

CHARACTERIZATION OF DIABETES MELLITUS IN THE DOMINICAN REPUBLIC

Ammar Ibrahim

0000-0002-6001-2631

Angiolina Camilo

0000-0003-4874-3025

Carlos Ruiz Matuk

0000-0003-2681-4953

Jenny Cepeda

0000-0002-5758-863X

Yousef S. Ebrahim Ibrahim

0009-0007-4430-7863

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



PROBLEM STATEMENT

- Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin or when the body does not effectively use the insulin it produces. The effect of uncontrolled diabetes is hyperglycemia³.
- Type 2 diabetes mellitus (T2DM) has become one of the **most serious health problems of our time**⁴, being one of the chronic non-communicable diseases with the highest morbidity and **mortality**, one of the greatest emergency of the 21st century¹.
- Due to the burden that this condition implies in the Dominican population, it is necessary to identify the characteristics of the population **with the highest** risk of suffering from this disease and those who are already diagnosed to determine the criteria that have the greatest impact on **metabolic control**, this being the main focus for the reduction of feared complications.

CONTEXTUALIZATION

GLOBAL PICTURE

According to the report of the International Diabetes Federation in 2017, the global

prevalence of diabetes mellitus is 424.9 million people, with an estimate for 2045 of 628.6 million people, corresponding to 8.8% of the world population. and 9.9% by 2045.

The global estimate of impaired glucose tolerance is 352 million people aged 20-79 years corresponding to 7.3% and an estimate for 2045 of 532 million people corresponding to 8.3%

REGIONAL OVERVIEW

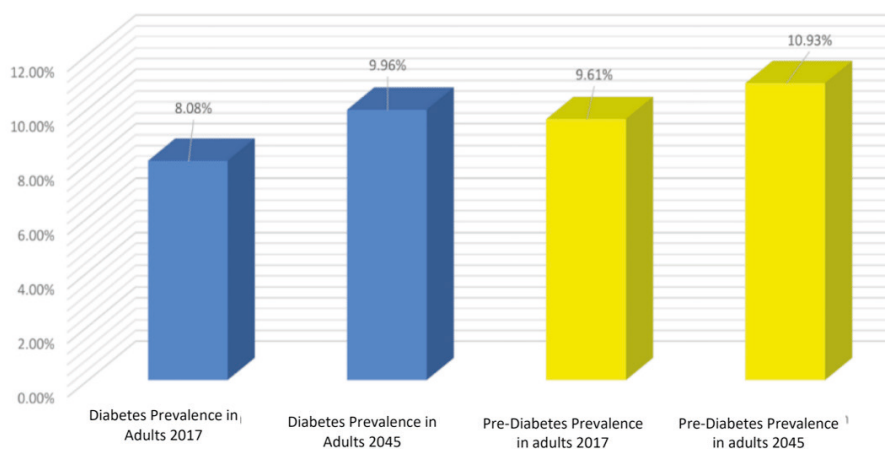
- The prevalence of diabetes in our area has increased in recent decades, the current number of this condition is 26 million people in the population of the entire South and Central American region, according to data presented at the IDF in 2017.
- The estimated projection of diabetes in our region for the year 2045 is 42.3 million people with diabetes, corresponding to a comparative prevalence of 7.6% of diabetes mellitus and 9.6% for 2045.

DOMINICAN REPUBLIC PANORAMA ACCORDING TO IDF

Prevalence of Diabetes and IOG in adults (20-79 years), 2017 and 2045



DOMINICAN REPUBLIC PANORAMA ACCORDING TO IDF



CHARACTERISTICS OF THE STUDY POPULATION

	Age	Weight Kg	CMS size	Waist CMS	Systolic	Diastolic	Blood glucose Fast	blood glucose pp
Half	41.98	76.49	166.11	87.71	123.87	78.58	101.50	116.37
Standard deviation	16,339	25,338	28,988	20,974	25,871	20,324	46,751	58,607

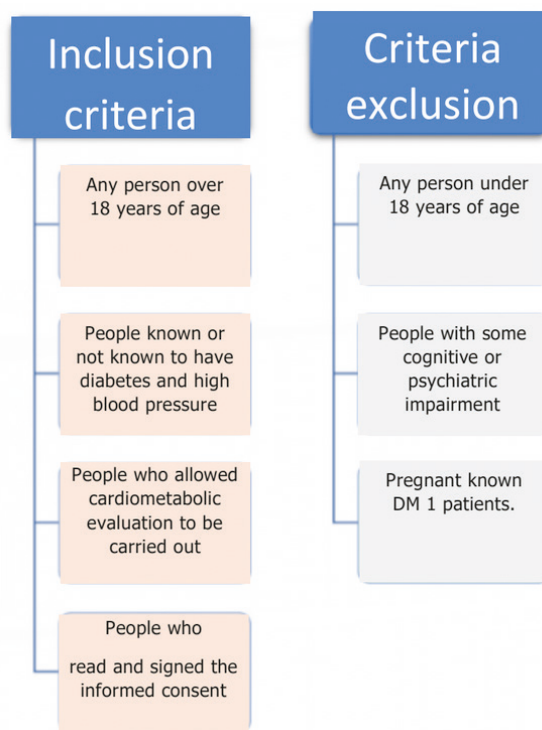
PURPOSE OF THE STUDY

- Determine the clinical, anthropometric and sociodemographic characteristics and document the frequency of diabetes in the adult population in the Dominican Republic.
- Determine the clinical characteristics and number of people with Prediabetes.
- Quantify the risk factors that induce or increase the risk of diabetes and its complications (obesity, HBP...)

METHODOLOGICAL DESIGN

- Cross-sectional study that included a non-probabilistic sample of 10,598 people over 18 years of age recruited in homes, educational centers, shopping centers, health centers, churches, among others, in all provinces of the country.
- A questionnaire was applied that collected clinical data, capillary blood glucose samples were taken and blood pressure was determined for each participant.

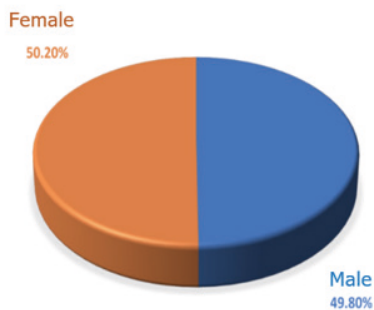
SAMPLE CHARACTERISTICS



SOCIODEMOGRAPHIC DATA

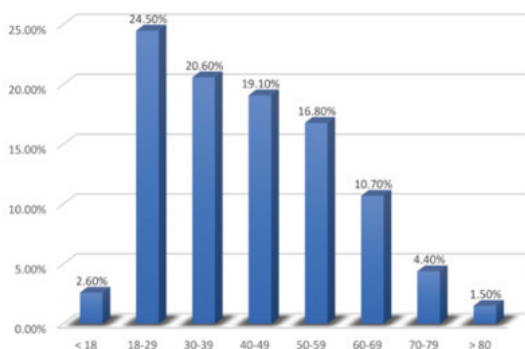
SEX IN GENERAL SAMPLE

	Frequency	Percent
Male	5250	49.8 %
Female	5299	50.2 %
Total	10549	100.0 %

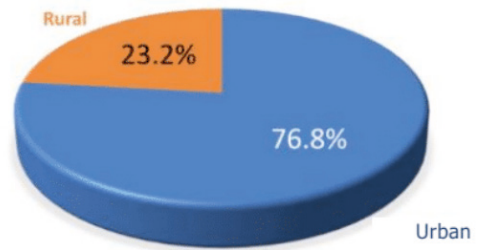


AGE RANGE IN GENERAL SAMPLE

Age in years	Quantity	Percentage
Under 18	273	2.6
18-29	2553	24.5
30-39	2150	20.6
40-49	1996	19.1
50-59	1748	16.8
60-69	1116	10.7
70-79	460	4.4
Over 80	161	1.5
Total	10431	100.



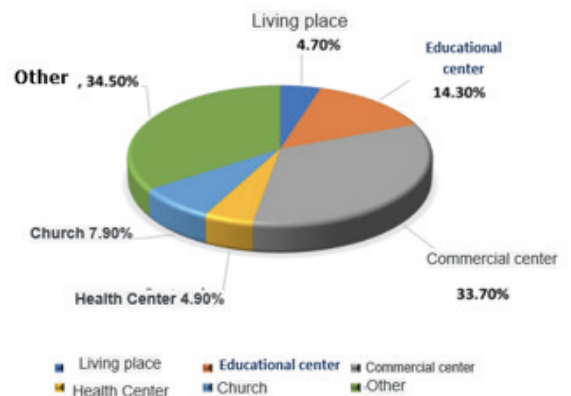
EVALUATED AREAS



	Frequency	Percent
Urban	8002	76.8
Countryside	2419	23.2
Total	10421	100.0

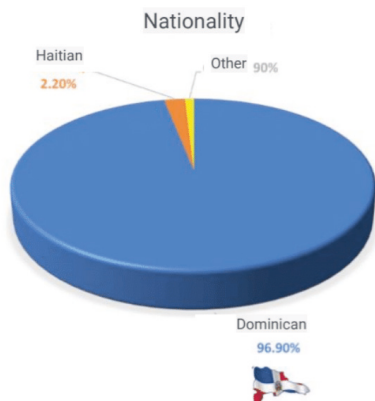
PLACE OF APPLICATION OF THE SURVEYS

	Frequency	Percent
Living place	490	4.7
Educational center	1501	14.3
Commercial center	3552	33.7
Health Center	512	4.9
Church	834	7.9
Other	3631	34.5
Total	10520	100



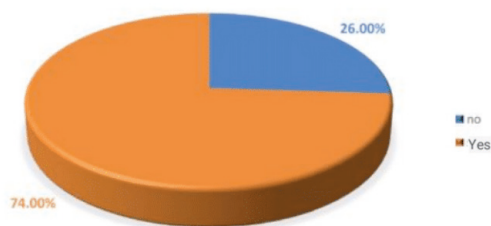
NATIONALITY

	Frequency	Percent
Dominican	10106	96.9
Haitian	231	2.2
Other	98	0.9
Total	10435	100.0



DIRECT FAMILY MEMBER WITH DIABETES IN PEOPLE WITH KNOWN DIABETES

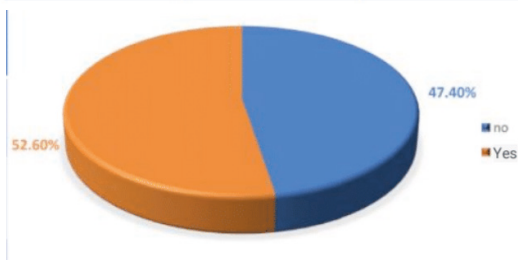
	Frequency	Percent
No	306	26
Yes	870	74
Total	1176	100.0



DIRECT RELATIVE WITH DIABETES

DIRECT FAMILY MEMBER WITH DIABETES IN GENERAL SAMPLE

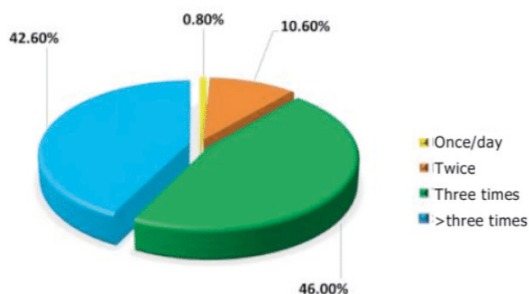
	Frequency	Percent
No	5022	47.4
Yes	5577	52.6
Total	10577	100.0



MEAL FREQUENCY

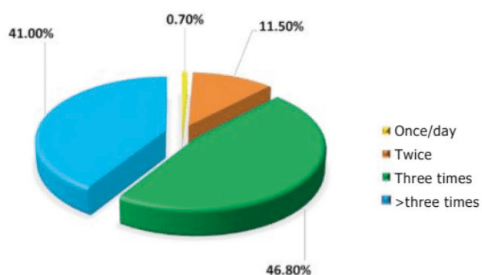
FOOD FREQUENCY IN GENERAL SAMPLE

	Frequency	Percent
Once a day	86	0.8
Twice	1119	10.6
Three times	4863	46.0
More than three times	4506	42.6
Total	10577	100



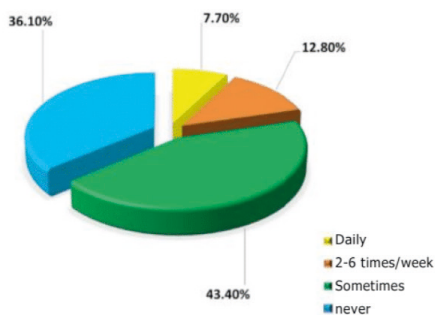
FOOD FREQUENCY IN PEOPLE WITH KNOWN DIABETES

	Frequency	Percent
Once a day	6	0.7
Twice	137	11.5
Three times	552	46.8
More than three times	483	41
Total	1178	100



FREQUENCY OF SOFT DRINK IN PEOPLE WITH KNOWN DIABETES

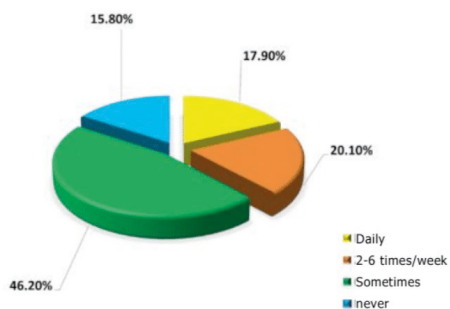
	Frequency	Percent
Daily	91	7.7
2-6 times/week	151	12.8
Sometimes	511	43.4
Never	425	36.1
Total	1178	100



CONSUMPTION OF SOFT DRINKS

FREQUENCY OF SOFT DRINK IN GENERAL SAMPLE

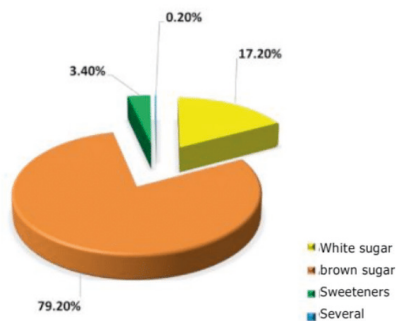
	Frequency	Percent
Daily	1891	17.9
2-6 times/week	2131	20.1
Sometimes	4886	46.2
Never	1669	15.8
Total	10577	100



CONSUMPTION OF SWEETENERS

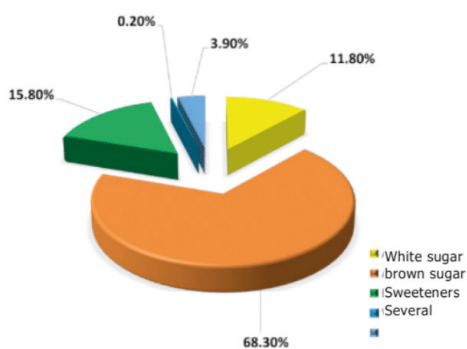
TYPES OF SWEETENERS USED IN GENERAL SAMPLE

	Frequency	Percent
White sugar	1804	17.2
Brown sugar	8301	79.2
Sweeteners	353	3.4
Several	24	0.2
Total	10482	100.0



TYPES OF SWEETENERS USED IN PEOPLE WITH KNOWN DIABETES

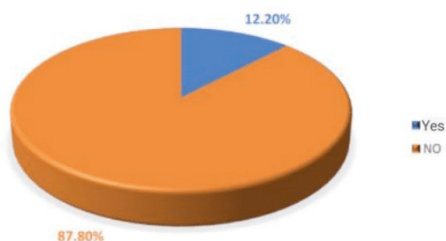
	Frecuencia	Porcentaje
White sugar	139	11.8
Brown sugar	805	68.3
Sweeteners	185	15.8
Several	3	0.2
The person did not respond	46	3.9
Total	1178	100.0



SMOKING HABITS

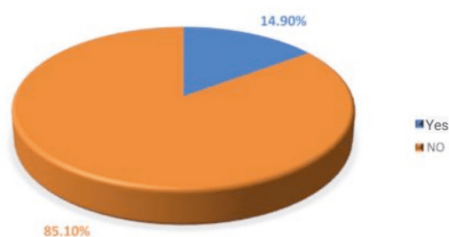
SMOKING HABIT IN GENERAL SAMPLE

	Frequency	Percent
Smoke	1287	12.2
Does not smoke	9292	87.8
Total	10581	100.0



SMOKING HABIT IN PEOPLE WITH KNOWN DIABETES

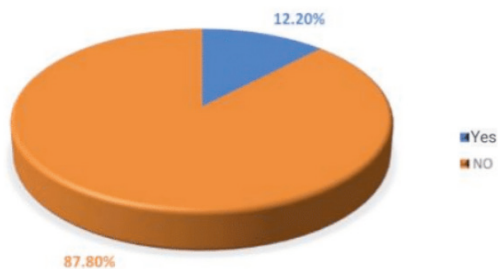
	Frequency	Percent
Smoke	176	14.9
Does not smoke	1002	85.1
Total	1178	100.0



ALCOHOL CONSUMPTION

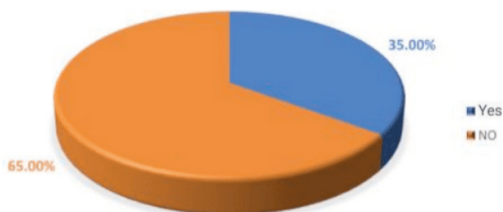
ALCOHOL CONSUMPTION IN GENERAL SAMPLE

	Frequency	Percent
Yes	1287	12.2
No	9293	87.8
Total	10581	100.0



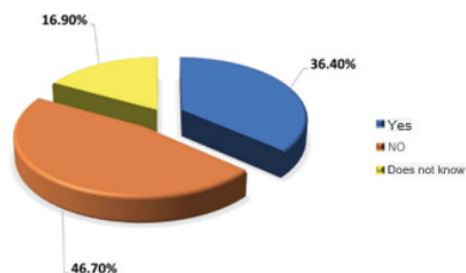
ALCOHOL CONSUMPTION IN PEOPLE WITH KNOWN DIABETES

	Frequency	Percent
Yes	412	35
No	766	65
Total	1178	100.0



KNOWN HISTORY OF HYPERLIPIDEMIA IN PEOPLE WITH KNOWN DIABETES

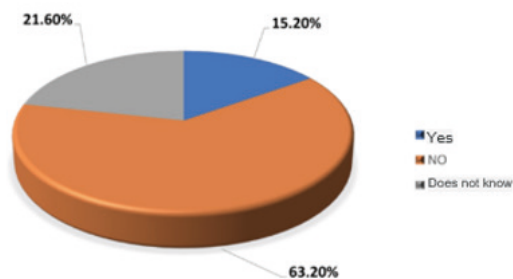
	Frequency	Percent
Yes	429	36.4
No	550	46.7
Does not know	199	16.9
Total	1178	100.0



KNOWN HISTORY OF HYPERLIPIDEMIA

KNOWN HISTORY OF HYPERLIPIDEMIA IN GENERAL SAMPLE

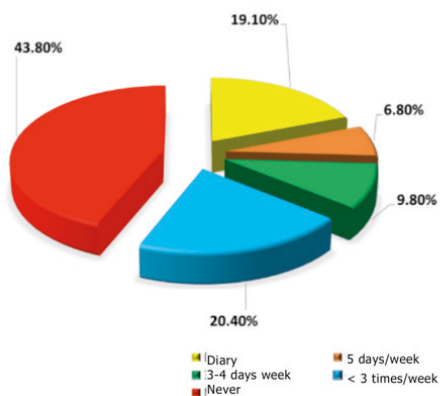
	Frequency	Percent
Yes	1605	15.2
No	6659	63.2
Does not know	2274	21.6
Total	10538	100.0



FREQUENCY OF EXERCISES

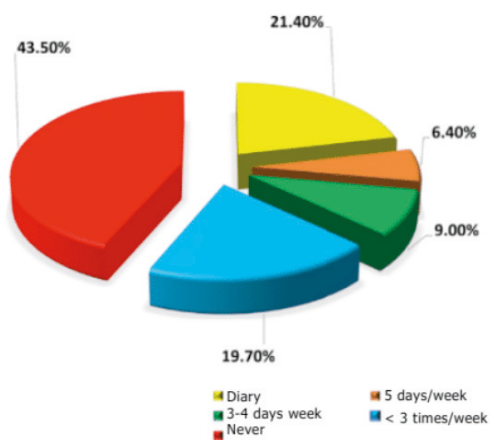
FREQUENCY OF EXERCISES IN GENERAL SAMPLE

	Frequency	Percent
Diary	1993	19.1
5 days/week	712	6.8
3-4 days week	1023	9.8
< 3 times/week	2128	20.4
Never	4562	43.8
Total	10419	100.0



FREQUENCY OF EXERCISES IN PEOPLE WITH KNOWN DIABETES

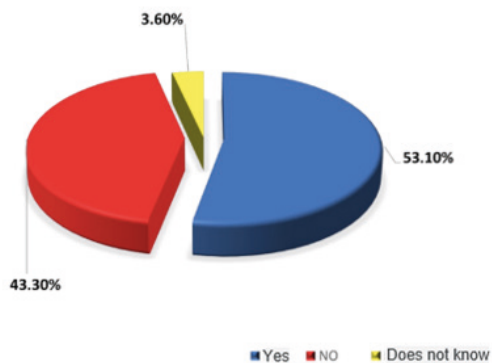
	Frequency	Percent
Diary	246	21.4
5 days/week	74	6.4
3-4 days week	103	9
< 3 times/week	227	19.7
Never	500	43.5
Total	1150	100.0



HISTORY OF MEASUREMENT OF GLUCEMIA IN GENERAL SAMPLE

HISTORY OF BLOOD GLUCOSE MEASUREMENT IN GENERAL SAMPLE

	Frequency	Percent
Yes	5593	53.1
No	4563	43.3
Does not remember	380	3.6
Total	10542	100.0



DIAGNOSTIC CRITERIA FOR TYPE 2 DIABETES AND PREDIABETES

- Those diagnosed by your doctor (known diabetes).
- Those who had fasting capillary blood glucose ≥ 126 mg/dL in the absence of a previous diagnosis of diabetes.
- Random postprandial blood glucose levels ≥ 200 mg/dL in the absence of a previous diagnosis of diabetes.

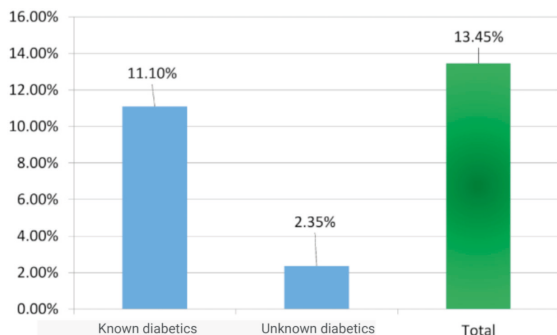
Those who had blood glucose levels between 100-125 mg/dL fasting or between 140-199 mg/dL 2 hours postprandial were classified as prediabetes.

SHOWS 10,598 PEOPLE

- **People with DM who were unaware of their diagnosis:**
 - Glic > 126 mg/dl on an empty stomach 61 percent (0.65%)
 - Glic PP > 200 mg/dl: A total of 160 people (1.70%)
- Patients with diabetes, and knew their diagnosis: 1178 people (11.1%)
- Patients with diabetes and who do not know their diagnosis: 221 people (2.35%).

PEOPLE WITH DIABETES IN THE SAMPLE

Total:
 $11.1 + 2.35 =$
13.45 %



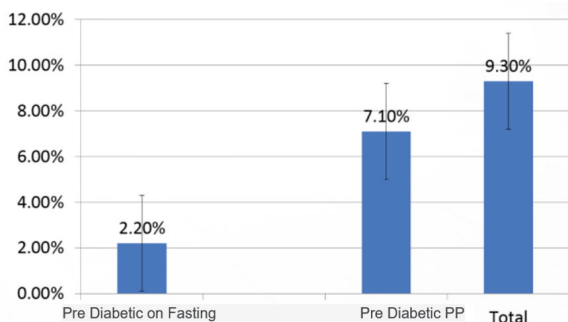
DIAGNOSTIC CRITERIA FOR PREDIABETES

muestra
9,418

- People with altered fasting blood glucose (100-125 mg/dl): 208 people (2.2%)
- People with postprandial glycemia (140-199 mg/dL): 667 people (7.1%)

Total 875 people: 9.3%

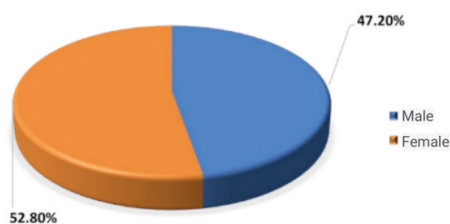
PREDIABETES



SEX IN PEOPLE WITH KNOWN DM

SEX IN PEOPLE WITH KNOWN DM

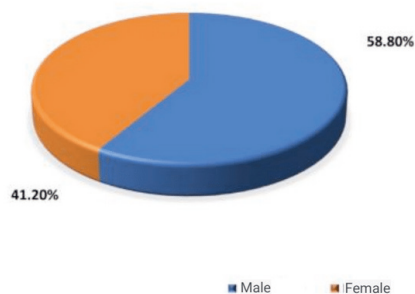
	Frequency	Percent
Male	556	47.2
Female	622	52.8
Total	1178	100.0



SEX OF PEOPLE WHO DID NOT KNOW THEY HAD DIABETES

SEX OF PEOPLE WHO DID NOT KNOW THEY WERE DIABETIC (221 PEOPLE)

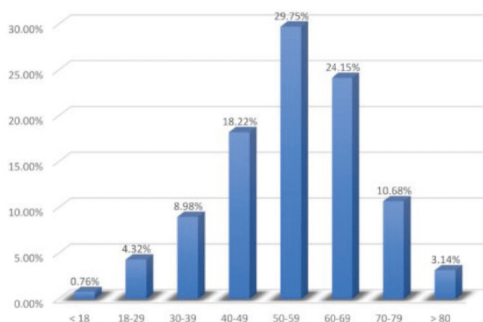
Sex	Frequency	Percent
Male	130	58.8
Female	91	41.2
Total	221	100.0



AGE RANGE IN PEOPLE WITH KNOWN DIABETES

AGE RANGE IN KNOWN DIABETICS

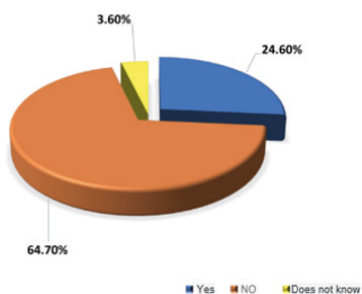
Age in years	Quantity	Percentage
Under 18	9	0.76
18-29	51	4.32
30-39	106	8.98
40-49	214	18.22
50-59	351	29.75
60-69	284	24.15
70-79	126	10.68
Over 80	37	3.14
Total	1178	100.



HISTORY OF HTA

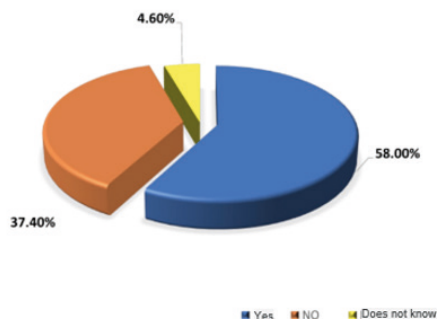
HTN HISTORY IN GENERAL SAMPLE

	Frequency	Percent
Yes	2611	24.6
NO	6854	64.7
Does not know	1135	10.7
TOTAL	10600	100 %



PEOPLE WITH DM AND HISTORY OF HIGH BLOOD PRESSURE

	Frequency	Percent
Yes	684	58.0
NO	440	37.4
Does not know	54	4.6
TOTAL	1178	100 %



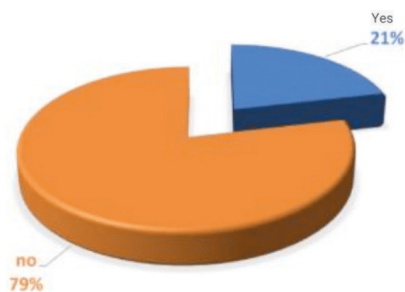
ISOLATED SYSTOLIC ARTERIAL HYPERTENSION IN GENERAL SAMPLE

10,598

SBP≥140 mmHg:2268 people, for 21.40%

ISOLATED SYSTOLIC ARTERIAL HYPERTENSION IN GENERAL SAMPLE (10598)

TAS≥140 MMHG: 2268 PEOPLE, FOR 21.40%



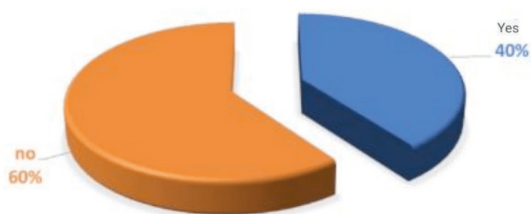
ISOLATED SYSTOLIC ARTERIAL HYPERTENSION IN PEOPLE WITH KNOWN DIABETES

1,178

SBP \geq 140 mmHg:469 people, for 39.81%

ISOLATED SYSTOLIC ARTERIAL HYPERTENSION IN PEOPLE WITH KNOWN DIABETES (1178)

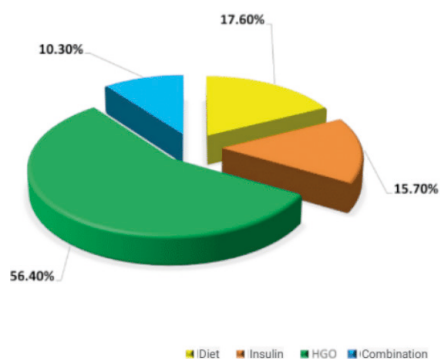
SBP \geq 140 mmHg:469 people, for 39.81%



TREATMENT AND METABOLIC CONTROL IN PEOPLE WITH DIABETES

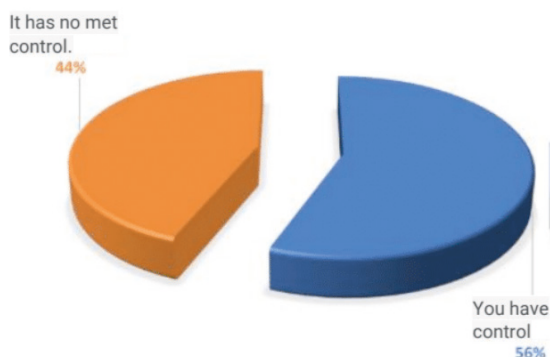
DIABETES TREATMENT IN PEOPLE WITH KNOWN DIABETES

	Frequency	Percent
Diet	190	17.6
Insulin	170	15.7
ADO	608	56.4
Combination	111	10.3
Total	1078	100.0



PEOPLE WITH DIABETES AND METABOLIC UNCONTROL

	Frequency	Percent
Fasting blood glucose \geq 130 mg/dl	94	8
Postprandial Glycemia \geq 180 mg/dl	427	36
Total	521	44 %



VISCERAL OBESITY GENERAL SAMPLE

ACCORDING TO ABDOMINAL CIRCUMFERENCE

10,549

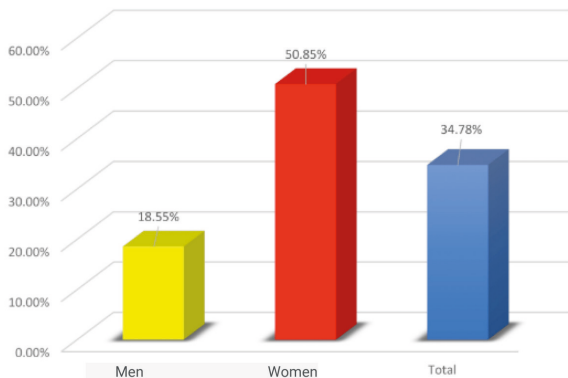
general sample

- Men with AC \geq 103 cm: 974 people 10,549 (out of a total of 5250), for 18.55% of men.
- Women with AC \geq 88cm: 2695 people (out of a total of 5299), for 50.85% of women.

In general sample: 3669 out of a total of 10549, for 34.78%

VISCERAL OBESITY (ACCORDING TO ABDOMINAL CIRCUMFERENCE), GENERAL SAMPLE 10549

- Men with AC \geq 103 cm: 974 people (out of a total of 5250), for 18.55% of men.
- Women with AC \geq 88cm: 2695 people (out of a total of 5299), for 50.85% of women.
- In the general population: 3669 out of a total of 10549, for 34.78%



VISCERAL OBESITY PEOPLE WITH KNOWN DM ACCORDING TO ABDOMINAL CIRCUMFERENCE

1,178

IN KNOWN DIABETICS

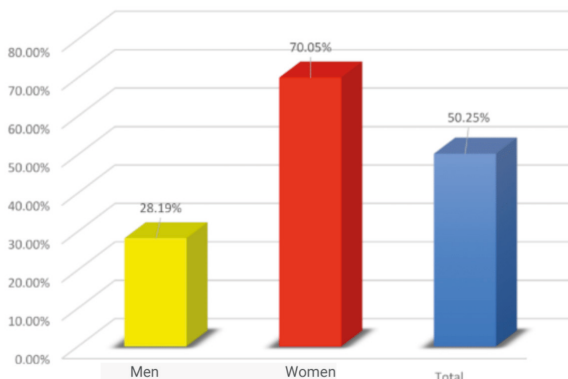
- Men with AC \geq 103 cm: 157 people (out of a total of 557), for 28.19% of men.
- Women with AC \geq 88cm: 435 people (out of a total of 621), for 70.05% of women.

In Diabetics in general: 592 people out of a total of 1178, for 50.25%

VISCERAL OBESITY (ACCORDING TO ABDOMINAL CIRCUMFERENCE), IN KNOWN DIABETICS (1178)

- Men with AC \geq 103 cm: 157 people (out of a total of 557), for 28.19% of men.
- Women with AC \geq 88cm: 435 people (out of a total of 621), for 70.05% of women.

In Diabetics in general: 592 people out of a total of 1178, for 50.25%



REFERENCES

1. Diabetes Atlas de la FID – 8ª edición, 2017
2. Organización Mundial de la Salud — Perfiles de los países para la diabetes, 2016.
3. Clasificación y diagnóstico de la DM. Diabetes Care. Dic 2017. Vol 41 (1):16
4. A.W. Campbell. The diabetes pandemic. Altern Ther Health Med, 17 (2011), pp. 8-9
5. Wahrenberg H, Hertel K, Leijonhufvud BM, et al. Use of waist circumference to predict insulin resistance: retrospective study. BMJ. 2005; 330:1363-4.
6. Pallarés V, Piñón F, Diago JL, en nombre de los investigadores del estudio Burriana. Diabetes mellitus y otros factores de riesgo cardiovascular mayores en una población del Mediterráneo español. Estudio Burriana. Endocrinol Nutr. 2006; 53:158-67.

7.Chobanian AV, Bakris GL, Black HR, et al. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA. 2003; 289:2560-72.

8.Expert Panel on Detection, Evaluation, Treatment oh High Blood Cholesterol in Adults. Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation and Treatment oh High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA. 2001; 285:2486-97

9.Encuesta demográfica de salud. Maritza M. Achécar, Nelson Ramírez M. Juan J. Polanco, Gisela Quiterio, José M. Guzmán, Adrienne Cox, Juan Schoemaker. Rep. Dominicana. 2014.

THANKS

The researchers thank:

- The UNIBE medical students who participated in the data collection sessions.
- INDEN Diabetes and Nutrition residents.
- UNIBE Research Dean and its Dean Dr. Aida Mencía.
- INDEN authorities headed by the Medical Director, Dr. Aura Mota.
- Dr. Pablo Salcedo, Dr. Magdeline Carrasco.

COMPARISON BETWEEN INDEN-UNIBE AND IDF

