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Knowledge level on gestational diabetes among pregnant women in a secondary-level hospital

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Abstract
Objective: To determine the level of knowledge about gestational diabetes in pregnant patients at a secondary-level hospital.
Materials and Methods: This is an analytical, cross-sectional, observational study conducted with 374 pregnant women at the Regional General Hospital of Orizaba. They were administered an instrument measuring knowledge levels about risk factors and maternal-fetal complications of gestational diabetes. The study was carried out from February to September 2024. Descriptive statistics were used to obtain frequencies and percentages for qualitative variables, while quantitative variables were expressed through measures of central tendency. Inferential statistics were used to analyze the association between knowledge level and sociodemographic and/or clinical factors (age, marital status, education, occupation, locality, socioeconomic level, comorbidities, history of diabetes).
Results: A statistically significant association was found between knowledge level and factors such as education ($p < 0.0001$) and socioeconomic status ($p < 0.0001$), highlighting the importance of comprehensive nutritional care and education as key pillars in the prevention and treatment of gestational diabetes.
Conclusions: This study confirms that the level of knowledge about gestational diabetes among pregnant women treated at a secondary-level hospital is insufficient to adequately address the risks associated with this condition, thus supporting the alternate hypothesis proposed at the beginning of the study. The significant relationship between knowledge and factors such as education, socioeconomic status, and nutritional status reveals critical areas where educational interventions should be focused.

Keywords: Gestational diabetes, pregnancy, maternal-fetal complications

Introduction

Gestational diabetes represents one of the most common complications during pregnancy, with significant implications for maternal and fetal health. Characterized by the alteration in glucose metabolism that manifests itself for the first time during pregnancy, it has shown an increase in its prevalence globally, especially in contexts where access to health education and timely medical services is limited [1].

In Mexico, the approach to gestational diabetes faces structural and educational challenges that directly impact prevention, early diagnosis, and proper management of the disease. Various studies have shown that the level of knowledge of pregnant women about this pathology is a determining factor in adherence to treatment, metabolic control and the reduction of perinatal complications. [2]

Gestational diabetes is a complication of pregnancy, which in recent years has increased suddenly, being present in 1 in 10 pregnancies worldwide. The International Diabetes Federation (IDF) in 2013 states that the estimated prevalence of GD in Southeast Asia was 25%, in North America and the Caribbean it was 10.4%, and in developed countries of northern Europe it was less than 2%. However, it is estimated that in Latin America the incidence ranges between 15-25% of women who will have gestational diabetes during one of their pregnancies. In 2014, according to surveys by ENADID and INEGI, nationwide, 51 women out of every 100,000 were graduates with a diagnosis of gestational diabetes. For 2020, according to INEGI's national surveys, 11.4 cases per 100,000 inhabitants were reported nationwide, a notable decrease compared to the last decade at the national level. In the state of Veracruz, the incidence is between 9 and 17.21 cases per 100 thousand inhabitants. Currently, in Mexico, gestational diabetes is in 8th place as a direct cause of maternal death in Mexico, according to health statistics reported by the Ministry of Health in 2022. The prevalence of gestational diabetes in Mexico is 8.7 to 17.7%. This disease can trigger multiple complications for both the mother and the fetus such as fetal macrosomia, congenital malformations, obstetric hemorrhages, hypertensive diseases of pregnancy, respiratory distress syndromes of the newborn, etc [3, 4].

This work focuses on evaluating the level of knowledge about gestational diabetes in pregnant women treated in a second-level hospital, with the aim of identifying educational gaps and proposing strategies that strengthen comprehensive care from a preventive and community perspective. Through a quantitative approach, it seeks to establish the relationship between knowledge of the disease and sociodemographic and clinical variables, such as educational level, body mass index, and medical history. For

its subsequent analysis with the X2 test between the sociodemographic and clinical factors of pregnant patients, in order to corroborate the alternative hypothesis that the level of knowledge of pregnant women in a second-level hospital is low, or the null hypothesis, which establishes that the level of knowledge about gestational diabetes is good.
That is why the following question arises: ¿What is the level of knowledge about gestational diabetes in pregnant patients in a second-level hospital?

Materials and methods

Cross-sectional, observational, analytical, prospective study, carried out at the Regional General Hospital of Orizaba No. 1, between February 2024 and September 2024, all this being after the approval of the Health Ethics and Research Committee 3101, obtaining the institutional registration number R-2024-3101-003, after signing consent, permission was requested from the Medical Director of the Regional General Hospital of Orizaba for the start of the collection of data from pregnant women of the gynecology and obstetrics service who were initially asked their sociodemographic data (age, occupation, marital status, place of origin, socioeconomic status) and clinical data (BMI, pre-existing diabetes mellitus, gestational diabetes mellitus and hypertension) were subsequently applied the instrument "Level of knowledge about risk factors and maternal-fetal complications of gestational diabetes" which has a reliability of 0.87 by KR20 and 8.0 by Pérez-Padilla y Viniegra, which was validated and created by staff of the Department of Obstetrics and Gynecology of the Regional General Hospital Number One, of the Mexican Institute of Social Security in the City of Obregón, Sonora, Mexico. This instrument consists of 23 items, and assesses the level of knowledge of gestational diabetes. Ranking into the following categories depending on the score: random (0-8 points), very low (9-11 points), low (12-14 points), fair (15-17 points), good (18-20 points), and very good (21-23 points). The variables included in the study are the following: age, education, place of residence, occupation, number of children, marital status, comorbidities, history of gestational diabetes. Inclusion criteria are pregnant patients between 18 and 45 years of age who attend the different services of said hospital, acceptance to participate in the study, and exclusion criteria are all pregnant women who do not know how to read or write, or with any limitation that prevents the self-applied completion of the evaluation instrument, or that the instrument already filled out is illegible or incomplete. The sample size calculation was obtained using the Question Pro calculator, with a confidence index of 95% margin of error of 5, taking 2500 pregnant women as a base population. Thus obtaining a sample: 344, it was carried out by sampling by quotas until the sample was obtained, later for the analysis of data and statistical aspects. After the data was collected in an Excel sheet, the variables were analyzed using descriptive statistics, the qualitative variables were expressed in frequencies and percentages as well as in tables and graphs, the quantitative variables were expressed through measures of mean central tendency, median and mode, in inferential statistics to analyze the sociodemographic variables and the clinical variables X2 was used considering statistically those in which a $p \leq 0.05$ is obtained are significant.

Table of variables

Number of the variable	Conceptual definition	Operational definition	Variable Type and Scale	Indicator
Age	How long a person or other living being has lived counting from birth	Age range in which the patient is at the time of the survey.	Quantitative Discreet Go on	20-24 25-29 30-34 35-39 40-44
Schooling	Length of time a person attends school to study and learn, especially the length of compulsory education	Maximum level of education received by the surveyed patient	Qualitative Nominal Political Politics	1. Primary 2. Secondary 3. Baccalaureate 4. Bachelor's degree 5. Postgraduate
Occupation	Activity or work performed	Activity or work performed by the patient	Qualitative Nominal Dichotomous	Employee Housewife
Marital status	Situation of natural persons determined by their family relations	Type of relationship reported by the surveyed patient	Qualitative Nominal Polytomics	Single Free union Married Divorced
Number of Quests	Number of live births that the mother has had throughout her life counting the birth of the birth considered	Number of pregnancies that the patient has had during her life	Qualitative Ordinal Polytomics	Primigesta Secundigesta Trigesta Multigesta
Place of origin or residence	Place where someone, under normal circumstances, lives	Place where the patient currently resides. A rural population is considered to be when it has less than 2500 inhabitants, while an urban population is considered to be one with more than 2500 people living	Qualitative Nominal Dichotomous	Urban (>2500 inhabitants) Rural (<2500 inhabitants)

Table of variables

Number of the variable	Conceptual definition	Operational definition	Variable Type and Scale	Indicator
Level of knowledge in gestational diabetes	Amount of knowledge a person possesses about a given topic	It will be achieved through the application of the instrument level of knowledge about risk factors and maternal fetal complications of gestational diabetes that qualifies them as Random (0-8 points), very low (9-11 points), low (12-14 points), fair (15-17 points), good (18-20 points), and very good (21-23 points).	Qualitative	Random Very Low Low Regular Well Very good.
Nutritional status	It is the weight of a person in kilograms divided by the square of the height in meters.	It will be staged by obtaining the body mass index to classify its nutritional status as underweight (<18.5), Normal weight (18.6-24.99), Overweight (25-29.9) and obesity (>30) GI, GII and GIII	Quantitative Nominal	Low weight Normal weight Overweight Obesity
High blood pressure	A condition in which the blood pressure toward the walls of the arteries is too high. Patients with a history of hypertension	Patients with a history of systemic arterial hypertension	Qualitative Dichotomous Nominal	Yes No
Antecedent Gestational diabetes	Previous fact of having had diabetes in previous pregnancy	Patient who has had gestational diabetes during a pregnancy	Qualitative Dichotomous Nominal	Yes No
Pre-existing diabetes	Previous fact of having developed diabetes	Patients with a history of diabetes mellitus.	Qualitative Dichotomous Nominal	Yes No

Ethical aspects

In accordance with the regulations of the General Health Law on research article 109, the ethics committee was in charge of reviewing the risks and benefits of the information, which were the object of the research to guarantee the well-being and rights of patients.

In research involving human beings, it is essential to

1. Indicate the risk of the research in accordance with the Regulations of the General Health Law on Research, and indicate whether it will be carried out on vulnerable populations such as minors, pregnant women or subordinate groups.
2. Indicate whether the procedures adhere to ethical standards, the Regulations of the General Health Law on Research and the Declaration of Helsinki in force.

Describe the risk/reward balance

1. Specify the procedures to be followed to ensure the confidentiality of the information (in the case of studies with biological samples, emphasize how to eliminate data that identifies the subjects).
2. Mention how to select potential participants.

A letter of informed consent was included for all patients who agreed to participate in the study. Specifying the correct and complete completion of all the data, as well as explaining the purpose of the study.

Results

A total of 374 surveys were carried out on pregnant women who were in the first to third trimester of pregnancy, in a second-level hospital of the Mexican Institute of Social Security.

Of the patients surveyed in terms of level of knowledge, 35 (9.36%) obtained a random score, 32 (8.56%) a very low score, a low score 57 (15.24%), with 150 (40.11%) obtaining a regular score, while 80 (21.39%) were good and only 20 (5.35%) scored very well (See Figure 1)

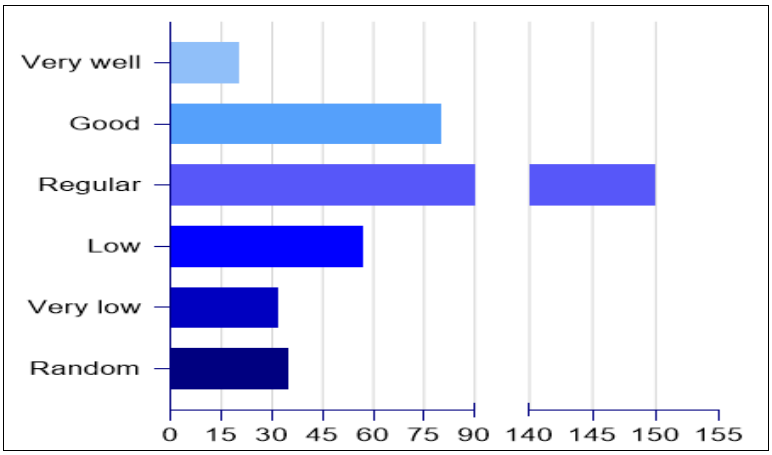

Fig 1: Level of knowledge about gestational diabetes in pregnant women in a second-level hospital

40.11% of pregnant women obtained a regular score. n: 374
In the same way, the association between sociodemographic factors and the level of knowledge about gestational diabetes was carried out, it was observed in the age range of 20-24 years with 144 (38.5%) patients, of which 12 (3.21%) had a random score, 14 (3.74%) obtained a very low score, 22 (5.88%) achieved a low score, 66 (17.65%) have a fair score, 26 (6.95%) have a good score, and 4 (1.07%) have a very good score. Based on the statistical analysis with X^2 between the level of knowledge about gestational diabetes and the age range, a p= 0.2377 was obtained, thus demonstrating that age does not intervene with the level of knowledge about gestational diabetes.

Table 1: Association between age and level of knowledge about gestational diabetes.

Level of knowledge									
	Random	**Very low**	**Low**	**Regular**	**Well**	**Very good**	**Total**	**p**	**X2**
Age Range	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**			
20-24	12 (3.21)	14 (3.74)	22 (5.88)	66 (17.65)	26 (6.95)	4 (1.07)	144	<0.2377	24.11, 20
25-29	14 (3.74)	7 (1.87)	15 (4.01)	27 (7.22)	27 (7.22)	8 (2.14)	98		
30-34	4 (1.07)	6 (1.60)	15 (4.01)	39 (10.43)	16 (4.28)	6 (1.60)	86		
35-39	3 (0.8)	4 (1.07)	3 (0.80)	16 (4.28)	10 (2.67)	1 (0.27)	37		
40-44	2 (0.53)	1 (0.27)	2 (0.53)	2 (0.53)	1 (0.27)	1 (0.27)	9		
TOTAL	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		

Only 20 (5.35%) obtained a very good level of knowledge, of these 4 (1.07%) are between 20-24 years old, 8 (2.14%) between 25-29, 6 (1.6%) between 30-34, 1 (0.27) between 35-39 years old and 1 (0.27%) between 40-44.
Regarding schooling, of the 127 (33.96%) patients with a bachelor's degree, 11 (2.94%) obtained a random score, 17 (4.55%) achieved a very low score, 11 (2.94%) a low score, and 48 (12.83%) average, 37 (9.89%) a good score, and 3 (0.8%) a very good score. A p of less than 0.0001 was acquired through the X2 test, this association being statistically significant.
Regarding the socioeconomic level, 231 of 374 (61.76%) were at a medium level, 20 (5.35%) had a random score, 20 (5.35%) had a very low score, 35 (9.36%) had a low score, and 95 (25.4%) had a regular score, 49 (13.1%) had a good score and only 12 (3.21%) had a regular score. The relationship between the level of knowledge and the variables schooling and socioeconomic level was analyzed using the chi-square test.
The results showed a statistically significant association between the level of schooling and the level of knowledge (X2, p <0.0001). It was observed that as the level of education increases, the proportion of participants with "good" and "very good" levels of knowledge increases, while "random, very low and low" levels predominate in groups with less schooling. A significant association was also identified between socioeconomic level and level of knowledge (X2 p <0.0001). Participants with high socioeconomic status more frequently presented "good" and "very good" levels of knowledge, in contrast to those belonging to the low socioeconomic level, in which the "very low" and "low" levels were concentrated. Taken together, these results indicate that both educational level and socioeconomic level significantly influence the level of knowledge of the participants.

Table 2: Association between sociodemographic factors and the level of knowledge about gestational diabetes

Level of knowledge									
	Random	**Very low**	**Low**	**Regular**	**Well**	**Very good**	**Total**	**P**	**X2**
Schooling	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**			
Primary	9 (2.41)	8 (2.14)	20 (5.35)	36 (9.63)	14 (3.74)	2 (0.53)	89	<0.0001	121.3, 20
Secondary	15 (4.01)	6 (1.60)	22 (5.88)	54 (14.44)	17 (4.55)	2 (0.53)	116		
Baccalaureate	11 (2.94)	17 (4.55)	11 (2.94)	48 (12.83)	37 (9.89)	3 (0.80)	127		
Bachelor's degree	-	1 (0.27)	4 (1.07)	12 (3.21)	12 (3.21)	10 (2.67)	39		
Postgraduate	-	--	-	-	-	3 (0.80)	3		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
Socioeconomic Level									
Low	15 (4.01)	12 (3.21)	21 (5.61)	46 (12.30)	26 (6.95)	1 (0.27)	121	<0.0001	41.21, 10
Medium	20 (5.35)	20 (5.35)	35 (9.36)	95 (25.40)	49 (13.10)	12 (3.21)	231		
High	-	--	1 (0.27)	9 (2.41)	5 (1.34)	7 (1.87)	22		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		

Of the 80 patients with a good level of knowledge, 14 (3.74%) have completed primary school, 17 (4.55%) have completed secondary school, 37 (9.89%) have a bachelor's degree, 12 (3.21%) have a bachelor's degree and none have a postgraduate degree.
Regarding occupation, 240 of 374 (64.17%) patients were engaged in housework, 21 (5.61%) acquired a random score, 21 (5.61%) obtained a very low score, 42 (11.23%) a low score, 93 (24.87%) had a fair score, 52 (13.8%) had a good score and 11 (2.94%) a very good score. with the X2 statistical test, a p equal to 0.6082 was found, thus showing that occupation is not related to the level of knowledge of the patients. If we talk about the place of origin, 206 (55.08%) reside in an urban area, of these 16 (4.28%) had a random score, 14 (3.74%) a low score, 29 (7.75%) a low score, and 95 of these patients (25.40%) a regular score, 41 (10.96%) a good score, and only 11 (2.94% a very good score, through x2 a p score of 0.1611 was obtained, with which no significant association is found in these variables.

Finally, referring to marital status, 180 (48.13%) are in a common-law union, of these 20 (5.35%) have a random score, 13 (8.55%) have a very low score, 28 (18.42%) have a low score, 75 (49.34%) have a regular score, 37 (24.34%) have a good score, and only 7 (4.61%) have a very good score, a p equal to 0.0174 was found. This with the X2 test. Patients with married and divorced marital status showed a greater tendency to have "regular", "good" and "very good" results, in contrast to those patients who are single or in a common-law union where they present a tendency to "random", "very low" and "low" results, thus presenting that marital status significantly influences the level of knowledge, while occupation and place of origin do not. (See table 3)

Table 3: Association of sociodemographic factors with the level of knowledge about gestational diabetes

Level of knowledge									
	Random	**Very low**	**Low**	**Regular**	**Well**	**Very good**	**Total**	**p**	**X2**
Marital status	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**			
Single	9 (2.41)	8 (2.14)	20 (5.35)	36 (9.63)	14 (3.74)	2 (0.53)	89		
Free union	15 (4.01)	6 (1.60)	22 (5.88)	54 (14.44)	17 (4.55)	2 (0.53)	116		
Married	11 (2.94)	17 (4.55)	11 (2.94)	48 (12.83)	37 (9.89)	3 (0.80)	127	0.0174	28.74, 15
Divorced	-	1 (0.27)	4 (1.07)	12 (3.21)	12 (3.21)	10 (2.67)	39		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
Occupation									
Employee	14 (3.74)	11 (2.94)	15 (4.01)	57 (15.24)	28 (7.49)	9 (2.41)	134		
Housework	21 (5.61)	21 (5.61)	42 (11.23)	93 (24.87)	52 (13.90)	11 (2.94)	240	0.6082	3.0601, 5
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
Place of origin									
Urban	16 (4.28)	14 (3.74)	29 (7.75)	95 (25.40)	41 (10.96)	11 (2.94)	206		
Rural	19 (5.08)	18 (4.81)	28 (7.49)	55 (14.71)	39 (10.43)	9 (2.41)	168	0.1611	7.912, 15
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		

Of the 374 patients, 57 (15.24%) obtained a low level of knowledge, 22 (5.88%) are in a common-law union, 42 (11.23%) are engaged in housework, and 229 (7.75%) come from rural areas.

During the research, the association between the patient's risk factors and the level of knowledge was also carried out, from which the following results were obtained. Regarding the number of the patient's pregnancies, 135 (36.1%) patients were secondary, of which 8 (2.14%) had a random score, 15 (4.01%) had a very low score, 26 (6.95%) had a low score, and 48 (12.835) had a regular score, 31 (8.29%) had a good score, and only 7 (1.87%) had a very good score. With the statistical test of X2, a p= 0.3337 was obtained.

In the nutritional status of the patients, 159 (42.51%) were found to be overweight, 12 (3.21%) had a random score, 15 (4.01%) had a very low score, 15 (6.68%) had a low score, 59 (15.78%) had a regular score, 44 (11.76%) had a good score, and only 4 (1.07%) had a very good score. By making the association with X2, we obtained a p with a value of less than 0.0001, thus presenting that patients with BMI in normal weight obtained "regular", "good" and "very good" scores in contrast to those patients with alteration of nutritional status (low weight, overweight and obesity) present a tendency to "low", "very low" and "random" results. presenting that the body mass index presented is associated with the level of knowledge presented by the patients. (See Table 4)

Table 4: Association between risk factors and the level of knowledge about gestational diabetes

Level of knowledge									
	Random	**Very low**	**Low**	**Regular**	**Well**	**Very good**	**Total**	**P**	**X2**
Parity	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**			
Primigesta	12 (3.21)	5 (1.34)	15 (4.01)	53 (14.17)	27 (7.22)	5 (1.34)	117		
Secundigesta	8 (2.14)	15 (4.01)	26 (6.95)	48 (12.83)	31 (8.29)	7 (1.87)	135		
Trigesta	7 (1.87)	6 (1.60)	7 (1.87)	24 (6.42)	15 (4.01)	6 (1.60)	65	0.3337	16.76, 15
Multigesta	8 (2.14)	6 (1.60)	9 (2.41)	25 (6.68)	7 (1.87)	2 (0.53)	57		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
Nutritional status									
Low weight	-	1 (0.27)	4 (1.07)	2 (0.53)	1 (0.27)	-	8		
Normal weight	6 (1.60)	9 (2.41)	13 (3.48)	39 (10.43)	12 (3.21)	15 (4.01)	94		
Overweight	12 (3.21)	15 (4.01)	25 (6.68)	59 (15.78)	44 (11.76)	4 (1.07)	159	<0.0001	48.72, 15
Obesity	17 (4.55)	7 (1.87)	15 (4.01)	50 (13.37)	23 (6.15)	1 (0.27)	113		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		

Of the association between risk factors and level of knowledge, we found that 150 (40.11%) obtained a regular level of knowledge, of these 53 (14.17%) were prime, 48 (12.83%) Secondary digest, 24 (6.42%) triges and 25 (6.68%) multigestation. 2 (0.53%) were underweight prior to pregnancy, 39 (10.43%) normal weight, 59 (15.78%) overweight and 50 (13.37%) obese. Of the patients' risk history with respect to the history of chronic arterial hypertension, 57 of 374 (15.24%) were carriers, 5 (1.34%) had a random score, 4 (1.07%) had a very low score, 11 (2.94%) had a low score, 28 (7.49%) had a regular score, 7 (1.87%) had a good score, 2 (0.53%) had a very good score, and a p of 0.3764 was obtained when statistically associated with X2. Regarding pregestational diabetes, 49 of 374 (13.1%) had this disease, of these 7 (1.87%) achieved a random score, 5 (1.34%) a very low score, 4 (1.07%) a low

score, 21 (5.61%) a regular score, and 12 (3.21%) obtained a good score, being that none achieved a very good score, with X2 a p of 0.2305 was obtained. Finally, patients who developed gestational diabetes in previous or current pregnancies 108 (28.07%) have this history, of these 9 (2.41%) presented a random score, 6 (1.60%) a very low score, 21 (5.61%) low, 45 (12.03%) a regular score, 20 (5.35%) a good score, and 4 (1.07%) a very good score. When the association with X2 was made, a p of 0.4233 was obtained. Of the variables obtained, we did not find a significant association between the variables

Table 5: Association between clinical history and level of knowledge about gestational diabetes

	Level of knowledge								
	Random	**Very low**	**Low**	**Regular**	**Well**	**Very good**	**Total**	**p**	**X2**
HAS	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**			
Yes	5 (1.34)	4 (1.07)	11 (2.94)	28 (7.49)	7 (1.87)	2 (0.53)	57	0.3764	5.334, 5
No	30 (8.02)	28 (7.49)	46 (12.30)	122 (32.62)	73 (19.52)	18 (4.81)	317		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
DM2									
Yes	7 (1.87)	5 (1.34)	4 (1.07)	21 (5.61)	12 (3.21)	-	49	0.2305	6.870, 5
No	28 (7.49)	27 (7.22)	53 (14.17)	129 (34.49)	68 (18.18)	20 (5.35)	325		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		
DG									
Yes	9 (2.41)	6 (1.60)	21 (5.61)	45 (12.03)	20 (5.35)	4 (1.07)	105	0.4233	4.940, 5
No	26 (6.95)	26 (6.95)	36 (9.63)	105 (28.07)	60 (16.04)	16 (4.28)	269		
Total	35 (9.36)	32 (8.56)	57 (15.24)	150 (40.11)	80 (21.39)	20 (5.35)	374		

***SAH:** Systemic arterial hypertension, DM2: Pregestational type 2 diabetes, GD: Gestational diabetes

From the association between clinical history and level of knowledge, it was found that 7 (1.87%) of pregnant women with systemic arterial hypertension have a good level of knowledge, 21 (5.61%) of pregnant women with pregestational diabetes had a regular level of knowledge, and 21 (5.61%) of pregnant women who developed gestational diabetes had a low level of knowledge.

Discussion

The results of the study found that the level of knowledge about gestational diabetes in pregnant women in a second-level hospital is predominantly regular, with 150 (40.11%) obtaining this score, 124 (33.16%) obtaining a score between low, very low, random, and when contrasted with 100/(26.74%) who obtained a score between good and very good, a trend towards a low level of knowledge is shown. This finding is synchronous with the study carried out by the authors Valles Lopez and Cucsani Calisaya which was carried out in 2021 in the city of Lima Peru, this study was, like ours, a descriptive, correlational and cross-sectional study, it was carried out in a population of 150 patients, who presented gestational diabetes, In this study, it was found that only 20% of the patients had a high level of knowledge about their condition, while 51.1% had a medium knowledge and 28.9% had a low knowledge, when performing their statistical analysis with the Spearman correlation test with a p of 0.039. This is similar to the one obtained in our study. This similarity in the results is due to the fact that both studies were carried out in second-level care units, as well as in pregnant and Latin American populations [5].

The association between the level of knowledge and schooling (p less than 0.0001) and socioeconomic level (p less than 0.0001) coincides with what the authors Quintero-Medrano and García Benavente propose in their study "Knowledge about gestational diabetes in pregnant women in a public hospital in northeastern Mexico. Results of a survey" conducted in the city of Obregón, Sonora, Mexico in 2018, this study was carried out in 150 pregnant women whose knowledge about maternal-fetal risk factors and complications related to gestational diabetes was measured, who similarly obtained with the test of x^2 between the association with schooling and the level of knowledge p of 0.046, and in the socioeconomic level a p of 0.002. This correlation is important because it shows an association between sociodemographic factors such as schooling and socioeconomic level with the level of knowledge, showing that the lower the socioeconomic level tends to be the lower the level of knowledge. As well as the higher the level of education, the level of knowledge tends to present better results [6].

On the other hand, the high percentage of pregnant women with overweight (42.51%) and obesity (30.21%) as risk factors coincides with what was described by the authors Lugo León and Naybi Bolaño in their study "Gestational diabetes: risk factors and perinatal complications" carried out in 108 gestational diabetic patients and 108 without diabetes in 2022, who identify the nutritional status especially of those patients with high BMI as one of the main predictors of diabetes and its perinatal complications, finding a p less than 0.0001 showing a relative risk of 4.2. When performing the X2 test between BMI and level of knowledge, a $p < 0.000$ was obtained, which suggests that patients who present a higher metabolic risk should be detected prior to pregnancy, in order to implement multiple strategies for the prevention of complications [7].

Although no association was found with variables such as a history of hypertension, pregestational diabetes, or previous gestational diabetes, studies such as that of Bauzá Tamayo (2022) [3, 8] and Hernández-Ruíz (2023) [9] point out that these conditions increase the possibility of complications, which points to the need to reinforce knowledge in any patient who presents risk factors [8, 9].

These results allow us to identify pregnant women with a low level of knowledge as a clinical risk group. Overall, the results of this study and the bibliography consulted point to an educational gap that must be addressed strategically, strengthening knowledge especially in vulnerable groups in order to prevent and identify in a timely manner the complications that arise and thus reduce maternal-fetal morbidity and mortality. The implementation of educational intervention programs such as those proposed by Cuello

Freire (2023) [10] and Ángeles EA (2022) [11], which in their studies propose a series of strategic interventions that significantly improve knowledge and therapeutic adherence [10, 11].

This work opens the possibility of developing new studies that evaluate the impact of knowledge about GD on the clinical outcomes of pregnancy, thus allowing the identification of the most effective strategies in the different population groups that we face on a daily basis in clinical practice. Likewise, instruments for measuring knowledge about not only gestational diabetes but other complications in pregnancy could be validated, seeking a different direction for each context, whether hospital and/or community, thus contributing to the strengthening of primary care.

Conclusion

This study confirms that the level of knowledge about gestational diabetes in pregnant women treated in a second-level hospital is insufficient to adequately address the risks associated with this pathology. In this way, corroborating the alternative hypothesis of this study, it was found that the level of knowledge about gestational diabetes in pregnant women in a second-level hospital is low.

The significant relationship between the level of knowledge about gestational diabetes and factors such as schooling, socioeconomic status, and nutritional status (BMI) reveals critical areas where educational interventions should be focused. These findings reinforce the need to adopt a more personalized approach to antenatal care, recognizing that knowledge depends not only on access to information, but also on the structural conditions that determine the ability to understand and apply such information.

The scientific literature supports this position, highlighting that the strengthening of information strategies, the adaptation of the approach according to the sociodemographic and clinical profile of the patients, and the promotion of continuous education from the first level of care are fundamental pillars to improve maternal-fetal outcomes, this with good interprofessional coordination and the use of validated educational tools to optimize the management of gestational diabetes

Implementing accessible, culturally relevant, and clinically validated educational materials can become a powerful tool to empower pregnant women, improve maternal-fetal prognosis, and reduce associated complications. This strategy not only has clinical implications, but also social ones, by contributing to health equity and strengthening the link between the health system and the community.

Carrying out an educational screening, through the application of a questionnaire during or prior to the prenatal consultation, either by medical personnel or nursing personnel, would help for the timely and early detection of pregnant women with risk factors and candidates for these workshops. All this in order to improve the quality of life of pregnant women and their families, as well as the reduction of maternal-fetal morbidity and mortality

Based on the results obtained, the development of health education programs for pregnant women with risk factors is proposed, optimally adapted to the level of schooling and sociocultural context, such as the creation of group workshops for pregnant women, informative capsules, increase of infographics in visible places, where topics such as gestational diabetes, hypertensive diseases, etc., all this under the charge of personnel of the medical unit (medical, nursing, nutrition, psychology personnel).

It is recommended to strengthen interprofessional coordination, between the different levels of medical care, as well as between the different specialties involved in the care of pregnant patients. In the same way, continuous training should be encouraged for all health personnel in order to improve the effective communication of risk factors and alarm data in pregnancy, thus promoting the empowerment of patients and encouraging self-care.

This study opens the door for future longitudinal studies to evaluate the impact of knowledge about gestational diabetes on clinical outcomes, as well as to explore the effect of educational interventions during preconception consultation, prenatal consultation and postpartum follow-up.

In short, this work not only provides relevant data for clinical practice, but also opens the door to future research and institutional actions aimed at improving the quality of life of pregnant women and their families. All this in coherence with the principles of family and community medicine, which promote comprehensive care, centered on the person, and based on prevention, education and continuous accompaniment.

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