KNOWLEDGE, ATTITUDE AND PRACTICE OF TYPE 2 DIABETES ON PHYSICAL ACTIVITY

ABSTRACT

Education is the cornerstone of diabetes care. Due to lack of awareness, most patients suffer from diabetes complications. This study was conducted to determine knowledge, attitudes and practices among patients with type 2 diabetes.

This descriptive cross-sectional study included type 2 diabetics in some medical facilities in the city of Kisangani. Patients were interviewed using a structured questionnaire. The mean age of patients was 42.5 years male/female.

In terms of knowledge, endurance sport was the most represented in all the surveys with 75%. With regard to the practical attitude, 92% of respondents did not practice physical activity. The cause of not practicing was more related to laziness with 38%.

The attitude and practice of type 2 diabetics remain inadequate in our environment and deserve to be improved during therapeutic education.

Keywords : knowledge, attitude, practice, diabetic and Kisangani.

INTRODUCTION

Diabetes mellitus is a serious chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates the concentration of blood sugar, or glucose), or when the body does not properly use the insulin it it produces [1].

It constitutes a major public health problem and is one of the four priority non-communicable diseases targeted for intervention by world leaders [1].

The main types of diabetes are: type 1 diabetes (insulin-dependent or juvenile diabetes) characterized by an inability of the pancreas to produce insulin essential for survival and type 2 diabetes (or adult diabetes) which results inadequate use of insulin by the body [2]. Physical exercise can be prescribed to lower the level of blood sugar in a person with type 2 diabetes. Muscular exercise can increase the extraction

of glucose from the blood by 7 to 20 times, which effectively helps to reduce blood sugar [3].

The World Health Organization (WHO) predicts that by 2030, diabetes will be the 7th leading cause of death worldwide. Having a healthy diet, regular physical activity, a normal weight and avoiding tobacco consumption are ways to prevent or delay the onset of type 2 diabetes. Type 2 diabetes represents the majority of diabetes encountered in the world. It is largely the result of overweight and physical inactivity [4].

Diabetes mellitus is a debilitating and costly chronic disease that affected 425 million people in 2017 according to the International Diabetes Federation (IDF), 382 million people worldwide and is responsible for 5.1 million deaths each year and more. one million amputations [2]. According to the IDF, the disease will affect more than 550 million people in 2030, becoming one of the leading causes of disability and death worldwide [2].

Epidemiological studies carried out in Africa show that diabetes mellitus is often unrecognized (2-3 undiagnosed cases for each known case). In addition, type 2 diabetes is often associated with arterial hypertension, abdominal obesity and dyslipidemia in the context of the metabolic syndrome. Although so far dyslipidemias have not been a significant problem in the region, but it could be different in the future [5].

In the Democratic Republic of Congo (DRC), the prevalence of diabetes, reported in a few fragmentary studies, varies between 3.5 and 14%. In 2016, approximately 23,000 deaths were either due to diabetes or high blood sugar. Despite the scarcity of data, the DRC is expected to experience, like other countries in sub-Saharan Africa (SAA), an exponential increase in cases of type 2 diabetes in the coming years. This would be linked to the westernization of lifestyle. The implementation of recommendations on good clinical practices based on evidence for the management of type 2 diabetes is necessary insofar as it facilitates the management of sick people scattered across this vast country [6].

Type 2 diabetes says maturity seat of overweight. The treatment aiming at a return to a normal life without discrimination, takes into consideration the individual, his environment, and his integration. To this end, care is based on a triptych : diet,

physical activity and medication. The medical objectives are to be considered in the short, medium and long term in order to limit and prevent the complications of diabetes. This requires informing and educating patients so that they actively participate in the management of the disease [7].

It is in this perspective that we will conduct this study to assess the knowledge, attitudes and practices of type 2 diabetics on physical activity.

The general objective of this study was to assess the level of knowledge, attitudes and practices of type 2 diabetics on physical activity. Its specific objectives were: to determine the knowledge of diabetics on the practice of physical activity; identify the most practiced physical activity; cite the main obstacles of patients faced with physical exercise; determine the duration per session and the weekly frequency of patients practicing physical activity.

MATERIAL AND METHODS

Framework and period of study

The Internal Medicine service of the various medical structures of the city of Kisangani was selected from October 01, 2022 to January 01, 2023, namely: General Reference Hospital (HGR)/Makiso-Kisangani, HGR/Kabondo, HGR/Lubunga , HGR/Mangobo, HGR/Tshopo, Kisangani University Clinics (CUKIS), Heshima hospital, Shukrani and Center for Women's Development and Hope.

Type of study

This was a descriptive cross-sectional study with prospective data.

Study target population

It was made up of adult diabetic patients of both sexes, cared for in the internal medicine department of the various medical structures selected for this study.

Sampling and method of recruitment

We conducted a convenience sample. We were present in the Internal Medicine departments of the various structures included in this study during the consultations.

Sample size

The sample size used for this study was 100 diabetic patients.

Selection of respondents

Inclusion criteria

Any adult type 2 diabetic patient who has given their consent to participate in the study.

Exclusion criteria

Non-consenting type 2 diabetic patients; type 2 diabetic patients with speech impediment.

Variables of interest

The variables of interest retained for this study were as follows: socio-demographic data, clinical data, eating habits, knowledge of physical activity of our respondents, attitude to physical activity of respondents, practice the physical activity of the respondents, the clinic and the treatments.

Data collection technique

It was made from the information collected on the survey sheets established beforehand.

Settings

At the end of the consultation, after having explained the nature of the study and having obtained the patient's consent, we succinctly proceeded to:

- An interview: for the collection of socio-demographic data, eating habits, history, date of discovery and type of diabetes, treatment methods and finally information relating to the practice and knowledge of physical activity.
- A physical examination: to collect clinical data (weight, height, BMI, blood pressure, waist circumference, hip circumference).

- For the calculation of the body mass index (BMI), according to the weight and the height according to the formula of Quetelet: BMI=Weight (kg) / (height in m)^2.

  BMI<18.5: thin subjects, BMI between 18.5 and 24.9 : normal weight, BMI between 25 and 29.9: overweight subject, BMI>30 obesity.

- For waist circumference: TT (IDF criteria). In humans, normal if ≤1cm. If >1cm, abdominal obesity.

- For the calculation of the waist/ hip ratio (WHR): (IDF criteria). In humans, normal value if RTH≤1, if >1 Android obesity. In women, normal value if RTH≥1, if RTH obesity >1 gynode.

Ethical aspects

At the start of each interview after good social practice, we were able to obtain verbal consent from all of our patients. Thus, it was explained to them that this study has a scientific purpose and that the data obtained will not be used for profit but aims to improve the prevention and management of diabetes.

Data processing and analysis

Data entry and analysis were done using SPSS software.

Word processing and preparation of tables and figures were performed on Excel software.

RESULTS

Sociodemographic data of study participants

Table 1 presents the socio-demographic characteristics of the study participants.

Table 1. Sociodemographic characteristics of study participants

Sociodemographic data	Frequency	Percentage (%)
Age range (years)		
≤34	4	4
35 – 50	53	53
51 – 66	36	36
>67	7	7
Total	100	100
Sex		
Male	51	51
Feminine	49	49
Total	100	100
Study level		
Primary	9	9

Secondary	45	45
University	44	44
Others*	2	2
Total	100	100
Marital status		
Bride)	75	75
Bachelor	6	6
Divorced	2	2
Widowed _ _	17	17
Total	100	100
Occupation		
Official	35	35
Household	23	23
Trader	19	19
peasants	10	10
Student/Pupil	3	3
Others**	10	10
Total	100	100

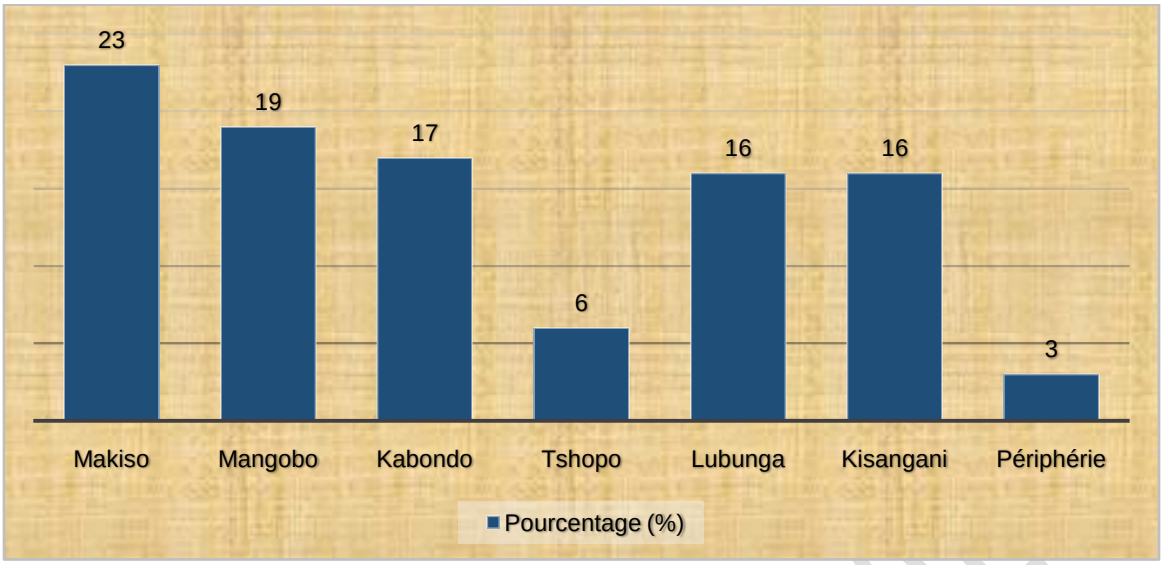
*Others: Illiterate, patent.

**Others: Motorbike taxi.

Table 1 reveals that the majority of our respondents were female with 51%, in the age group ranging from 35-50 years or 53%, with a majority secondary education level or 45%. The majority had a single marital status with 75% of cases and many of them were civil servants with 35%.

Figure 1 illustrates the municipalities of residence of respondents

Figure 1: Communes of residence of respondents



This figure shows that among our respondents, the majority resided in the municipality of Makiso, i.e. 23% of cases.

Clinical data

Vital parameters

Table2. Vital parameters of our respondents

Settings	Frequency	Percentage (%)
Weight(kg)		
≤ 50Kg	8	8
51 to 100	91	91
≥ 101	1	1
Total	100	100
Size(m)		
≤ 1.70	106	70.2
1.71 to 1.90	42	27.8
≥ 1.91	3	2.0
Total	151	100
BMI		
Normal	75	75
Overweight	5	5
Obesity	11	11

Lean	6	6
Total	100	100
Blood pressure(mmhg)		
≤ 90/60	3	3
90/60 to 120/90	57	57
≥ 120/90	40	40
Total	100	100
Waist(cm)		
≤ 50	0	0
51 – 100	91	91
≥ 101	9	9
Total	100	100
Hip circumference(cm)		
≤ 50	1	1
51 – 100	93	93
≥101	6	6
Total	100	100
Waist to hip ratio		
≤1	47	47
>1	53	53
Total	100	100
Heart rate(beats/min)		
≤ 60	1	1
61 – 80	51	51
≥ 81	48	48
Total	100	100

Table 2 illustrates that the majority of our respondents had a height ≤1.70m or 70.2%, 91% had a weight between 51-100kg, 75% a normal BMI, 57% with a blood pressure of 90/60mmhg at 120/90mmhg, the majority of our respondents (91%) had a waist circumference between 51-100cm and 51-100cm of hip circumference, i.e. 93%, the

majority of whom had a waist circumference to hip circumference ratio of >1, i.e. 53% of cases and with a heart rate ranging from 61 to 80 beats / min or 51%.

Food habit

Table 3 illustrates the eating habits of our respondents

Table 3 . Eating habits of our respondents

	Frequency	**Percentage (%)**
Alcohol		
Yes	33	33
No	67	67
Total	100	100
Amount of alcohol		
1 glass/day	12	36.4
2 - 5 glasses/day	16	44.5
> 6 glasses/day	4	12.1
Total	33	100
Tobacco		
Yes	14	14
No	86	86
Total	100	100
Quantity		
≤ 50 pack/year	9	64.3
≥ 51pack/year	5	35.7

Total	14	100

Table 3 illustrates that 67% of our respondents did not take alcohol, of which most of those who did, the quantity was 2 to 5 drinks/day, i.e. 16%. 86% of our respondents did not consume tobacco, of which 9% of those who consumed took a quantity ≤50 packs/year.

Knowledge, attitude and practice about physical activity

Physical knowledge of our respondents

Table 4 illustrates the Knowledge about physical activity of our respondents

Table 4 . Knowledge about physical activity

Awareness	**Frequency**	**Percentage (%)**
Type of physical activity recommended for diabetics		
Endurance (walking, cycling, gardening)	75	75
Combat (karate, boxing)	0	0
Do not know	25	25
Total	100	100
Risk of intense physical activity		
Hypoglycemia	72	72
Hyperglycemia	1	1
Orthostatic hypotension	0	0
Do not know	27	27
Total	100	100
Minimum frequency of activity to have a gain		
1 time	3	3
2 times	2	2
≥ 3 times	95	95

Total	100	100
Does the type of shoe matter		
Yes	90	90
No	10	10
Total	100	100
Regular physical activity helps		
lose weight	18	18
Lower blood sugar	62	62
Regulate blood pressure	0	0
Do not know	20	20
Total	100	100
Consideration of physical activity		
Part of Treatment	61	61
An optional option	19	19
A hobby	13	13
Do not know	7	7
Total	100	100

Table 4 reveals that endurance was the sport indicated in the majority of our respondents, i.e. in 75% of cases, with a risk of hypoglycemia in 72%, the majority had a frequency ≥3 times i.e. 95%. The choice of the type of shoe was important for 90% of respondents. 62% of our respondents regular activity lowered blood sugar and 61% considered it part of treatment.

Attitude on physical activity surveyed

Table 5 Illustrates there Knowledge , **attitude** and practice of physical activity of our respondents

attitudes	**Frequency**	**Percentage (%)**
Practice of physical activity		
Yes	8	8
No	92	92
Total	100	100
Regularity of physical activity		
Yes	4	4

No	96	96
Total	100	100
Why don't you do it		
Not useful	1	1
lack of time	12	13
Lack of will	28	30.4
location problem	0	0
Economic problem	2	2.1
Laziness	38	41.3
Others*	11	11.9
Total	92	100
Beginning of physical activity in relation to the discovery of diabetes		
Before discovery	8	100
At the time of discovery	0	0
After discovery	0	0
Total	8	100
Type of physical activity		
Race	3	37.5
Speed Walk	5	62.5
Bike	0	0
Total	8	100
Group physical activity		
Yes	5	62.5
No	3	37.5
Total	8	100
Desire for supervision of physical activity		
Yes	22	22
No	78	78

Total	100	100

***Others** : Fatigue, no strength.

Table 5 reveals that 92% of respondents did not practice physical activity, 41.3% was due to laziness, with 96% of those who practiced it being irregular. 100% of those who practiced it did it before the discovery of diabetes mellitus, speed walking was the most applied, i.e. 62.5%, the majority was in a group, i.e. 62.5% and the majority would not want supervision (78 %).

Practice of physical activity of respondents

Table 6 Illustrates there Knowledge **,** attitude and practice of physical activity of our respondents

Convenient	**Frequency**	**Percentage (%)**
Activity duration		
≤1h	5	62.5
2 – 3 hours	3	37.5
≥ 4h	0	0
Total	8	100
Frequency per week		
1 time / week	5	62.5
≥ 2 times/week	3	37.5
Total	8	100
Type of shoe		
Ketch	8	100
Sandal	0	0
Others*	0	0
Total	8	100
Place		
Road	6	75
Others**	2	25
Total	8	100
Coaching during physical activity		

Yes	1	10
No	7	90
Total	8	100

***Other: Babouche, boot.**

****Other: Post office, stadium.**

Table 6 states that for those who did physical activity, the majority practiced it for 1 hour or less (62.5%), with the frequency of once a week (62.5%), the choice of ketch was recorded of all respondents, 75% were on the road, 90% were unsupervised.

CLINICAL

Background

Table 7. The background of our respondents

Background	**Frequency**	**Percentage (%)**
Arterial hypertension (HTA)		
Yes	47	47
No	53	53
Total	100	100
MV duration		
1 year	37	78.7
25 years	8	17
≥ 6 years old	2	4.3
Total	47	100
cardiovascular status		
Heart failure	0	0
Congenital heart disease	1	1
arteriopathy	39	39
Healthy	60	60
Total	100	100
Family history of diabetes		

Yes	58	58
No	42	42
Total	100	100

Table 7 shows that 53% of our respondents were not hypertensive, the majority of those who developed hypertension developed it 1 year ago in 78.7% of cases, the majority of respondents were healthy in 60% of cases and 58% inherited it from parents.

Treatments

Table 8. The treatments of our respondents

Treatments	**Frequency**	**Percentage (%)**
Low carbohydrate-low calorie diet		
Yes	81	81
No	19	19
Total	100	100
Therapeutic education		
Yes	95	95
No	5	5
Total	100	100
insulin therapy		
No	35	35
Fast	21	21
Delay	25	25
Mixed	19	19
Total	100	100
teen		
No	18	18

Sulfonamide	16	16
Biguanide	9	9
Sulfonamide+biguanide	56	56
Biguanide+insulin delay	0	0
Alpha-glucosidase inhibitor	0	0
Sulfonamide+biguanide+insulin delay	1	1
Total	100	100

Table 8 shows that 81% of our respondents were on diet hypoglycidic - hypocaloric, the majority of patients followed therapeutic education, i.e. 95%, 35% of respondents were not on insulin therapy, most were on sulphonamide+biguanide, i.e. 56%.

DISCUSSION

Our study was carried out in medical centers and focused on the knowledge, attitudes and practices of type 2 diabetics on physical activity.

Sociodemographic data

Age

During our study, we recorded 53% of patients in the age group of 35-50 years, with an average age of 42.5 years. This could be explained by the fact that it typically affects senior adults after the age of 40. This differs from the result of Sadio 47% of age group of 26-35 years [2]. This is due to the established data collection method.

Sex

In our study, the male sex was the most frequent with 51%. This is in agreement with the result of Kamdem who had found a predominance of the male sex at 53.3[5].

Study level

We found that 45% of patients had secondary education. This disagrees with Sadio's finding 51.9% were uneducated [2]. This may be due to the location of the study and also to the recruitment bias of the evaluator for a better understanding of the questionnaire by the respondents.

Marital status

The majority of surveys were married, 75%. This can be attributed to the age group of 35-50 (53%) and 51-66 (36%). This agrees with Kamdem 82.2% [5]

Socio-professional activity

Civil servants were in the majority with 35% of activities, consistent with the sedentary nature of this professional category which is the bed of diabetes. Disagreeing with Sadio 32% was traders [2] but agreeing with Kamdem 's result 40% [5].

CLINICAL

age of diabetes

In our study, most diabetes 78.7% was discovered 1 year ago or less. This differs from Kamdem 64.4% of or less 4 years [5] and from K. Ayedi 81% hence less than 11 years [14]. This can be explained by the modification of food lifestyle and by the nature of the disease in our respondents.

Body mass index

In our study, the majority had a normal BMI in 75% of cases. This does not relate to Ayedi 's results K.[8] and Paul M.[9] which are respectively 71.3% and 65% higher than normal. This can be explained by the obese character.

Antecedent

The concept of familial diabetes alone was found the most with 58% of respondents. This is in agreement with Kamdem who had found 52.2% [5].

Food habit

Alcoholism was in first position with 33% of cases followed by smoking with 14% of cases. This is in agreement with the result (4.4%) of Kamdem [5].

Treatment

The majority of surveys, ie 95%, declared having followed therapeutic education. This agrees with the result of Braillard O. 91.3% [10].

Physical activity

Among our respondents, 8% did a physical activity, 96% of them practiced it irregularly. Which is different from that of Kamdem 73.3% [5]. This is due to age.

The majority of active patients had a weight ranging from 51-100kg. This can be explained by the fact that the BMI range of 18.5-24.9 kg/m² was more represented in our sample with 75%. Which is not very different from that of Kamdem 50% [5]. This is due to the sample size.

Walking is the most practiced activity with 62.5% of physical activities. Kamdem and Ayedi K. found 71.2% [5] and 100% [8] respectively. Because it is an easy sport to practice.

The most recurrent obstacle was laziness at 41.3%, given that the majority of respondents, as well as lack of willpower with 30.4% of patients, i.e. 61% admitted that physical activity makes part of the treatment of diabetes and only 19% consider it optional in the management of diabetes. This is related to Kamdem 39.5% laziness, 78.9% treatment part and 13.3% activity was optional [5] and Ayedi K. 30.5% lack of willpower [8].

Regarding the type of activity in type 2 diabetics, endurance activities (walking) are cited in 62.5% of cases. This is in agreement with the result of Kamdem 71.2% [5], Ayedi K. 100% [8] and Paul M. 65% [9].

As for the main risk of intensive physical activity, 27% of respondents said they did not know, hypoglycaemia was however mentioned in 72%. This agrees with Paul M. 65% [9] but disagrees with Sadio's result 62.7% of respondents who did not know. This is explained by the level of information on diabetes.

The frequency of ≥3 to have a gain in the management of type 2 diabetes was found the most with 95% of the responses. This is different from Kamdem T. [5] and Ayedi K. [8] who reported a frequency of 7 out of 7 days.

The main gain from physical activity mentioned was the reduction in blood sugar, cited alone in 62% by the respondents.

Regarding shoes and/or socks, 90% of patients said they were important, without however always knowing what to wear. The risk of injury and/or pain being the main reason for this importance.

A large majority of our respondents, ie 78%, did not admit the possibility of improving their practice of physical activity through material and/or professional supervision. This can be explained by the various obstacles encountered.

Study limit

At the end of our study, we can mention the following limitations:

- Selection bias: the patients questioned come from consultations with doctors in the city of Kisangani.
- Classification bias: the nature of the questionnaire with closed propositions does not always find an equivalence with the patient's response and does not allow the latter to express themselves freely.

Conclusion

Diabetes mellitus, a real public health problem, is a chronic disease so multidisciplinary management is based on three main measures: diet, physical activity and medication. In this term, our study focused on physical activity in type 2 diabetics, knowledge, attitudes and practices. Our study showed that the majority of diabetics do not practice physical activity. Thus, its importance during therapeutic education remains essential in order to improve the integral care of the diabetic patient.

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SURVEY SHEET

ID number :/ ../ Date : . / /202

1. Sociodemographic data

- Gender: M/ / F/ /
- Age: ....years
- Socio-professional activity: 1. civil servant, 2. housewife, 3. tradesman, 4. peasants, 5. pensioner,

6. student/pupil, 7. Other:

- Education level: 1. primary, 2. secondary, 3. university , 5. Other
- Residence (address): 1. C/Makiso 2. C/Kisangani 3. C/Kabondo 4. C/Mangobo 5. C/Tshopo 6. C/Lubunga 7. Other (to be specified)

- Marital status: 1. Married 2. Single 3. Divorced 4. Widowed

2. Clinical and biological data

- Date of discovery of diabetes
- Size :
- RT(rest)
- Weight :
- HR(rest)
- BMI:
- Waist size
- Hip circumference
- Waist/hip ratio

3. Food Habit

Alcohol: 1. yes 2. no; if yes, quantity..... (cl)/day or glass/day

Tobacco: 1. yes 2. no; if yes..... pack/year

4.ATCD

Personal:

- Date of discovery of diabetes:
- HTA: 1. yes 2. no 3. if yes date of discovery..... 4. Tracking mode
- Cardiovascular status: 1. Heart failure 2. Congenital heart disease 3. Arteriopathy 4. Healthy 5. Other

Family

- Familial concept of diabetes: 1. yes 2. no

5. Processing

- Low carbohydrate-low calorie diet: 1. yes 2. no
- Therapeutic education: 1. yes 2. no
- Insulin: 1. no 2. rapid 3. delayed 4. mixed

- ADO: 1. no 2. sulphonamide 3. Biguanide 4. Sulfonamide+biguanide 5. Biguanide+ depot insulin 6. alpha-glucosidase inhibitor 7. Biguanide+sulphonamide+ depot insulin.

6. Physical activity: knowledge, attitudes, practices

- Physical activity: 1. yes 2. no
- Do you do it regularly: 1. yes 2. no
- Why don't you :

1. not useful 2. lack of time 3. lack of will 4. location problem 5. economic problem 6. laziness 7. others

- When did you start physical activity in relation to the discovery of your diabetes: 1. before the discovery 2. at the time of the discovery 3. after the discovery
- Type of physical activity: 1. running 2. brisk walking 3. cycling 4. Other to be specified
- During physical activity are you: 1. In a group 2. Alone
- Duration of activity:
- Frequency per week:
- Place:
- Are you supervised in your physical activity: 1. yes 2. no
- What type of footwear do you wear during physical activity :

- Do you do blood sugar checks : 1. before 2. during 3. after exercise 4. never around exercise
- What type of physical activity is recommended for diabetics: 1. endurance (walking, cycling, gardening...) 2. combat (boxing, karate...) 3. other

- What is the main risk of intense physical activity : 1. hypoglycemia 2. hyperglycemia 3. orthostatic hypotension 4. others
- What is the minimum frequency per week of physical activity to have a gain 1. 1times 2. 2times 3. 3times 4. 4times 5. 5times 6. others
- The type of shoe or sock worn during physical activity is important: 1. yes 2. no
- Regular physical activity allows you to: 1. Lose weight

2. lower your blood sugar 3. regulate your blood pressure 4. other

- How do you consider physical activity : 1. part of treatment 2. leisure 3. optional 4. Other
- Would you like material and/or professional support to improve your practice of physical activity: 1. yes 2. no