

## Lifestyle in adults with type II diabetes mellitus who attend the Pumapungo health center. Cuenca-Ecuador

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### *Abstract*

Background: Type II diabetes mellitus is one of the preventable diseases with a high incidence today. In addition, it is one of the most frequent problems in the country, in which having a healthy lifestyle such as a good diet, physical activity and exercise, knowledge of the disease, a positive emotional state and adherence to treatment is essential to maintain this healthy lifestyle. To control the disease and not show complications that put health at risk; as well as the well-being of the individual.

Objective: The objective that was raised in the thesis was to determine the lifestyle in adults with type II diabetes mellitus who attend the Pumapungo Health Center in the city of Cuenca, period 2022 - 2023.

Methodology: A cross-sectional descriptive quantitative study was carried out. The sample consisted of 241 adults between 25 and 64 years of age with type II diabetes mellitus from the Pumapungo Health Center. For the collection of sociodemographic data, a document was used and to determine lifestyles, the IMEVID test was applied. For the analysis and tabulation of the results, the following programs were used: Excel 2019 and the statistical

software IBM SPSS Statistics version 25.0; using descriptive statistics with tables and multivariable association statistics based on chi-square and p-value.

Results: When analyzing the results found, it was shown that adults who attend the Pumapungo Health Center in the city of Cuenca that have an inadequate lifestyle in 67.6% because they do not practice healthy habits. In conclusion, type II diabetes mellitus is a chronic disease in which, if healthy lifestyles are not maintained, systemic complications can developed.

Keywords: lifestyles, diabetes mellitus type II, adults, IMEVID.

## Introduction

At present, around the world, with globalization and changes in the way of life of people, it has triggered a high incidence of Type II Diabetes Mellitus, a preventable disease that is also known as Non-insulin-dependent Diabetes (1), where one of the biggest factors that influence this disease is lifestyle; since this includes habits and behaviors of daily living. Obviously, poor lifestyles bring with them multiple complications, premature deaths, problems for governments and health systems (2).

Lifestyles can be defined as the set of behaviors that people acquire and develop in their day to day; These can be healthy or unhealthy, are modifiable and are influenced by several factors; that affect our health (2).

According to the Pan American Health Organization (PAHO), diabetes mellitus is the sixth leading cause of death worldwide and the fourth in the Americas. In our country, its incidence has increased in alarming proportions, so this disease is part of the priority pathologies of the "Primary Health Care Program of Ecuador" (1). According to the World Health Organization (WHO) considers that, by 2030 this will be the seventh cause of mortality on the planet (7) evidencing that worldwide 1.5 million people die due to the disease, estimating that in the year 2045 an approximate of 700 million people will be affected and that it will be the seventh cause of mortality in 2030 (12).

The prevalence of the disease has been increasing in the last 40 years, because, of the 153 million diabetic people present in the world between 1980 and 2013, this number was exceeded with 382 million, based on this to estimate that, by 2035 this figure will grow even more reaching approximately a total of 552 million (3).

According to the National Institute of Statistics and Census (INEC), Ecuador is not exempt from this situation, since in 2017 type II diabetes mellitus was the second cause of death in the population after ischemic heart diseases. In the last 10 years, the number of deaths from diabetes has increased by 51%, with 4906 deaths, of which women are the highest group, with a total of 2628 deaths. Even these cases increased

with age, from 65 years onwards, because a total of 6,731 cases were presented from which hospital care was provided (9).

In Ecuador, there is evidence that mortality from type II diabetes mellitus has increased significantly in recent years, totaling 4,895 deaths in 2017, including 2,289 men and 2,606 women, and type II DM accounted for 90.3% of all deaths. Emphasizing that the mortality rate from diabetes mellitus among people aged 20 to 79 years in Ecuador was 29.18 % (13).

Reports from the World Health Organization (WHO) also indicate that, in Ecuador, diabetes rates have been increasing in recent years (10). Likewise, the National Health and Nutrition Survey (ENSANUT) showed data indicating that the prevalence of diabetes in the population between 10-59 years of age is 1.7%; emphasizing that this proportion increases progressively from the age of 30 and 50, estimating that one in 10 Ecuadorians already has diabetes (4) (5).

With the information given above, the research presented below focuses on an analysis of the lifestyles of people with type II diabetes mellitus. For this, we have helped ourselves with a validated test that encompasses the important aspects of healthy habits called Instrument to Measure Lifestyle in Diabetics (IMEVID), the study subjects are patients with this pathology who come to the Pumapungo health center in the city of Cuenca; since, multiple studies show that certain healthy changes in lifestyle are effective in reducing the burden of disease, Improve people's health and quality of life. Therefore, by determining the relationship between lifestyles and type II diabetes mellitus, a guide can be established, as well as new strategies to act in an integral way, both in the promotion and treatment of this problem from the first level of health.

According to an article published in the Cuban Journal of Rheumatology, its authors indicate that; considering the current figures of the total population of the world, of the 7200 million existing inhabitants, 381.8 million have the presence of diabetes, with a percentage between 85% and 95% corresponding to type II diabetics in each of the developed countries; These figures are believed to be exceeded in low- and middle-income countries. In addition, it is estimated that about 40% of individuals with this disease (about 145 million, of which 5.8 million are in Central and South America), do not know their condition or have not been diagnosed. About half of adults with type II diabetes mellitus are between the ages of 40 and 59. More than 80% of the 184 million people with diabetes in this age group live in low- and middle-income countries (8).

In a study conducted at the hospital of Callao in 2018, by a student at the University of San Martín de Porres in Peru, he was able to indicate that most patients who have type II diabetes mellitus have an unhealthy

lifestyle, that in the conditions they find themselves can present complications and even lead to death. Since the results showed that 3% of respondents have an adequate/healthy lifestyle, while the remaining 97% have an inadequate/harmful lifestyle (10).

In Ecuador, in the diabetic population of Esmeraldas, a study was carried out focused on lifestyles and the influence they have on the appearance of related health problems, where the results showed that the study subjects present complications in their disease because they maintain unfavorable lifestyles such as poor nutritional status, physical inactivity and the consumption of toxic substances putting their quality of life at risk (11). Faced with written reality, it is important to study and understand the lifestyles of patients suffering from type II diabetes mellitus; to avoid the fatal consequences in people who suffer from it.

## **Materials and methods**

### Study design and sample selection

A quantitative cross-sectional descriptive study was conducted which included 241 adult patients with type II diabetes mellitus between 25 and 64 years old who attended the Pumapungo health center. The participating patients were selected through an intentional non-probabilistic sampling who attended the Pumapungo Health Center. Each of the participants was explained what the study consisted of and the corresponding informed consent was obtained, before the application of the data collection instruments.

### Evaluation of subjects

The participating patients were applied the technique of direct interview with a questionnaire of questions on the sociodemographic variables previously prepared and the IMEVID test to patients who met the inclusion criteria and decided to participate voluntarily after signing the informed consent. For the sociodemographic variables age, sex, work, level of education and economic income, an expofeso questionnaire previously prepared by the authors, the same one that provided us with sociodemographic information of the study participants. To determine the lifestyle, the IMEVID test was used, an instrument which allows to measure the lifestyle in diabetic patients. It has a high reliability since, in a study carried out in Mexico, it was validated with a Cronbach's alpha of 0.81 (6). This questionnaire was carried out directly and has 25 items in which each answer has three options with a score of 4, 2 and 0 points respectively. It contains indicators that include nutrition, physical activity, tobacco use, alcohol consumption, information on diabetes, emotions and compliance with medical treatment (6).

### Statistical analysis

The processing and tabulation of data was carried out with the use of computer science, through the use of Excel 2019 programs and subsequent analysis with the statistical software IBM SPSS Statistics version 25.0. The interpretation of quantitative data was performed using descriptive statistics using frequency and percentage tables. The statistical analysis was carried out in a descriptive manner with the use of tables, in addition multivariate statistics were used using Pearson's chi-square, p-value of 0.05 and 95% confidence interval for statistical significance.

### Results

In Table 1. A total of 241 participants were surveyed, of which it was evidenced that the most frequent age group corresponds to middle adulthood (45-64 years) with 61.8% (n=194) with a higher male participation of 50.6% (n=122). Regarding the level of education, the secondary grade was the highest, with 36.1% (n=87). On the other hand, it is observed that 74.3% (n=179) do work. Finally, in terms of income, it was highlighted that 35.3% (n=85) have a salary lower than the basic one.

**Table 1. Description according to sociodemographic variables of adults with type II diabetes mellitus who attend the "Pumapungo" health center, Cuenca 2022-2023**

Variable		Frequency n=241	Percentage 100%
<b>Age</b>	Early adulthood	92	38,2%
	Middle adulthood	149	61,8%
<b>Sex</b>	Male	122	50,6%
	Female	119	49,4%
<b>Level of education</b>	None	7	2,9%
	Primary	51	21,2%
	High school	87	36,1%
	Superior	84	34,9%
	Other	12	5,0%
<b>Work</b>	If you work	179	74,3%
	Does not work	62	25,7%
<b>Income</b>	Less than basic salary	85	35,3%
	Basic salary	82	34,0%
	Greater than basic salary	74	30,7%

Source: Database

Elaboration: Authors

Table 2. The relationship to the domains of the IMEVID test is demonstrated, it was evidenced that more than half of the people surveyed have inadequate nutrition, physical activity, information about diabetes, and emotions; in contrast in the dimensions referring to adherence to treatment, tobacco and alcohol consumption that were found as adequate according to the applied survey.

**Table 2. Domains of the IMEVID test of adults with type II diabetes mellitus who attend the "Pumapungo" health center, Cuenca 2022-2023.**

Domains		Frequency n=241	Percentage 100%
<b>Nutrition</b>	Adequate	77	32,0%
	Inadequate	164	68,0%
<b>Physical activity</b>	Adequate	41	17,0%
	Inadequate	200	83,0%
<b>Tobacco use</b>	Adequate	207	85,9%
	Inadequate	34	14,1%
<b>Alcohol consumption</b>	Adequate	188	78,0%
	Inadequate	54	22,0%
<b>Diabetes Information</b>	Adequate	67	27,8%
	Inadequate	174	72,2%
<b>Emotions</b>	Adequate	41	17,0%
	Inadequate	200	83,0%
<b>Adherence to treatment</b>	Adequate	48	19,9%
	Inadequate	193	80,1%

Source: Database

Elaboration: Authors

Table 3. Corresponding to the lifestyle of the 241 adults with type II diabetes mellitus who attend the "Pumapungo" health center, more than half have an inadequate lifestyle corresponding to 67.6% (n=163) and only 32.4% (n=32.4) have an adequate lifestyle, fulfilling the second specific objective of the research work.

**Table 3. Lifestyle of adults with type II diabetes mellitus who attend the "Pumapungo" health center, Cuenca 2022-2023.**

Variable	Frequency n	Percentage %
Ethyl of suitable life	78	32,4%
Inadequate lifestyle	163	67,6%
<b>Total</b>	<b>241</b>	<b>100%</b>

Source: Database

Elaboration: Authors

Table 4. When analyzing the relationship between age and lifestyle, statistical significance was found (p-value = 0.041) with a 95% confidence interval of 0.186-0.381. It should be noted that in both adult ranges there is an inadequate lifestyle with a higher incidence in middle adulthood (n=108).

**Table 4. Relationship between age and lifestyle.**

Variable	Lifestyle		Total	ABOUT <sup>2</sup> P-value IC95%
	Adequate n	Inadequate n		
<b>Age</b>				
Early adulthood	37	55	92	4,19
Middle Adulthood	41	108	149	0,041 0,186-0,381
<b>Total</b>	78	163	241	

Source: Data form.

Elaboration: Authors.

Table 5. With reference to sex, 163 participants presented an inadequate lifestyle, predominating in men with 98 in contrast to the female sample (n = 65), which is statistically significant as it has a p value = 0.000 (95% CI 0.095-0.244).

**Table 5. Relationship between sex and lifestyle.**

Variable	Lifestyle		Total	ABOUT <sup>2</sup> P-value IC95%
	Adequate n	Inadequate n		
<b>Sex</b>				
Male	24	98	122	12,18
Female	54	65	119	0,000 0,095-0,244
<b>Total</b>	78	163	241	

Source: Data form.

Elaboration: Authors.

Table 6. The relationship between the variable level of education included for the association analysis is shown, it was evidenced that at all levels inadequate lifestyle predominates; however, at the secondary level there was a higher frequency (n = 87) and unhealthy lifestyle habits were found in 65 people, this has a p value = 0.001 (95% CI 1.737-1.972).

**Table 6. Relationship between level of education and lifestyle.**

Variable	Lifestyle		Total	ABOUT <sup>2</sup> P-value IC95%
	Adequate n	Inadequate n		
<b>Level of education</b>				
None	2	5	7	19,11
Primary	10	41	51	0,001
High school	22	65	87	1,737- 1,972
Superior	35	49	84	
Other	9	3	12	
<b>Total</b>	78	163	241	

Source: Data form.

Elaboration: Authors.

Table 7. When associating employment status with lifestyle, the sample showed that 179 people worked, of which 124 people had an inadequate lifestyle; while of the 62 people did not have a job, more than half (n=39) also had bad healthy habits. However, this is not statistically significant as it has a  $p = 0.358$  (95% CI 0.145-0.012).

**Table 7. Relationship between work and lifestyle.**

Variable	Lifestyle		Total	ABOUT <sup>2</sup> P-value IC95%
	Adequate n	Inadequate n		
<b>Work</b>				
If you work	55	124	179	0,854
Does not work	23	39	62	0,358
				0,145-0,012
<b>Total</b>	78	163	241	

Source: Data form.

Elaboration: Authors.

Table 8. In the economic income it was evidenced that more frequently adults with type II diabetes mellitus who attend the health center "Pumapungo" have a salary lower than the basic with a total of 85 people of which 65 have an adequate lifestyle, observing a value  $p = 0.002$  (95% CI 0.522- 0.0738) being statistically significant.

**Table 8. Relationship between income and lifestyle.**

Variable	Lifestyle		Total	ABOUT <sup>2</sup> P-value IC95%
	Adequate n	Inadequate n		
<b>Income</b>				
Less than the basic salary.	20	65	85	11,26
Basic salary.				0,002
Higher than the basic salary.	23	59	82	0,522- 0,0738
	35	39	74	



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<b>Total</b>	78	163	241
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Source: Data form.

Elaboration: Authors.

### **Discussion**

Healthy lifestyles are one of the most important determinants when it comes to the prevention and non-pharmacological treatment of diabetes mellitus of any kind. Cristina Cerón Souza indicates, in her article published in Pasto, Colombia, that deaths from complications of this condition are avoidable if the population that is at risk or already suffers from the disease acquires healthy habits such as: healthy and balanced diet, continuous physical exercise, not consuming toxic substances; and in the case of people who are going through this pathology, good therapeutic adherence should be added (14).

In the present research on "Lifestyle in adults with type II diabetes mellitus who attend the Pumapungo health center. Cuenca, 2022-2023", in terms of sociodemographic characteristics, it was found that the male sex has a predominance of 50.6%, most of the respondents belong to middle adulthood (61.8%). The level of education was 36.1% corresponding to the secondary grade, in the work it was obtained that most of the participants work (74.3%) and have an income lower than the basic salary with a percentage of 35.3%; in contrast to the research of Cesar Cantú (15) in which there is a discrepancy in the sociodemographic results by having more female participants who mostly do not work because an incomplete level of primary education predominated.

In relation to the IMEVID survey used in this research, it has 7 relevant dimensions in the lifestyle of diabetic people. To begin with, in the nutrition domain it was determined that it is inadequate in 68% of the sample; finding similarity in the article by Pedro Martínez (16), where he points out that 63% of his respondents have poor nutrition.

Within the physical activity dimension, the result obtained was inadequate with 83% while in the research "Association of domains (lifestyle) of the IMEVID survey, with glycemia, in patients with type 2 diabetes" (17), the information differs because in this only 25.71% of the sample does not perform an adequate exercise routine.

In the article by Sergio Quiroz Gómez and associates (18) in which the IMEVID instrument was used, it showed a high percentage in the dimensions of tobacco and alcohol consumption with 96.8% and 89.2% respectively, in contrast to the present research that low percentages were obtained, these being 14.1% and 25.7%.

Regarding the dimension of information on diabetes, it was obtained that 72.2% are inadequate similar data in the study "Lifestyles and demographic factors associated in patients with Diabetes Mellitus" (19) in which 60.2% were presented; it should be noted that these figures also reflect the lack of attendance or participation in support groups corroborated by Gómez Patricia, Sosa Antonio, and Martín Mario, since it was shown that only 31.3% of its population go to a mutual aid circle.

Regarding the emotion domain of the study, a high percentage related to inadequate control was found, this being 83%, analogous with the article published in Costa Rica entitled "Lifestyle in adult patients with type 2 diabetes mellitus" (17) in which the same percentage was obtained.

Finally, in the last dimension, in the study "Adherence to treatment and knowledge of the disease in patients with type 2 diabetes mellitus" (20) indicates that 72.5% have a good adherence to treatment, obtaining similar data in the present research work with a result of 80.1%, emphasizing that in both cases diabetic people have a correct pharmacological adherence.

Regarding the total result of the IMEVID survey, it was evidenced that 67.7% of the participants of the research project have an inadequate lifestyle, similar to the article entitled "Relationship between lifestyle and metabolic control in patients with type 2 diabetes mellitus from Chota, Peru" (17) where the total was 74.5%; which is corroborated in the study by Vidal, Velasco, Ossa, Fernández and Hurtado (21), in which they used the same instrument of the present research work where it was obtained that 61.7% of the respondents do not have a healthy lifestyle.

Regarding the association that was made in the research presented, when analyzing the sociodemographic characteristics, the predominant age was middle adulthood (45-64 years) of which 108 users present an inadequate lifestyle, which is similar to the study conducted by Oscar Alfredo Utrilla Domínguez (70); in the east it was obtained that, Of 67 participants, more than half (n=38) belong to middle adulthood and also reported an inadequate lifestyle.

The second aspect to take into account is sex, which in our study showed a higher male frequency, of which 98 had a bad lifestyle, similar data were obtained in the article "Sociodemographic, labor, conditions, habits, lifestyles and diabetes mellitus in workers with subsistence jobs, Medellín-Colombia" (21) with a total of 395 men, where 247 of them had an inadequate lifestyle.

Regarding the work condition in the research "Lifestyle and metabolic control in patients with type 2 diabetes mellitus who attend a mutual help club" (20) using the IMEVID test it was identified that more than half of the sample do not work (n = 50) and usually perform tasks at

home, also revealing that they have unfavorable lifestyle habits when obtaining that, Of this group 47 have an inadequate way of living, contrary to our study where 179 of the respondents have a job and of these, 124 do not have a healthy lifestyle habit.

In reference to the level of academic education, the educational grade most often was the secondary in which 65 of the individuals have an inadequate lifestyle, similar to the article "Relations between social inequalities and type 2 Diabetes Mellitus" (22), in which it was determined that in China, Hong Kong, Taiwan, In Denmark and Portugal, low schooling is associated with an inappropriate lifestyle. Corroborating this fact in the research of Weng, Coppini and Sönksen (23) that found the existence of a poor fulfillment of healthy activities, including poor control of diabetes and nutrition at a lower educational level.

Finally, in the study that was developed by Palomo and Yarlequé (24) they found that the economic income of people with diabetes is not significant to determine whether or not they have an adequate lifestyle. On the contrary, in our research project it was possible to establish statistical significance in this relationship, obtaining that most of the participants have an economic income lower than the basic salary (n = 83), and more than half (n = 65) do not have an adequate lifestyle.

### **Conclusions**

According to the data obtained from the research carried out and according to the objectives set out in it, we can conclude that:

- Adults with type II diabetes mellitus who attend the Pumapungo health center in the city of Cuenca have an inadequate lifestyle with 67.6%.
- In the research, the majority of participants were middle-aged males with a level of secondary academic education who largely have a job, however, their income is less than the basic salary.
- Finally, a statistically significant association was found between lifestyle and the variables age, sex, education and income with a p value < 0.05.

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