



Relationship of the Self-perception of Lifestyle with Level of Physical Activity in People with and without Type 2 Diabetes

Briseida Mayel Perez-Avelino¹, Nicolás Padilla-Raygoza^{2*},
Verónica Benitez-Guerrero³, María Luisa Sánchez Padilla⁴,
Vicente Beltrán-Campos⁵ and María de Lourdes García-Campos⁵

¹School of Nursing No. 1, Autonomous University of Guerrero, Chilpancingo de los Bravos, Mexico.

²Department of Nursing and Obstetrics, Division of Health Sciences and Engineering, Campus Celaya-Salvatierra, University of Guanajuato, Celaya, Mexico.

³Nursing Unit, Institute of Health Sciences, Autonomous University of Nayarit, Tepic, Mexico.

⁴Institute of Health Sciences, Autonomous University of the State of Hidalgo, Pachuca, Mexico.

⁵Department of Clinical Nursing, Division of Health Sciences and Engineering, Campus Celaya-Salvatierra, University of Guanajuato, Celaya, Mexico.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2019/v38i330186

Editor(s):

- (1) Dr. Muhammad Chutiyami, Lecturer, Shehu Sule College of Nursing and Midwifery Damaturu, Yobe State, Nigeria.
- (2) Dr. Shankar Srinivasan, Department of Health Informatics, University of Medicine and Dentistry of New Jersey, USA.
- (3) Giuseppe Murdaca, Clinical Immuno Logy Unit, Department of Internal Medicine, University of Genoa, Viale Benedetto, Genova, Italy.

Reviewers:

- (1) Jose Luis Turabian, SESCAM, Spain.
- (2) Miihue-Yobe, Togenu, Nigeria.
- (3) E. Siva Rami Reddy, Tantia University, India.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/50966>

Original Research Article

Received 01 July 2019
Accepted 06 September 2019
Published 14 September 2019

ABSTRACT

Objective: To determine the relationship of the perception of lifestyle with the level of physical activity in people with type 2 diabetes and without type 2 diabetes.

Study Design: Analytical cross-sectional observational study in Celaya, Guanajuato, Mexico.

Methodology: Sample composed of 100 people with type 2 diabetes and 100 people without type 2 diabetes, the lifestyle questionnaire and IPAQ questionnaire were used. Descriptive statistics

*Corresponding author: Email: padillawarm@gmail.com, raygosan@ugto.mx;

were calculated for sociodemographic variables; it was calculated Chi-square test and Odds Ratio. To demonstrate the statistical significance of results, the value of P was set at .05. Statistical analysis was performed in STATA 13.0 ®.

Results: In patients with Type 2 Diabetes predominated females, married, who never went school and elementary and $BMI \geq 25 \text{ kg/m}^2$; among patients without Type 2 Diabetes, predominant males, singles, went school or university, $BMI \geq 25 \text{ kg/m}^2$; no relationship was found between lifestyle perception and level of physical activity in adults with type 2 diabetes ($X^2 = 0.0022$ gl 1 $P = .96$) neither it was found a significant relationship between lifestyle perception and level of physical activity in adults without type 2 diabetes ($X^2 = 5.23$ gl 1 $P = .02$ RM = 2.85 95% CI = 0.80 to 10.4).

Conclusion: The results show that self-perception of lifestyle and physical activity is different in people with less age, more schooling, males.

Keywords: Physical activity; diabetes; self-perception of lifestyle.

1. INTRODUCTION

Type 2 diabetes mellitus (T2D) is a chronic degenerative disease with a prolonged latency period that represents a burden for health services, for the patient, the family, the community and the country [1]. T2D is a metabolic alteration of carbohydrates, with deficit in the production or release of insulin, increasing blood sugar levels [2]. This chronic disease and its complications are one of the main causes of death in Mexico, only surpassed by cardiovascular diseases for 2017, with a total of 75,637 deaths [3] and with more than 331.13 new cases per 100,000 population at year [4].

According to the Official Mexican Standard for the prevention, treatment and control of diabetes, people at risk of developing diabetes are considered to be those who are overweight / obese, sedentary, first-degree relatives with diabetes, age equal to or greater than 65 years, women with a history of pregnancies with macrosomic products or with gestational diabetes [5].

The lifestyle is defined as the perception that an individual has of his place in existence, in the context of the culture and the value system in which he lives and concerning, his objectives, his expectations, his norms, his concerns [6]. Despite the benefits of a healthy lifestyle for both, the control of T2D or to delay its occurrence in those with risk factors, many of them do not maintain a healthy lifestyle [7]. Health can be affected by lifestyle and living conditions. The lifestyle includes attitudes and values, which are expressed in the behaviour of the individual in different areas of life, including physical activity, food, the use of alcoholic beverages, the use of cigarettes, the excessive alcohol intake and the management of sexuality, as well as the social,

physical, cultural, and economic aspects that impact people's lives [8]. Currently, physical activity is anybody movement produced by skeletal muscles that requires energy expenditure [9].

The limited physical activity that exists in the lifestyles of society has manifested the importance of performing some sport, becoming a social necessity to reduce risks of presenting degenerative chronic diseases such as diabetes, thus having the opportunity to maintain a healthy lifestyle in people with T2D [8].

The offspring of people with T2D, share the same environment, the same culture, maybe the same meals, the same attitude on physical activity, that people with the disease.

The main objective of the research was to determine the relationship of the perception of lifestyle with level of physical activity in people with T2D and their offspring without T2D.

2. METHODOLOGY

2.1 Study Design

Cross-sectional, observational, analytic.

2.2 Study Setting

Mutual Assistance Group (MAG) of Celaya, Guanajuato, Mexico, with registered people with T2D, and one of their offspring.

2.3 Sampling

Patients with T2D registered in MAG in Celaya were 186 and of them, 12 did not attend to the session of the group; from 174 patients were

selected using a random number from Epidat 4.2, 2016 (Xunta de Galicia, OPS, OMS, Universidad CES), like simple random sampling. From each patient, we ask the number of offspring, and by drawing, it was selected one of their offspring.

2.4 Selection of Participants

The inclusion criteria for people with T2D were all persons with T2D registered in the MAG of Celaya, Mexico, adults who voluntarily agree to participate in the study, signing the informed consent, whether male or female. The exclusion criteria were subjects with T2D, hospitalized or who do not agree to participate in the study.

The inclusion criteria for people without T2D were offspring for people with T2D registered in the MAG of Celaya, Mexico, with 18 years of age or older, who voluntarily agree to participate in the study, signing the informed consent, whether male or female. The exclusion criteria were the offspring of people with T2D who have not agreed to participate.

2.5 Variables

2.5.1 Sociodemographic

Age, gender, civil status, weight, height, Body Mass Index (BMI).

2.5.2 Independent

Self-perception of lifestyle. Dichotomous categorical variable, which can be called habits in terms of physical activity, food, smoking, alcohol consumption; its unhealthy measurement scale is 0-39 points and healthy 40-78 points measured with the lifestyle perception questionnaire [10]; It is summarized with frequencies and percentages.

2.5.3 Dependent

Physical activity level Ordinal categorical variable; It is defined as any bodily movement produced by skeletal muscles that require energy expenditure; it is measured with the International Physical Activity Questionnaire (IPAQ) [11], with mild categories with 0 to 599 METS /min/week, moderate/vigorous with 600 or more METS /min/week; It is summarized with frequencies and percentages.

2.6 Data Collection Instruments

The lifestyle perception questionnaire was used, which consists of 78 items with a dichotomous answer of YES or No; it is dichotomized in unhealthy from 0 to 39 points and healthy from 40 to 78 points; It has a reliability of 0.9 Kappa intraobserver and 0.89 Kappa interobserver. For the physical activity, the IPAQ short version in Spanish was used with questions of vigorous, moderate activities and walking as well as sitting in the last seven days; the result is transformed to METS / minute week; It has a Kappa reliability of 0.89 [12].

2.7 Procedures

Participants were explained the objectives of the study, as well as the advantages and disadvantages of participating. They were asked to sign the informed consent. After doing so, we proceeded to administer the lifestyle perception and the IPAQ questionnaires, and measure anthropometry.

2.8 Sample Size

Assuming that there is a ratio of 9 among those with an unhealthy and healthy lifestyle, expecting 75% to be perceived with an unhealthy lifestyle and 50% with a healthy lifestyle, the minimum sample size is 37 with a perception of Unhealthy lifestyle and 331 with perception of healthy lifestyle, with 95% accuracy and 80% power (Epi Info, 7.1.3.0, 2013, CDC, Atlanta, GA, USA).

2.9 Statistical Analysis

Descriptive statistics were used for the sociodemographic variables. To show a relationship between perception of lifestyle and level of physical activity, a Chi-square test and P-value, Odds Ratio (OR) and 95% confidence intervals (95% CI) were calculated. To demonstrate the statistical significance of the results, the value of *P* was set at .05. Statistical analysis was performed in STATA 13.0® (Stata Corp., College Station, TX, USA).

3. RESULTS AND DISCUSSION

The sample consisted of 100 individuals with type 2 diabetes (T2D) and 100 people without T2D, where they named female persons with T2D (70%) and men without T2D (74%), individuals with marital status married to T2D

(67%) and single without T2D (45%), people with no schooling with T2D (28%) and high school-university without T2D (25%), adults with a body mass index (BMI) greater than 25 kg/m² with T2D (81%) and greater than 25 kg/m² without T2D (75%). It was found that people with T2D have a higher BMI with a range of 19.39-58.59 kg / m² and although the BMI range in people without T2D is lower, BMI is still high with a range of 17.44-47.63 kg / m² (Table 1).

In the MAG the mild level of physical activity predominates in people with T2D (74.00%) and mild in people without T2D (60.00%) and the perception of a healthy lifestyle in people with

T2D is 96.00% and healthy in people without T2D is 85.00% (Table 2).

In adults with T2D of MAG Celaya, there was no relationship between lifestyle perception and physical activity, P = 0.96 (Table 3).

In the MAG there is a significant relationship between the perception of lifestyle and level of physical activity in adults without T2D obtaining a P-value less than 0.05, marking that people who have a level of mild physical activity, have 2.85 times more likely to have non-healthy lifestyle (OR = 2.85), although the 95% CI includes 1 and it is not significant (Table 4).

Table 1. Distribution of categorical sociodemographic variables by group

Variables	Subjects with T2D		Subjects without T2D			
	f	(%)	f	(%)		
Gender	Female	70	30	70.00	26	26.00
	Male			30.00	74	74.00
Civil Status	Single	13	13.00	45	45.00	
	Married	67	67.00	38	38.00	
	Divorced	3	3.00	3	3.00	
	Separate	4	4.00	1	1.00	
	Widowed	9	9.00	12	12.00	
	Free Union	4	4.00	1	1.00	
Schooling	Nothing	28	28.00	16	16.00	
	Elementary	27	27.00	13	13.00	
	Secondary	19	19.00	18	18.00	
	High School	12	12.00	25	25.00	
	University	12	12.00	25	25.00	
	Postgraduate	2	2.00	3	3.00	
Body mass index	>25 kg/m ²	81	81.00	75	75.00	
	<25 kg/m ²	19	19.00	25	25.00	
Age (years)	Mean ± SD	56.12 ± 10.26		34.94 ± 12.60		
Weight (kg)	Mean ± SD	74.70 ± 16.60		71.87 ± 16.10		
Height (m)	Mean ± SD	1.60 ± 0.10		1.60 ± 1.00		
Body Mass Index (kg/m ²)	Mean ± SD	29.13 ± 5.48		27.96 ± 4.93		

T2D Type 2 Diabetes

Table 2. Distribution of study variables

Variables	With T2D		Without T2D		
	f	%	f	%	
Physical activity	Mild	74	74.00	60	60.00
	Moderate/Vigorous	26	26.00	40	40.00
Lifestyle perception	Non-healthy	4	4.00	15	15.00
	Healthy	96	96.00	85	85.00

T2D Type 2 Diabetes

Table 3. Distribution of lifestyle perception and level of physical activity in people with type 2 diabetes

Variables	Physical activity level			
	Mild		Moderate/Vigorous	
Lifestyle perception	f	%	f	%
Non-healthy	3	75.00	1	25.00
Healthy	71	73.96	25	26.04

$\chi^2= 0.0022$ $df 1$ $P=.96$

Table 4. Distribution of lifestyle perception and level of physical activity in people without type 2 diabetes

Variables	Physical activity level			
	Mild		Moderate/Vigorous	
Lifestyle perception	f	%	f	%
Non-healthy	13	86.67	2	13.33
Healthy	47	55.29	38	44.71

$\chi^2= 5.23$ $df 1$ $P=.02$ $OR= 2.85$ $95\%CI = 0.80$ a 10.4

The sociodemographic characteristics from our samples are different; in subjects with t2d predominated the females, married, with nothing or elementary school; in their offspring, without t2d, predominated the males, with high school, singles (Table 1). In our sample, we found there is not relationship between the self-perception of lifestyle and level of physical activity among patients with T2D but there is a relationship between these variables in people without T2D.

In the investigation, by Cantú Martínez, the population with T2D had a prevalence of female gender (72.3%), marital status, married (69.2%), with primary schooling completed (49.2); being similar to the sample data in the MAG Celaya [13]. Piñón et al., in their research with people without T2D obtained a prevalence of the female gender (71.9%), with a finished high school education (64.5%); being similar to the results obtained in the MAG Celaya [14].

Piñón et al., agree with the data obtained in the MAG since in their study a low level of physical activity predominates with 48.8% in people without T2D [14].

According to Cantú Martínez, in his study conducted in 2015 in various Urban Health Centers of the Metropolitan Area of Monterrey, México, with a sample of 65 people with T2D, he tells us that 29.23% considered having a “good lifestyle”, percentage which corresponded to a “healthy” classification, while the highest concentration has an inadequate lifestyle (70.77%), with two classifications of the participants; then, 56.92% is characterized by

“moderately healthy” behaviour and only 13.85% of these were classified as “unhealthy”. A significant correlation was detected between the evaluated lifestyle and the dimensions considered, except with the emotional state [13].

Regarding the physical activity carried out by the patients in the study, the inquiries showed that 20% have a “good lifestyle” and a “healthy” classification, however, 80% show an “inappropriate lifestyle” “”, which is reflected in 47.6%,” moderately healthy “; 20% is “unhealthy” and 12.3% “unhealthy”. There is an average of 53 and a variation of 25, in the average lifestyle, considered “moderately healthy” for this population [13]. Considering different results with the research in celaya, mexico, since there is no relationship between perception of lifestyle and level of physical activity in adults with T2D.

Piñón et al., In their study, conducted in 2015 with participants of a program of healthy habits and lifestyles in the municipality of popayán colombia, with a sample of 217 participants without t2d, with respect to the level of physical activity measured with ipaq , the study reports a general prevalence of 3.22% around the performance of vigorous physical activity; with an average of 181 minutes / week, in terms of moderate physical activity the prevalence was 15.1%, 223 minutes / week; the general prevalence of low physical activity was 70.3% in which subjects who performed less than three days of moderate activity were classified, having a significant relationship between the perception of lifestyle and level of physical activity [14]. Therefore, this study yielded the same results to

this research, marking a relationship between lifestyle perception and level of physical activity in adults without T2D. In a study with 150 people with T2D, in India, 60% had BMI greater than 25 kg / m² and reported that only 8% did some type of exercise or walked at least 4 days a week; 58% ate more than 3 times a day but only once a week [15], which is considered a healthy measure, eat five times a day but in smaller quantities. The population of Celaya with T2D, reported 74% of the participants doing mild physical activity. Yuing et al., In a meta-analysis show that physical activity, with monitoring and surveillance of patients with T2D, improves glycosylated hemoglobin levels [16]. It would be desirable that our patients with T2D perform more exercise with monitoring to improve their biochemical parameters and that their children who do not yet develop the disease, the exercise will probably cause their appearance to be delayed.

A disadvantage of the study, is that groups are not comparable, because the basal characteristics are different, but the data show differences in self-perception of lifestyle among the people with T2D and their offspring, without T2D.

4. CONCLUSION

In the study carried out it was found that there is no relationship between the self-perception of lifestyle and the level of physical activity, in people with T2D, neither in their offspring. The differences could be because of more schooling or more awareness about the needed to live with a healthy lifestyle in people more younger. It is needed to increase the sample size to obtain a significative relationship.

CONSENT

All authors declare that 'written informed consent was obtained from of the study participants for publication of this investigation. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

The protocol was reviewed and approved by the Bioethics Committee of the Division of Health Sciences and Engineering of the Celaya-Salvatierra Campus of the University of

Guanajuato, with registration number CIBCSIC-1381310.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Velázquez O, Lara A, Martínez MY, Márquez F. Integrated detection as an instrument to link primary prevention, early treatment and epidemiological surveillance in diabetes and high blood pressure. *Rev Endocrinol y Nutr.* 2000;8(4):129-135.
2. Mexican Diabetes Federation. The numbers of diabetes in Mexico; 2008. Available:http://www.fmdiabetes.org/v2/paginas/d_numeros.php
3. Instituto Nacional de Geografía, Estadística, Informática. Causes of death. Total General Deaths by Main Causes of Mortality; 2008. Available: <http://www.inegi.org.mx>
4. Instituto Nacional de Geografía, Estadística, Informática. Number of diabetes cases per 100 thousand inhabitants; 2017. Available: <http://www.inegi.org.mx>
5. World Health Organization. Quality of Life; 2005. Available:<http://vidacalida.blogspot.com/2010/12/oms-calidad-de-vida-2005.html>
6. Ministry of Health. Modification to the Official Mexican Standard NOM-015-SSA2-1994, for the prevention, treatment, control of diabetes mellitus in primary care to become the Official Mexican Standard NOM-015-SSA2-1994, for prevention, treatment and control of diabetes. Available:<http://salud.gob.mx/unidades/cdi/nom/m015ssa24.htm>
7. World Health Organization. Global Strategy on Diet, Physical Activity and Health; 2005. Available:<https://www.who.int/dietphysicalactivity/pa/es/>
8. Guerrero Montoya LR, León Salazar AR. Lifestyle and health. *Educere.* 2010;14(48):13-19. Available:<http://www.redalyc.org/articulo.oa?id=35616720002>
9. Muñoz Diaz JC. Habits and lifestyles in relation to physical activity in primary education. *Revista Digital.* 2004; 10(79): 1/1.

- Available:<https://www.efdeportes.com/efd79/habitos.htm>
10. Baños Benitez A, Gallart-Magaña G. Application of style questionnaires healthy lives for students and teachers of the Latin American school of Medicine. Memories of the First Congress of Health, Quality of Life and Environment. 2005;SCV004.
 11. Ruiz JR, Ortega FB. Physical activity and cardiovascular disease risk factors in children and adolescents. *Curr Cardio Risk Rep.* 2009;3(1):281-7. DOI:<https://doi.org/10.1007/s12170-009-0043-6>
 12. Booth ML. Assessment of physical activity: An international perspective. *Research Quarterly for Exercise and Sport.* 2000;71(2):114-20.
 13. Cantú Martínez PC. Lifestyle in adult patients with type 2 diabetes mellitus. *Enfermería Actual en Costa Rica.* 2014; (27):1-14.
 14. Vernaza-Pinzón P, Villaquiran-Hurtado A, Paz-Peña CI, Ledezma BM. Risk and level of physical activity in adults, in a program of healthy lifestyles in Popayán. *Revista de Salud Pública.* 2017;19(5):624-30. Available:<https://doi.org/10.15446/rsap.V19n5.53042>
 15. Shukla A, Baghel AS, Vyas M. Diet and lifestyle-related factors associated with Apathyanimittaja Prameha (Type 2 diabetes): A cross-sectional survey study. *Ayu.* 2018;39(4):199–207. Available:http://doi.org/10.4103/ayu.AYU_108_16
 16. Yuíng T, Lizana PA, Berral FJ. Hemoglobina glicada y ejercicio: Una revisión sistemática. *Rev Med Chile.* 2019; 147(4):480-9. Available:<http://doi.org/10.4067/S0034-98872019000400480>

© 2019 Perez-Avelino et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle3.com/review-history/50966>