



Evaluating the Stigma related to Type 2 diabetes mellitus among the population in the southwest region of Saudi Arabia: A cross-sectional study

Farrukh Sobia *, Amal Ramadan Abdelhalim and Shahazad Niwazi Qurashi

Department of Public Health, College of Nursing and Health Sciences, Jazan University, Jazan, Kingdom of Saudi Arabia.

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Abstract

This study investigated the prevalence of diabetes stigma among individuals in KSA. The DSAS-2 Scale was used to assess the stigma associated with T2DM. The scale comprises 19 items, indicative of three subscales: Treated Differently (6 items), Blame and Judgment (7 items), and Self-stigma (6 items). A total of 224 participants completed the questionnaire on the DSAS-2 Scale, among whom 71.08% had been diagnosed with diabetes within the past 10 years, while 28.92% had been diagnosed more than 10 years ago. Nearly half of the participants (48.04%) reported having well-controlled blood glucose levels, while 18.63% acknowledged their struggle to maintain their glucose levels. Regarding “blame and judgement” because of T2DM, most participants disagreed, while 21.15% were unsure. However, nearly 16% of participants agreed, and 9.88% strongly agreed with the blame and judgmental behaviour of others. The study provides valuable insights into the stigma related to T2DM among the population in the Jazan region of Saudi Arabia. By raising awareness, fostering understanding, and implementing targeted interventions, we can work towards reducing stigma and creating supportive environments for individuals with T2DM in Saudi Arabia and beyond.

Keywords: Type-2 Diabetes Mellitus Stigma; DSAS-2 Scale; Self-stigma; Blame and Judgment; Treated Differently

1. Introduction

Global estimates highlight the growing burden of diabetes, with 529 million people affected in 2021 and an age-standardised prevalence of 6.1%. The highest rates were reported in North Africa and the Middle East, as well as in Oceania, with Qatar recording the world’s highest age-specific prevalence among older adults. Projections indicate that diabetes will affect more than 1.31 billion people by 2050, with nearly half of the countries expected to exceed a 10% prevalence rate [1]. Despite being largely preventable, T2DM continues to rise due to increasing obesity and lifestyle-related factors. In 2023, only 55.8% of adults with diabetes globally were diagnosed, and while most diagnosed individuals received treatment, optimal glycaemic control was achieved by just 41.6%, with considerable regional variations. These trends underscore the urgency of developing and implementing effective prevention, early detection, and management strategies worldwide.

Compared to high-income countries (HIC), this increase disproportionately affects low- and middle-income countries and adds a burden of excess morbidity, mortality, and healthcare costs [2]. Growing evidence reveals that people with type 2 diabetes report experiencing and/or perceiving disease-specific stigma [3-5]. Some people with type 2 diabetes report that they feel judged, blamed, and shamed because of the diagnosis, feedback (either from glucose monitoring devices, blood test results, or their healthcare providers) revealing inadequate glycemic control, and diabetes-related complications associated with the performance of their daily self-care behaviours [4]. As a result, diabetes-related stigma leads to concealment attempts such as delaying insulin injection therapy and refusing to disclose their disease to others.

* Corresponding author: Farrukh Sobia; ORCID ID: 0000-0002-7531-8748

One study was conducted among adults diagnosed with type 2 diabetes, primarily overweight or obese individuals, recruited from the United States, who completed self-reported surveys assessing experiences of diabetes-related and weight-related stigma. It was found that they commonly experience both diabetes stigma and weight stigma, often simultaneously, from healthcare providers, family, and society. These stigmas were associated with poorer psychological well-being, including higher distress and lower self-care engagement, highlighting stigma as a barrier to effective diabetes management [6].

A large proportion of the population in Arab countries suffers from Diabetes. In addition to a genetic predisposition in its population, evidence suggests that obesity, physical inactivity, urbanization, and poor nutritional habits have contributed to the high prevalence of diabetes and prediabetes in the region. Despite advances in diabetes management and healthcare services, Type 2 Diabetes remains a significant public health concern in the Southwest region of Saudi Arabia. However, alongside the clinical challenges, individuals living with Type 2 Diabetes often face pervasive stigma, which can manifest through various social, cultural, and psychological barriers. This stigma not only undermines the well-being and quality of life of affected individuals but also poses substantial obstacles to effective disease management. Yet there is a notable lack of comprehensive research addressing the nature, extent, and implications of Type 2 Diabetes stigma within the specific socio-cultural context of the Southwest region. Therefore, there is an urgent need for a systematic evaluation of the stigma related to Type 2 Diabetes in this population.

Stigma can significantly impact the quality of life of individuals living with Type 2 Diabetes; hence, identifying and addressing stigma can contribute to enhancing the effectiveness of diabetes management strategies and to improving the psychosocial well-being of affected individuals, promoting resilience and empowerment in managing their condition. Moreover, findings of this study can provide valuable insights for policymakers and healthcare providers to implement targeted interventions and reforms. This may include initiatives to address discriminatory practices, improve access to diabetes care services, and integrate stigma reduction efforts into broader public health campaigns.

By understanding how diabetes-related stigma affects different patient populations through these factors and recognizing its varying impacts, we can gain a deeper understanding of this issue. Moreover, broad strategies coupled with targeted interventions at the local, regional, and national levels are needed to address the issue of this social stigma about diabetes. Hence, the present study was designed to assess the prevalence of stigma associated with Type-2 Diabetes among individuals residing in the Southwest region of Saudi Arabia.

2. Materials and Methods

2.1. Study Design

This study employed a descriptive cross-sectional design and was conducted in the Jizan region of the Kingdom of Saudi Arabia.

2.2. Study Population

The study population comprised citizens and residents of the southern region of Saudi Arabia. All participants provided informed written consent before participation. Participation was voluntary, and confidentiality of the collected data was strictly maintained.

- Inclusion criteria were citizens and residents of the southern region of Saudi Arabia who consented to participate in the study.
- Exclusion criteria included individuals who declined to provide informed consent and those who submitted incomplete questionnaire responses.

2.3. Sampling Technique and Sampling Size

A non-probability convenience sampling technique was employed. Participants were recruited through social media platforms, where the survey questionnaire was distributed electronically.

The final sample size was calculated as 384 participants. Sample size estimation was performed using the standard formula for proportion estimates with a 95% confidence level and a margin of error of 5%:

$$n = \frac{Z^2 \cdot p \cdot q}{E^2}$$

where Z represents the Z-score for a 95% confidence level, p is the estimated prevalence, $q = 1 - p$, and E is the margin of error.

Based on this calculation, the minimum required sample size was 384 participants.

Study instrument: Data were collected using a structured questionnaire developed based on an extensive review of the existing literature. The questionnaire was initially prepared in English and subsequently translated into Arabic.

The questionnaire consisted of three sections

- Section 1: Baseline socio-demographic characteristics of the respondents
- Section 2: Healthcare access and utilisation related to diabetes management
- Section 3: Assessment of perceived stigma related to Type 2 diabetes using the Diabetes Stigma Assessment Scale-2 (DSAS-2) (7).

2.4. Study Variables

Independent variables included Socio-demographic factors (age, gender, ethnicity, education level, employment status), Healthcare access and utilisation (diabetes management therapy, self-reported glucose control), Disease-related factors (duration of diagnosis, HbA1c level, mental health status)

The dependent variable was perceived stigma related to Type 2 diabetes.

Statistical Analysis: The collected data were cleaned and organised using Microsoft Excel and subsequently analysed using the Statistical Package for the Social Sciences (SPSS). A p-value of <0.05 was considered statistically significant.

3. Results

3.1. Socio-demographic Characteristics

A total of 204 participants responded with a complete questionnaire. Written informed consent was obtained from all participants in accordance with ethical guidelines.

Most of the participants were aged between 40 and 60 years (86.76%), were female (78.43%), ethnically identified themselves as Saudis (95.59%), were non-employed (56.37%), and held bachelor's degrees (61.27%). The details of the sociodemographic characteristics of the participants are tabulated below in Table 1.

Table 1 Socio-demographic characteristics of the study population

	Frequency	Percentage	95% CI
Age			
< 40 years	7	3.4%	1.5% - 7.2%
40-60 Years	177	86.8%	81.2% - 90.9%
>60 years	20	9.8%	6.2% - 14.9%
Gender			
Male	44	21.6%	16.3% - 28.0%
Female	160	78.4%	72.0% - 83.7%
Ethnicity			
Saudi	195	95.6%	91.5% - 97.8%
Non-Saudi	9	4.4%	2.2% - 8.5%
Educational Level			
High school degree	42	20.6%	15.4% - 26.9%

Diploma	9	4.4%	2.2% - 8.5%
Bachelors	125	61.3%	54.2% - 67.9%
Others	28	13.7%	9.5% - 19.4%
Employment			
Not employed	115	56.4%	49.3% - 63.2%
Employed	47	23.0%	17.6% - 29.5%
Others	42	20.6%	15.4% - 26.9%

3.2 Healthcare access and use: In the present study, 71.08% of participants were diagnosed with diabetes within the past 10 years, while 28.92% had been diagnosed more than 10 years prior (Details in Table 2). Many of the participants were managing their diabetes with insulin. Only 6.4% were using MDI. Nearly half of the participants (48.04%) reported having well-controlled blood glucose levels, while 18.63% acknowledged struggling to maintain their glucose levels.

Table 2 Healthcare access and use by the study participants

Healthcare Access		
		N (Percentage)
Therapy	Insulin	96 (47.07%)
	No insulin	94 (46.08%)
	Pump/ MDPI	14 (6.86%)
Self-reported blood glucose control	Well controlled	98 (48.04%)
	Neutral	68 (33.33%)
	Not well controlled	38 (18.63%)
Diabetes Duration	Less than 10 years	145 (71.08%)
	More than 10 years	59 (28.92%)

3.3 Prevalence of diabetes-related Stigma as per DSAS-2 Scale:

Treated Differently: Overall, our study participants disagreed with the items on the scale, indicating that they were treated differently due to T2DM. Detailed results are shown in Fig 1a.

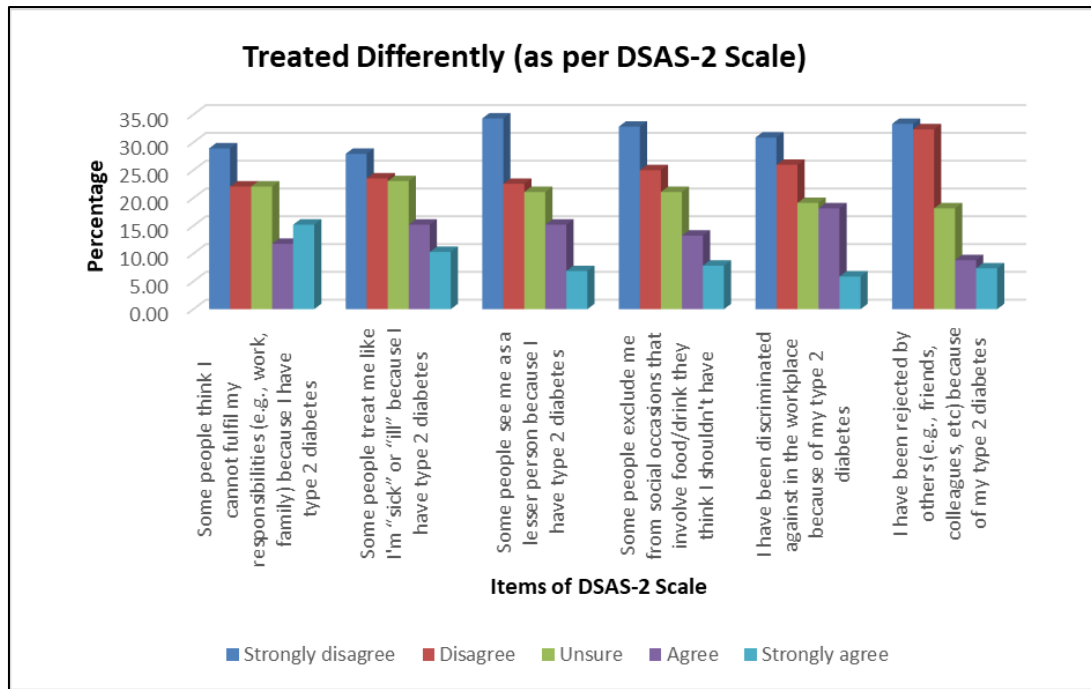


Figure 1a Detailed analysis of Diabetes-related stigma for “treated differently”

Blame and Judgement: Regarding “blame and judgement” because of T2DM, most participants disagreed, while 21.15% were unsure about it. However, nearly 16% of participants agreed, and 9.88% strongly agreed with the blame and judgmental behaviour of others towards people having diabetes mellitus. Results are shown in Fig 1b.

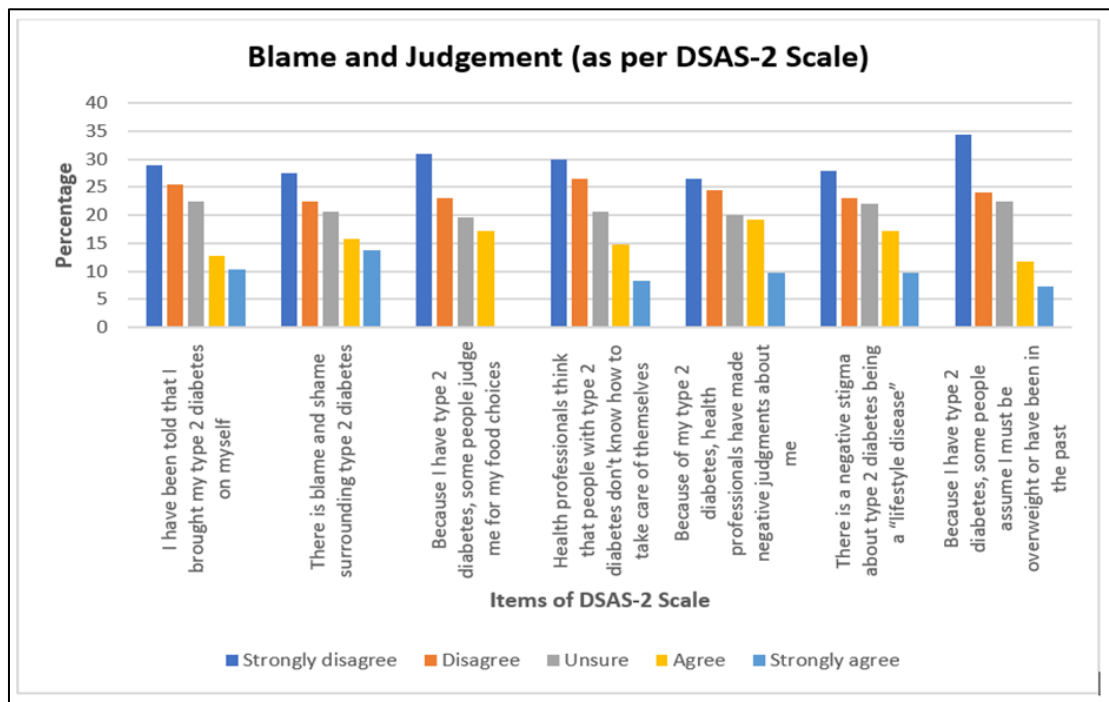


Figure 1b Detailed analysis of Diabetes-related stigma for “Blame and Judgement”

Self-stigma associated with T2DM: A significant portion of the participants expressed disagreement regarding self-stigma associated with T2DM, while 23.30% agreed (either strongly agreeing or agreeing) in this study. Detailed results are in Fig 1c.

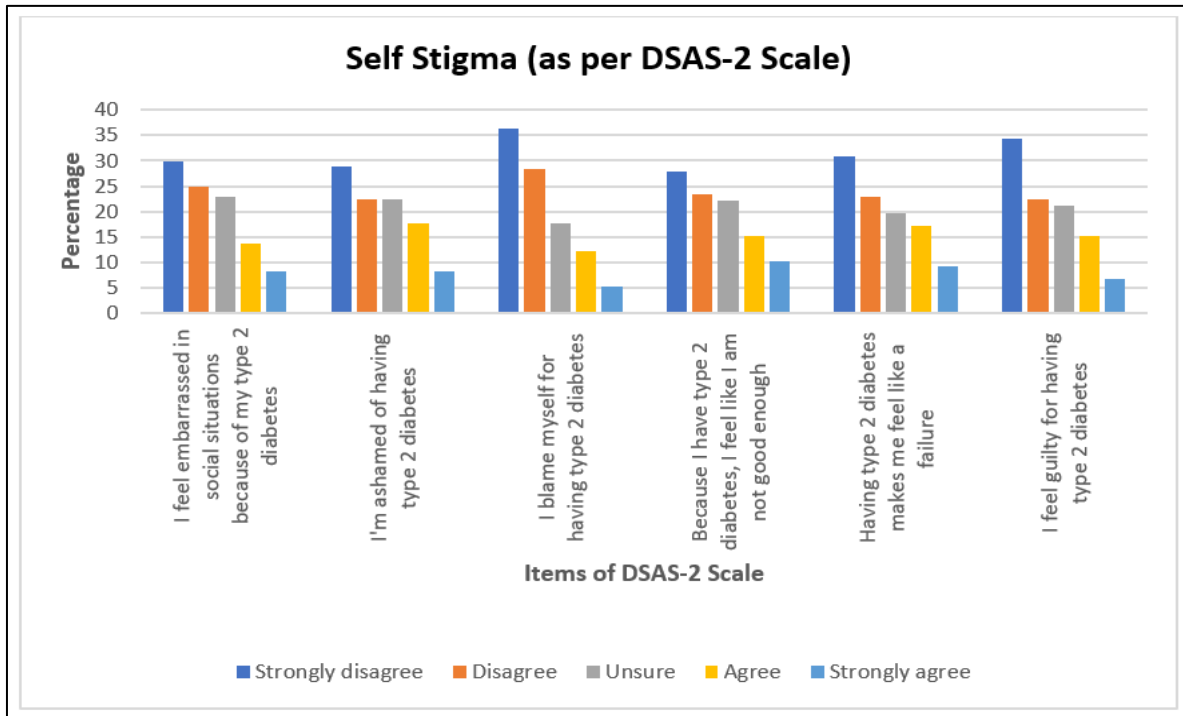


Figure 1c Detailed analysis of Diabetes-related self-stigma

The inclusive analysis of diabetes-related stigma, as measured by the DSAS-2 scale, is presented in Table 3.

Table 3 Inclusive analysis of diabetes-related stigma

Has type 2 diabetes affected emotional life, such as feelings of guilt, shame, blame, embarrassment, and isolation?	Frequency	Percentage	95% CI
Yes	61	29.9%	23.8% - 36.8%
No	143	70.1%	63.2% - 76.2%
Do you suffer from depression?			
Yes	51	25.0%	19.3% - 31.6%
No	153	75.0%	68.4% - 80.7%
Has this affected your social life in terms of opening up about your diabetes, finding a supportive community, having a full social life, and succeeding at work?			
Yes	69	33.8%	27.5% - 40.8%
No	135	66.2%	59.2% - 72.5%

Are you committed to your diabetes management and consider it a good and successful option?			
Yes	136	66.7%	59.7% - 73.0%
No	68	33.3%	27.0% - 40.3%
Some people think I cannot fulfil my responsibilities (e.g., work, family) because I have type 2 diabetes			
Strongly Agree	31	15.2%	10.7% - 21.0%
Agree	24	11.8%	7.8% - 17.2%
Unsure	45	22.1%	16.7% - 28.5%
Disagree	59	28.9%	22.9% - 35.7%
Strongly Disagree	45	22.1%	16.7% - 28.5%
Some people treat me like I'm "sick" or "ill" because I have type 2 diabetes			
Strongly Agree	21	10.3%	6.6% - 15.5%
Agree	48	23.5%	18.0% - 30.1%
Unsure	47	23.0%	17.6% - 29.5%
Disagree	57	27.9%	22.0% - 34.7%
Strongly Disagree	31	15.2%	10.7% - 21.0%
Some people see me as a lesser person because I have type 2 diabetes			
Strongly Agree	14	6.9%	3.9% - 11.5%
Agree	31	15.2%	10.7% - 21.0%
Unsure	43	21.1%	15.8% - 27.4%
Disagree	70	34.3%	27.9% - 41.3%
Strongly Disagree	46	22.5%	17.1% - 29.0%
Some people exclude me from social occasions that involve food/drink they think I shouldn't have			
Strongly Agree	16	7.8%	4.7% - 12.6%
Agree	27	13.2%	9.1% - 18.8%

Unsure	43	21.1%	15.8% - 27.4%
Disagree	67	32.8%	26.5% - 39.8%
Strongly Disagree	51	25.0%	19.3% - 31.6%
I have been discriminated against in the workplace because of my type 2 diabetes			
Strongly Agree	12	5.9%	3.2% - 10.3%
Agree	37	18.1%	13.2% - 24.3%
Unsure	53	26.0%	20.2% - 32.7%
Disagree	63	30.9%	24.7% - 37.8%
Strongly Disagree	39	19.1%	14.1% - 25.3%
I have been rejected by others (e.g., friends, colleagues, etc) because of my type 2 diabetes			
Strongly Agree	15	7.4%	4.3% - 12.1%
Agree	18	8.8%	5.5% - 13.8%
Unsure	37	18.1%	13.2% - 24.3%
Disagree	66	32.4%	26.1% - 39.3%
Strongly Disagree	68	33.3%	27.0% - 40.3%
I have been told that I brought my type 2 diabetes on myself	Frequency	Percentage	95% CI
Strongly Agree	23	11.3%	7.4% - 16.6%
Agree	37	18.1%	13.2% - 24.3%
Unsure	47	23.0%	17.6% - 29.5%
Disagree	56	27.5%	21.6% - 34.2%
Strongly Disagree	41	20.1%	15.0% - 26.4%
There is blame and shame surrounding type 2 diabetes			
Strongly Agree	21	10.3%	6.6% - 15.5%
Agree	26	12.7%	8.6% - 18.3%

Unsure	52	25.5%	19.8% - 32.1%
Disagree	59	28.9%	22.9% - 35.7%
Strongly Disagree	46	22.5%	17.1% - 29.0%
Because I have type 2 diabetes, some people judge me for my food choices.			
Strongly Agree	28	13.7%	9.5% - 19.4%
Agree	56	27.5%	21.6% - 34.2%
Unsure	46	22.5%	17.1% - 29.0%
Disagree	42	20.6%	15.4% - 26.9%
Strongly Disagree	32	15.7%	11.1% - 21.6%
Health professionals think that people with type 2 diabetes don't know how to take care of themselves.	Frequency	Percentage	95% CI
Strongly Agree	19	9.3%	5.8% - 14.4%
Agree	40	19.6%	14.5% - 25.9%
Unsure	63	30.9%	24.7% - 37.8%
Disagree	47	23.0%	17.6% - 29.5%
Strongly Disagree	35	17.2%	12.4% - 23.2%
Because of my type 2 diabetes, health professionals have made negative judgments about me.			
Strongly Agree	17	8.3%	5.1% - 13.2%
Agree	30	14.7%	10.3% - 20.5%
Unsure	54	26.5%	20.7% - 33.2%
Disagree	61	29.9%	23.8% - 36.8%
Strongly Disagree	42	20.6%	15.4% - 26.9%
There is a negative stigma about type 2 diabetes being a "lifestyle disease"			
Strongly Agree	20	9.8%	6.2% - 14.9%
Agree	39	19.1%	14.1% - 25.3%

Unsure	54	26.5%	20.7% - 33.2%
Disagree	50	24.5%	18.9% - 31.1%
Strongly Disagree	41	20.1%	15.0% - 26.4%
Because I have type 2 diabetes, some people assume I must be overweight or have been in the past.			
Strongly Agree	20	9.8%	6.2% - 14.9%
Agree	57	27.9%	22.0% - 34.7%
Unsure	45	22.1%	16.7% - 28.5%
Disagree	47	23.0%	17.6% - 29.5%
Strongly Disagree	35	17.2%	12.4% - 23.2%
I feel embarrassed in social situations because of my type 2 diabetes			
Strongly Agree	15	7.4%	4.3% - 12.1%
Agree	24	11.8%	7.8% - 17.2%
Unsure	46	22.5%	17.1% - 29.0%
Disagree	70	34.3%	27.9% - 41.3%
Strongly Disagree	49	24.0%	18.5% - 30.6%
I'm ashamed of having type 2 diabetes			
Strongly Agree	18	8.8%	5.5% - 13.8%
Agree	23	11.3%	7.4% - 16.6%
Unsure	41	20.1%	15.0% - 26.4%
Disagree	72	35.3%	28.8% - 42.3%
Strongly Disagree	50	24.5%	18.9% - 31.1%
I blame myself for having type 2 diabetes			
Strongly Agree	17	8.3%	5.1% - 13.2%
Agree	28	13.7%	9.5% - 19.4%

Unsure	47	23.0%	17.6% - 29.5%
Disagree	61	29.9%	23.8% - 36.8%
Strongly Disagree	51	25.0%	19.3% - 31.6%
Because I have type 2 diabetes, I feel like I am not good enough			
Strongly Agree	17	8.3%	5.1% - 13.2%
Agree	36	17.6%	12.8% - 23.7%
Unsure	46	22.5%	17.1% - 29.0%
Disagree	59	28.9%	22.9% - 35.7%
Strongly Disagree	46	22.5%	17.1% - 29.0%
Having type 2 diabetes makes me feel like a failure			
Strongly Agree	11	5.4%	2.9% - 9.7%
Agree	25	12.3%	8.2% - 17.7%
Unsure	36	17.6%	12.8% - 23.7%
Disagree	74	36.3%	29.8% - 43.3%
Strongly Disagree	58	28.4%	22.5% - 35.2%
I feel guilty for having type 2 diabetes			
Strongly Agree	17	8.3%	5.1% - 13.2%
Agree	30	14.7%	10.3% - 20.5%
Unsure	38	18.6%	13.7% - 24.8%
Disagree	63	30.9%	24.7% - 37.8%
Strongly Disagree	56	27.5%	21.6% - 34.2%

Association between gender and various parameters used in the study: The Age, Ethnicity, Education level, Employment, HbA1C, and Diabetes duration were significantly associated ($p < 0.05$) with the variable 'Gender'. The males showed higher proportions of elevated HbA1c and longer diabetes duration. However, no significant gender differences were found across therapy type, self-reported glucose control, depression, emotional or social impacts, or stigma-related perceptions ($p > 0.05$). Overall, gender disparities were mainly limited to demographic and clinical characteristics rather than psychosocial factors. Details are shown in Table 4.

Table 4 Summary Table for the Association between “Gender” and Parameters

Parameters	Gender		p value
	Male (n = 44)	Female (n = 160)	
Age***			<0.001 ¹
Child	4 (9.1%)	3 (1.9%)	
Adult	30 (68.2%)	147 (91.9%)	
Old people	10 (22.7%)	10 (6.2%)	
Ethnicity***			0.024 ¹
Saudi	39 (88.6%)	156 (97.5%)	
Non-Saudi	5 (11.4%)	4 (2.5%)	
Education level***			0.004 ²
High school degree	15 (34.1%)	27 (16.9%)	
Diploma	4 (9.1%)	5 (3.1%)	
Bachelors	17 (38.6%)	108 (67.5%)	
Others	8 (18.2%)	20 (12.5%)	
Employment***			<0.001 ²
Not employed	13 (29.5%)	102 (63.7%)	
Employed	23 (52.3%)	24 (15.0%)	
Others	8 (18.2%)	34 (21.2%)	
HbA1C***			0.005 ²
<7	19 (43.2%)	106 (66.2%)	
>7	25 (56.8%)	54 (33.8%)	
Therapy			0.581 ²
Insulin	19 (43.2%)	77 (48.1%)	
No Insulin	23 (52.3%)	71 (44.4%)	
Pump/MDI	2 (4.5%)	12 (7.5%)	
Self-Reported Blood Glucose Control			0.116 ¹
Well Controlled	18 (40.9%)	80 (50.0%)	
Neutral	12 (27.3%)	54 (33.8%)	
Not Well Controlled	13 (29.5%)	25 (15.6%)	
Unsure	1 (2.3%)	1 (0.6%)	
Diabetes duration***			0.048 ²
Less than 10 years	26 (59.1%)	119 (74.4%)	
More than 10 years	18 (40.9%)	41 (25.6%)	
Do you suffer from depression (Yes)	11 (25.0%)	40 (25.0%)	1.000 ²

Has type 2 diabetes affected emotional life, such as feelings of guilt, shame, blame, embarrassment, and isolation? (Yes)	13 (29.5%)	48 (30.0%)	0.953 ²
Has this affected your social life in terms of opening up about your diabetes, finding a supportive community, having a full social life, and succeeding at work? (Yes)	16 (36.4%)	53 (33.1%)	0.688 ²
Are you committed to your diabetes management and consider it a good and successful option? (Yes)	24 (54.5%)	112 (70.0%)	0.054 ²
Some people think I cannot fulfil my responsibilities (e.g., work, family) because I have type 2 diabetes			0.258 ²
Strongly Agree	4 (9.1%)	27 (16.9%)	
Agree	9 (20.5%)	15 (9.4%)	
Unsure	10 (22.7%)	35 (21.9%)	
Disagree	11 (25.0%)	48 (30.0%)	
Strongly Disagree	10 (22.7%)	35 (21.9%)	
Some people treat me like I'm "sick" or "ill" because I have type 2 diabetes			0.744 ²
Strongly Agree	5 (11.4%)	16 (10.0%)	
Agree	7 (15.9%)	41 (25.6%)	
Unsure	12 (27.3%)	35 (21.9%)	
Disagree	13 (29.5%)	44 (27.5%)	
Strongly Disagree	7 (15.9%)	24 (15.0%)	
Some people see me as a lesser person because I have type 2 diabetes			0.950 ²
Strongly Agree	2 (4.5%)	12 (7.5%)	
Agree	7 (15.9%)	24 (15.0%)	
Unsure	10 (22.7%)	33 (20.6%)	
Disagree	16 (36.4%)	54 (33.8%)	
Strongly Disagree	9 (20.5%)	37 (23.1%)	
Some people exclude me from social occasions that involve food/drink they think I shouldn't have			0.978 ²
Strongly Agree	3 (6.8%)	13 (8.1%)	
Agree	6 (13.6%)	21 (13.1%)	
Unsure	8 (18.2%)	35 (21.9%)	
Disagree	15 (34.1%)	52 (32.5%)	
Strongly Disagree	12 (27.3%)	39 (24.4%)	
I have been discriminated against in the workplace because of my type 2 diabetes			0.422 ²
Strongly Agree	3 (6.8%)	9 (5.6%)	

Agree	5 (11.4%)	32 (20.0%)	
Unsure	14 (31.8%)	39 (24.4%)	
Disagree	11 (25.0%)	52 (32.5%)	
Strongly Disagree	11 (25.0%)	28 (17.5%)	
I have been rejected by others (e.g., friends, colleagues, etc) because of my type 2 diabetes			0.808 ²
Strongly Agree	3 (6.8%)	12 (7.5%)	
Agree	4 (9.1%)	14 (8.8%)	
Unsure	9 (20.5%)	28 (17.5%)	
Disagree	11 (25.0%)	55 (34.4%)	
Strongly Disagree	17 (38.6%)	51 (31.9%)	
I have been told that I brought my type 2 diabetes on myself			0.667 ²
Strongly Agree	4 (9.1%)	19 (11.9%)	
Agree	7 (15.9%)	30 (18.8%)	
Unsure	11 (25.0%)	36 (22.5%)	
Disagree	10 (22.7%)	46 (28.7%)	
Strongly Disagree	12 (27.3%)	29 (18.1%)	
There is blame and shame surrounding type 2 diabetes			0.460 ²
Strongly Agree	5 (11.4%)	16 (10.0%)	
Agree	6 (13.6%)	20 (12.5%)	
Unsure	12 (27.3%)	40 (25.0%)	
Disagree	8 (18.2%)	51 (31.9%)	
Strongly Disagree	13 (29.5%)	33 (20.6%)	
Because I have type 2 diabetes, some people judge me for my food choices.			0.483 ²
Strongly Agree	5 (11.4%)	23 (14.4%)	
Agree	16 (36.4%)	40 (25.0%)	
Unsure	11 (25.0%)	35 (21.9%)	
Disagree	6 (13.6%)	36 (22.5%)	
Strongly Disagree	6 (13.6%)	26 (16.2%)	
Health professionals think that people with type 2 diabetes don't know how to take care of themselves.			0.560 ²
Strongly Agree	4 (9.1%)	15 (9.4%)	
Agree	12 (27.3%)	28 (17.5%)	
Unsure	14 (31.8%)	49 (30.6%)	
Disagree	7 (15.9%)	40 (25.0%)	
Strongly Disagree	7 (15.9%)	28 (17.5%)	

Because of my type 2 diabetes, health professionals have made negative judgments about me.			0.900 ²
Strongly Agree	5 (11.4%)	12 (7.5%)	
Agree	5 (11.4%)	25 (15.6%)	
Unsure	12 (27.3%)	42 (26.2%)	
Disagree	13 (29.5%)	48 (30.0%)	
Strongly Disagree	9 (20.5%)	33 (20.6%)	
There is a negative stigma about type 2 diabetes being a “lifestyle disease”			0.242 ²
Strongly Agree	5 (11.4%)	15 (9.4%)	
Agree	10 (22.7%)	29 (18.1%)	
Unsure	9 (20.5%)	45 (28.1%)	
Disagree	7 (15.9%)	43 (26.9%)	
Strongly Disagree	13 (29.5%)	28 (17.5%)	
Because I have type 2 diabetes, some people assume I must be overweight or have been in the past.			0.840 ²
Strongly Agree	5 (11.4%)	15 (9.4%)	
Agree	10 (22.7%)	47 (29.4%)	
Unsure	11 (25.0%)	34 (21.2%)	
Disagree	9 (20.5%)	38 (23.8%)	
Strongly Disagree	9 (20.5%)	26 (16.2%)	
I feel embarrassed in social situations because of my type 2 diabetes			0.587 ²
Strongly Agree	3 (6.8%)	12 (7.5%)	
Agree	3 (6.8%)	21 (13.1%)	
Unsure	12 (27.3%)	34 (21.2%)	
Disagree	13 (29.5%)	57 (35.6%)	
Strongly Disagree	13 (29.5%)	36 (22.5%)	
I'm ashamed of having type 2 diabetes			0.692 ²
Strongly Agree	5 (11.4%)	13 (8.1%)	
Agree	3 (6.8%)	20 (12.5%)	
Unsure	7 (15.9%)	34 (21.2%)	
Disagree	17 (38.6%)	55 (34.4%)	
Strongly Disagree	12 (27.3%)	38 (23.8%)	
I blame myself for having type 2 diabetes			0.986 ²
Strongly Agree	3 (6.8%)	14 (8.8%)	
Agree	7 (15.9%)	21 (13.1%)	
Unsure	10 (22.7%)	37 (23.1%)	

Disagree	13 (29.5%)	48 (30.0%)	
Strongly Disagree	11 (25.0%)	40 (25.0%)	
Because I have type 2 diabetes, I feel like I am not good enough			0.091 ²
Strongly Agree	4 (9.1%)	13 (8.1%)	
Agree	7 (15.9%)	29 (18.1%)	
Unsure	14 (31.8%)	32 (20.0%)	
Disagree	6 (13.6%)	53 (33.1%)	
Strongly Disagree	13 (29.5%)	33 (20.6%)	
Having type 2 diabetes makes me feel like a failure			0.868 ²
Strongly Agree	2 (4.5%)	9 (5.6%)	
Agree	4 (9.1%)	21 (13.1%)	
Unsure	7 (15.9%)	29 (18.1%)	
Disagree	16 (36.4%)	58 (36.2%)	
Strongly Disagree	15 (34.1%)	43 (26.9%)	
I feel guilty for having type 2 diabetes			0.521 ²
Strongly Agree	6 (13.6%)	11 (6.9%)	
Agree	4 (9.1%)	26 (16.2%)	
Unsure	8 (18.2%)	30 (18.8%)	
Disagree	13 (29.5%)	50 (31.2%)	
Strongly Disagree	13 (29.5%)	43 (26.9%)	

***Significant at p<0.05, 1: Fisher's Exact Test, 2: Chi-Squared Test

Association between HbA1c levels and gender: A significant association was observed between gender and HbA1c levels. Males had a higher odds ratio and relative risk of poor glycaemic control (HbA1c >7), with an OR of 2.58 and RR of 1.68, indicating they were more likely to have elevated HbA1c compared to females. Conversely, females demonstrated better glycaemic control (HbA1c <7), with an OR of 2.58 and RR of 1.53 (Details in Table 5). Overall, females were more likely to maintain controlled HbA1c, while males showed a greater likelihood of uncontrolled levels.

Table 5 Association Between 'Gender' and 'HbA1C levels

Predictor/Risk Factor	Outcome	Odds Ratio (95% CI)	Relative Risk (95% CI)
Gender: Male	HbA1C: <7	0.39 (0.2-0.76)	0.65 (0.44-0.89)
Gender: Male	HbA1C: >7	2.58 (1.31-5.1)	1.68 (1.18-2.32)
Gender: Female	HbA1C: <7	2.58 (1.31-5.1)	1.53 (1.12-2.26)
Gender: Female	HbA1C: >7	0.39 (0.2-0.76)	0.59 (0.43-0.85)

Association Between 'Gender' and 'Therapy': There was no significant association between gender and the type of diabetes therapy used ($\chi^2 = 1.085$, $p = 0.581$). The distribution of insulin, non-insulin, and pump/MDI therapies was comparable between males and females. Although females had a slightly higher proportion on insulin therapy, and males a slightly higher proportion on non-insulin therapy, these differences were not statistically meaningful (Details

in Table 6). Overall, therapy choice appeared independent of gender. Strength of association between the two variables (Cramer's V) = 0.07 indicates little/no Association.

Table 6 Association Between 'Gender' and 'Therapy'

Therapy	Gender			Chi-Squared Test	
	Male	Female	Total	χ^2	P Value
Insulin	19 (43.2%)	77 (48.1%)	96 (47.1%)	1.085	0.581
No Insulin	23 (52.3%)	71 (44.4%)	94 (46.1%)		
Pump/MDI	2 (4.5%)	12 (7.5%)	14 (6.9%)		
Total	44 (100.0%)	160 (100.0%)	204 (100.0%)		

There was no significant association between gender and the emotional impact of type 2 diabetes ($\chi^2 = 0.003$, $p=0.953$). Nearly equal proportions of males (29.5%) and females (30.0%) reported experiencing emotional effects such as guilt, shame, embarrassment, or isolation. This indicates that emotional burdens related to diabetes are similar across genders (Details in Table 7). Overall, gender did not influence whether individuals reported emotional distress from their condition.

Table 7 Association Between 'Gender' and 'Type-2 diabetes affected emotional life'

Has type 2 diabetes affected emotional life, such as feelings of guilt, shame, blame, embarrassment, and isolation?	Gender			Chi-Squared Test	
	Male	Female	Total	χ^2	P Value
Yes	13 (29.5%)	48 (30.0%)	61 (29.9%)	0.003	0.953
No	31 (70.5%)	112 (70.0%)	143 (70.1%)		
Total	44 (100.0%)	160 (100.0%)	204 (100.0%)		

4. Discussion

In 2021, there were 529 million (95% uncertainty interval [UI] 500–564) people living with diabetes worldwide, and the global age-standardized total diabetes prevalence was 6.1% (5.8–6.5). At the super-region level, the highest age-standardized rates were observed in North Africa and the Middle East (9.3% [8.7–9.9]) and, at the regional level, in Oceania (12.3% [11.5–13.0]). Nationally, Qatar had the world's highest age-specific prevalence of diabetes, at 76.1% (73.1–79.5) in individuals aged 75–79 years. Total diabetes prevalence, especially among older adults, primarily reflects type 2 diabetes, which in 2021 accounted for 96.0% (95.1–96.8) of diabetes cases and 95.4% (94.9–95.9) of diabetes DALYs worldwide. Diabetes remains a substantial public health issue. All evidence indicates that diabetes prevalence is increasing worldwide, primarily due to a rise in obesity caused by multiple factors. Preventing and controlling type 2 diabetes remains an ongoing challenge.

In 2023, an estimated 55.8% (95% UI 49.3–62.3) of people with diabetes aged 15 years and older were diagnosed with diabetes globally. The proportion of people with diagnosed diabetes who were on treatment was 91.4% (88.0–94.2), and the proportion of people on diabetes treatment with optimal glycaemic concentrations was 41.6% (35.7–48.5). Substantial regional differences were observed, with the highest rates of diagnosis in high-income North America, the highest rates of treatment among those with diagnosed diabetes in high-income Asia Pacific, and the highest rates of optimal glycaemic concentrations among those receiving treatment for diabetes in southern Latin America [1].

Bahijri et al. (2016) reported significant rates of diabetes in Jeddah, while Aldossari *et al.* (2018) highlighted associated risk factors among Saudi males [8, 9]. Alanazi *et al.* (2017) observed that prevalence varied by age and sex in Northern Saudi Arabia, and Al Hanawi et al. (2020) emphasised the role of socioeconomic inequalities in shaping diabetes prevalence nationwide [10, 11].

The present study demonstrates that stigma associated with Type 2 Diabetes Mellitus (T2DM) remains a significant psychosocial burden among adults in the southwest region of Saudi Arabia. The findings are consistent with a growing global body of evidence acknowledging diabetes stigma as a complex, multidimensional construct that includes public stigma, enacted stigma, self-stigma, and anticipated stigma [12, 13]. These dimensions collectively influence the emotional well-being, social functioning, and self-management practices of individuals living with diabetes.

International research consistently shows that stigma contributes to feelings of guilt, shame, blame, and social isolation [14, 15]. Similar patterns were observed in our study, where a substantial minority of participants reported emotional consequences such as guilt and embarrassment, although these differed only slightly by gender. This aligns with recent meta-analyses showing that diabetes stigma is strongly associated with poorer psychological outcomes, including depressive symptoms, anxiety, reduced self-esteem, and impaired quality of life [15, 16].

A notable finding in this study was the tendency of some participants to conceal their diagnosis or avoid glucose monitoring and insulin administration in public or workplace settings. Such concealment behaviours have been well documented in earlier studies, where individuals report avoiding public self-care due to fear of being judged as irresponsible, weak, or personally to blame for their disease [12, 14]. Avoidance of public glucose checks or insulin injections may lead to suboptimal glycaemic control, reinforcing the cycle wherein stigma indirectly worsens clinical outcomes [13].

Studies from the Middle East indicate that diabetes stigma is influenced by sociocultural expectations, including concerns related to social reputation and gender norms [17]. Our observation that younger individuals expressed greater stigma aligns with regional research suggesting that young adults may fear negative judgments affecting their future. Additionally, individuals with limited knowledge about diabetes reported higher levels of self-blame, consistent with literature showing that diabetes literacy mitigates stigma [17].

Moreover, recent international research has highlighted stigma originating within healthcare settings. Health professionals may unintentionally convey stigmatising messages through biased assumptions about non-adherence, weight, or lifestyle behaviours. Negative clinical interactions reduce patients' trust and willingness to discuss challenges, creating barriers to effective disease management. In our study, a subset of participants expressed hesitation about disclosing their diagnosis to employers or certain healthcare providers, reflecting a broader issue reported in both high-income and low-income settings [18]. These findings emphasise the need for non-stigmatising communication training, including person-centered language and culturally sensitive counselling approaches.

Stigma is increasingly recognised as both a psychosocial stressor and a social determinant of health [14]. Self-stigma contributes to behavioural disengagement, reduced motivation, emotional exhaustion, and avoidance of health services. Enacted stigma may limit access to social support, reduce opportunities for exercise and self-care, and increase exposure to chronic stress, all of which are mechanisms shown to impair glycaemic control and chronic disease outcomes [15, 16]. While evidence linking stigma directly to physiological outcomes, such as HbA1c, is mixed, an emerging body of research suggests that stigma-related psychological distress can indirectly influence glycaemic outcomes through health behaviours [13, 16].

The findings of this study highlight several opportunities for interventions, such as Public Health Education Campaigns, where community-wide interventions aimed at correcting misconceptions, highlighting the biological basis of diabetes, and reducing moral judgment have been shown to reduce stigma [14]. The structured diabetes education programs improve coping ability, reduce internalized stigma, and support self-management [16]. Besides, evidence indicates that stigma-reduction training for healthcare providers could be an effective intervention, where using person-first language, addressing weight bias, and practicing empathetic communication improves patient engagement and satisfaction [18]. In addition, policies ensuring privacy for glucose checks and insulin administration can reduce stigma and associated care avoidance. This study adds to the limited regional evidence on diabetes stigma in Saudi Arabia, particularly in the southwest region. However, several limitations must be acknowledged. Our sample was drawn from a specific geographic region, and findings may not be generalizable to other populations within Saudi Arabia or beyond. Future research could explore variations in stigma across different regions and cultural groups, as well as evaluate the effectiveness of stigma reduction interventions tailored to the Saudi context. Moreover, the cross-sectional design limits causal interpretation, and self-reporting may introduce social desirability bias. Hence, future research should prioritize

longitudinal designs to explore causal pathways between stigma and glycaemic outcomes, whereas qualitative studies should be conducted to understand cultural drivers of stigma in depth.

5. Conclusion

Consistent with findings from recent global research (2019–2024), this study demonstrates that T2DM stigma is prevalent and impactful on emotional well-being and self-management; addressing stigma should be a public health priority. Overall, the study holds significant implications for healthcare delivery, public health policy, and societal attitudes towards Type 2 Diabetes in the Southwest region of Saudi Arabia, with the potential to drive positive change and improve the lives of individuals affected by the condition. Culturally grounded education strategies, healthcare providers' training, workplace support, and psychosocial interventions are essential to reducing the burden of stigma and improving the quality of life for individuals living with T2DM.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The study was conducted in accordance with the Declaration of Helsinki and approved by the Local Committee for Research Ethics of Jazan University (HAPO-10-Z-001), with protocol code REC-47/04/1599 and a date of approval of 24 September 2025.

Author Contributions

Farrukh Sobia: Conceptualization, Funding Acquisition, Supervision, Project Administration, Methodology, Original Draft Preparation.

Amal Ramadan; Data Curation, Formal Analysis, Review & Editing of original draft.

Shahazad Qurashi; Investigation, Data Curation, Formal analysis, Review & Editing of the original draft.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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