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## LETTER TO THE EDITOR

### Physical activity behaviour in people with diabetes residing in China: A cross-sectional analysis



### *L'activité physique chez les personnes diabétiques résidants en Chine: l'analyse transversale*

#### 1. Introduction and methods

China has the highest number of people with diabetes in the world (50.2 million men and 42.2 million women), a prevalence of 9.7% (10.6% men and 8.8% women) [1]. The good management of diabetes to reduce diabetic related complications is of paramount importance. Several studies have identified a central role of physical activity (PA) in the management of diabetes [2]. For example, some studies have found that PA may have a protective effect in eye complications, such as diabetic retinopathy [3]. However, some studies have reported that only 10% of people with diabetes participate in PA [4]. Interventions targeting PA promotion in populations with diabetes are needed. However, before such interventions are implemented, it is important to know the PA behaviour for whom the intervention is to be designed. At present, there is a paucity of studies exploring this issue in those with diabetes residing in China. The aim of the present study is to analyse PA behaviour in adults with diabetes residing in Hangzhou, China, according to their demographic, physical and behavioural characteristics.

One hundred and ninety-nine adults ( $56.7 \pm 11.0$  yr) with diabetes attending a diabetic eye clinic in China were recruited into the study (characteristics of the sample in Table 1). Ethical approval was granted by the Ethics Committee of the Second Affiliated Hospital, School of Medicine, Zhejiang University. All patients provided informed consent. Participants were treated in accordance with the Declaration of Helsinki. Participants self-reported: sex, age, marital status, education level, type of diabetes, years since diagnosis of diabetes, and lifestyles habits (smoking and alcohol). A trained research assistant collected data on: fasting blood

sugar level, retinopathy levels and visual acuity. Also, participants were asked: Do you think PA is important to control diabetes? Response options were "yes/no". Practice of PA, was evaluated through the question: Do you do PA such as vigorous walking, swimming, etc.? Response options were "yes/no". Descriptive statistics for characteristics of the sample, chi-squared analyses for proportions to determine differences, and logistic regression to examine associations between exposure and outcome variables (models were mutually adjusted for all exposure variables) were carried out. Statistical significance was set at  $P \leq 0.05$ .

#### 2. Results and discussion

In total, 72.4% thought that PA was important in the control of diabetes and 71.4% participated in PA. Differences in the level of PA were not found according to sex, age, marital status, type of diabetes, years since diagnosis of diabetes, fasting blood sugar, retinopathy, smoking and alcohol. However, those with higher educational level and those with higher visual acuity in their good eye gave more importance to PA (both  $P < 0.05$ ; Table 1). In adjusted logistic regression models, those who thought that PA was important to control diabetes were more than 3 times more likely to participate in PA when compared to those who did not consider PA important (OR 3.24, 95% CI 1.57 to 6.70).

Our findings support previous literature carried out in people with diabetes residing in other locations, relating to the awareness of the benefits of PA. For example, Brassill et al. [5] found in a sample of 115 people with diabetes residing in Ireland that 90% reported an awareness of the benefits of PA in diabetes control. However, in China, targeted interventions to raise awareness of the benefits of PA in the control of diabetes in those with a lower level of education are warranted. Regarding levels of PA in those with diabetes, our findings both support and contradict previous literature. These differences may be explained by the social and political context of the countries studied and/or differences between measurements of PA (self-report or objective means).

**Table 1** Consideration and practice of physical exercise according to exposure variables.

	Do you think physical activity is important to control diabetes?	Do you do physical activity such as vigorous walking, swimming, etc.?
Total sample ( <i>n</i> = 199)	144 (72.4)	142 (71.4)
Sex		
Women: 101 (50.7)	74 (73.3)	74 (73.3)
Men: 98 (49.3)	70 (71.4)	68 (69.4)
Age		
<60: 120 (60.3)	84 (70.0)	83 (69.2)
>60: 79 (39.7)	60 (75.9)	59 (74.7)
Marital status		
Married: 192 (96.5)	137 (71.4)	137 (71.4)
Not married: 7 (3.5)	7 (100.0)	5 (71.4)
Education level*		
University: 18 (9.0)	17 (94.4)*	13 (72.2)
No University: 181 (91.0)	127 (70.2)*	129 (71.3)
Type of diabetes		
1: 18 (9.1)	10 (55.6)	11 (61.1)
2: 180 (90.9)	133 (73.9)	130 (72.2)
Years since diagnosis of diabetes		
<10: 98 (49.2)	68 (69.4)	68 (69.4)
>10: 101 (50.8)	76 (75.2)	74 (73.3)
Fasting blood sugar level <sup>a</sup>		
Normal: 99 (50.8)	76 (76.8)	69 (69.7)
High: 96 (49.2)	66 (68.8)	70 (72.9)
Retinopathy		
No: 40 (20.1)	28 (70.0)	31 (77.5)
Yes: 159 (79.9)	116 (73.0)	111 (69.8)
Visual acuity good eye*		
>0.5 LogMAR: 100 (50.3)	79 (79.0)*	76 (76.0)
<0.5 LogMAR: 99 (49.7)	65 (65.7)*	66 (66.7)
Visual acuity worse eye		
>0.5 LogMAR: 48 (24.1)	38 (79.2)	37 (77.1)
<0.5 LogMAR: 151 (75.9)	106 (70.2)	105 (69.5)
Smoking		
No: 173 (86.9)	125 (72.3)	126 (72.8)
Yes: 26 (13.1)	19 (73.1)	16 (61.5)
Alcohol		
No: 171 (85.9)	123 (71.9)	123 (71.9)
Yes: 28 (14.1)	21 (75.0)	19 (67.9)

Affirmative answers: n° (%).

\* Significant differences ( $P < 0.05$ ).

<sup>a</sup> High fasting blood sugar level:  $\geq 7.2$  mmol/L.

In this study, no differences were found between PA participation and health-related variables (fasting blood sugar level, retinopathy levels, visual acuity). This is surprising as level of PA has previously been found to be associated with visual impairment and fasting blood glucose [2]. This may be owing to those who said they did PA did not meet PA guidelines for people with diabetes (at least 150 min of moderate to vigorous PA per week) [2] and thus did not acquire health benefits. Moreover, our sample contained a very high proportion of individuals with diabetic retinopathy (79.9%), who are likely to score worse on visual acuity.

In conclusion, it is recommendable to implement programs to raise awareness of the importance and benefits of PA in the control of diabetes among those with diabetes

residing in China, and these programs should focus on those with lower educational level.

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## Disclosure of interest

The authors declare that they have no competing interest.

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