2.73	0.394
High consumption of soft drink	1.00	Reference	—	0.37	0.09 to 1.59	0.182	0.85	0.25 to 2.91	0.791
High consumption of snack	1.00	Reference	—	0.83	0.05 to 14.08	0.899	0.82	0.05 to 14.13	0.892
High consumption of alcohol	1.00	Reference	—	1.09	0.55 to 2.16	0.803	0.64	0.33 to 1.24	0.186
Be a smoker	1.00	Reference	—	1.06	0.30 to 3.73	0.927	0.99	0.28 to 3.51	0.987
Be high active*	1.00	Reference	—	2.34	1.05 to 5.22	0.037	1.84	0.84 to 4.04	0.128

Analysis adjusted by sex, age and socioeconomic status. High SB=SB of 8 and more hours/day; low SB below 8 hours/day; low breaks=reported to break SB never, rarely or sometimes for both work and leisure time domains; high breaks=reported to break SB often or always for both work and leisure time domains.

*Fourth quartile of Baecke score. Bold values are statistically significant. SB, sedentary behaviour.

assessment of variables is another factor to be considered and may be vulnerable to biases. Sitting time was assessed in overall and its measurement in different domains will provide major inferences. Besides, due to this study having assess only to teachers, the inference about lifestyle behaviours of other workers is another important limitation, which does not allow to compare different groups of workers in regard to the same variables and consequently to extrapolate the findings to other populations. Another important limitation was the lack of assessment about how many servings per day was consumed for each food, being assessed only the frequency in days per week. Otherwise, advancements in this study were the assessment of the different sedentary patterns in a specific and important category of workers, who perform light intensity physical activities during almost all their work time, where most studies concentrate their efforts and investigation on how sedentary behaviour and lifestyle habits are associated. It should also be noted that data collection was performed face-to-face survey, and anthropometry was objectively measured in the workplace, which allows higher veracity of information.

In conclusion, this study observed no independent association of sedentary behaviour with dietary habits and lifestyle factors among teachers; however, high breaks in sedentary behaviour were associated with healthier dietary habits (ie, high consumption of fruits, vegetables, dairy products and cereals) and with high levels of physical activity. These positive results were observed even among teachers with high levels of sedentary behaviour,

when compared with those with high sedentary behaviour and low breaks in sedentary behaviour. Further investigation are needed to extrapolate these results to other types of workers and to analyse these associations over the time. However, evidence-based information about teachers is helpful to lead positive behavioural health changes of this large sample of workers, as well as to all the people who are dependent on their professional acting.

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Patient consent for publication Not required.

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