Original Article
DOI: https://doi.org/10.70749/ijbr.v3i6.1853

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Factors Responsible for Refusal of Insulin Administration in Diabetic Patients

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ARTICLE INFO

Keywords: Insulin Refusal, Diabetes Mellitus, Psychological Barriers, Social Stigma, Treatment Adherence.

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Declaration
Authors' Contribution
All authors equally contributed to the study and approved the final manuscript

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 03-03-2025 Revised: 21-05-2025
Accepted: 07-06-2025 Published: 30-06-2025

ABSTRACT

Background: Despite being a core aspect of the management of diabetes, insulin therapy still continues to be refused or delayed by patients via certain perceived fears and beliefs. It is essential to understand these attitudinal barriers to facilitate improved compliance to the therapy and health status. **Objective:** To determine the frequency of factors leading to refusal of insulin administration in patients with diabetes. **Study Design:** Descriptive cross-sectional study. **Duration and Place of Study:** The study was conducted from April 2024 to September 2024 at the Department of Medicine, Shaikh Khalifa Bin Zayed Al Nahyan Hospital, CMH Rawalakot. **Methodology:** 127 diabetic patients aged between 18 and 60 years, counselled for insulin therapy but refused it or deferred it for a period of at least three months, were covered. The respondents were interviewed through a structured questionnaire, comprising demographic details, as well as various psychological, social, and practical factors associated with insulin refusal. **Results:** The mean age of participants was 41.30 ± 7.77 years, and the average BMI was 26.35 ± 2.90 kg/m^2. Most patients were male (66.9%), rural residents (54.3%), and had Type 2 diabetes (70.1%). The most commonly reported reason for insulin refusal was fear of social stigma (63%), followed by fear of pain (55.1%), cost concerns (51.2%), and interference with work and diet (50.4%). Additional notable factors included fear of hypoglycemia and dependency (both 49.6%), perceived disease progression (46.5%), feelings of self-blame (42.5%), and concerns about weight gain (40.9%). **Conclusion:** Our study has concluded that insulin refusal is influenced by a multifaceted interplay of social, psychological, and economic factors.

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder resulting from hyperglycemia due to defects either of insulin secretion, insulin action, or a combination of the above.[1] It can broadly be distinguished as type 1 diabetes, caused by autoimmune destruction of the pancreatic beta cells leading to absolute insufficiency of insulin, and type 2 diabetes, primarily characterized by insulin resistance and relative insufficiency of insulin.[2] Effective glycemic control is required to prevent acute complications like diabetic ketoacidosis and late microvascular and macrovascular complications.[3] Insulin therapy remains at the center of the treatment of diabetes, especially if oral antidiabetic drugs cannot achieve target glucose levels.[4] However, even for its therapeutic advantage, most patients dread the initiation of, as well as adherence to, insulin therapy.[5]

One of the major reasons for the rejection of insulin therapy is the fear of hypoglycemia.[6] The patients link insulin with sudden drops in blood glucose leading to dizziness, confusion, and even loss of consciousness.[5,6] The fear predominates among single patients or those with history of severe hypoglycemic attacks.[7] Besides, the fear of weight gain associated with insulin therapy frightens most people, more so those already obese or having metabolic syndrome.[8] Weight gain can be viewed as not only physical disability, but also as a backward step in the management of their entire health.[9]

Another significant barrier to the use of insulin is fear of pain related to the use of injections and the perceived message of disease advancement or failure of prior management by the institution of insulin.[10] Some patients have needle phobia or anxiety with self-administration, which can be a very strong psychological barrier.[11] Fear of necessity for life-long insulin use may also result in refusal, as patients fear loss of autonomy.[12] Additionally, insulin therapy has historically been framed as being disruptive of lifestyle, daily routines, employment schedules, and patterns of eating, and patients may be unwilling to incorporate it as a component of lifestyle.[13]

Social stigma and beliefs also contribute to the reluctance of insulin use.[14] Certain patients fear others will judge or misunderstand if they see insulin being administered in society, particularly in conservative or

close-knit groups.[15] Some groups also assume insulin use means the end of the diabetic life cycle, thereby inducing hopelessness and unacceptance.[16] Guilt or individual failure for the condition, together with the expense of insulin and accompanying equipment, such as syringes or glucometers, more discourage adherence.[16] These multi-dimensional concerns render it relevant to integrate comprehensive patient education and individualized support to increase insulin acceptability and diabetic outcomes.

A study conducted by Raghavendran S. et al. identified multiple factors contributing to the refusal of insulin therapy among patients with diabetes. The most commonly cited concern was the cost of treatment, reported by 74.3% of participants. Fear of pain was noted by 68.9%, while 57.4% expressed apprehension about becoming dependent on insulin. Interference with daily routines, including work and dietary habits, was a concern for 53.4%, and fear of social stigma was reported by 42.6% of the respondents. Additionally, beliefs about disease progression (38.5%), feelings of personal responsibility (35.8%), fear of hypoglycemia (31.8%), and perceived risk of weight gain (20.3%) also played significant roles in patients' reluctance to initiate insulin therapy.[17]

This research was planned to study the different factors of the rejection of insulin therapy among diabetic patients, since these barriers were frequently encountered in the clinic, albeit less frequently discussed. It was of importance to elicit patients' attitudes as a way of unearthing the psychological, social, and economical problems, which influenced the proper control of the disease. The findings were expected to facilitate healthcare providers to individualize more specific counseling interventions and improve compliance with insulin therapy. The research was also meant to fill the gap between clinic advice and patient acceptability, consequently improving control of diabetes and reducing complications risks.

METHODOLOGY

This descriptive cross-sectional investigation was conducted over a six-month span, from April to September 2024, in the Department of Medicine at Shaikh Khalifa Bin Zayed Al Nahyan Hospital, CMH Rawalakot. A total of 127 patients participated. Sample size was calculated using the WHO sample size calculator, based on a 95% confidence level, a 7% margin of error, and an anticipated frequency of 20.3% for concern about weight gain as a reason for declining insulin therapy.[17]

Participants were recruited through a non-probability consecutive sampling approach. Adults aged 18 to 60 years of both sexes were eligible if they had diabetes mellitus, defined by either a fasting plasma glucose value of at least 126 mg/dL after overnight fasting, a random plasma glucose of 200 mg/dL or above, or documented use of antidiabetic medications. Only those individuals who had been advised insulin therapy by their healthcare provider and had refused or postponed its initiation for a period of no less than three months were included. Exclusions were made for those with a history of gestational diabetes, serious mental or cognitive impairments, any medical contraindication to insulin use, terminal illness, Cushing's syndrome, pancreatitis, current pregnancy, breastfeeding, or recent hospitalization for critical illness.

After ethical clearance was obtained, patients fulfilling the eligibility criteria were approached for informed consent. The study's aims and procedures were explained in detail. Each participant underwent a face-to-face interview conducted by third-year medical residents trained in standardized data collection. Information was gathered on demographics, including age, sex, body mass index, education level, urban or rural residence, socioeconomic status, diabetes type, and disease duration.

Participants were administered a standardized questionnaire that dealt with several pertinent factors of insulin rejection. A person was counted as afraid of hypoglycemia if they agreed that they would be afraid of getting low blood sugar upon the initiation of insulin. If they believed insulin would give them unwanted weight, then it was coded as fear of weight gain. Fear of pain was categorized if the respondent feared physical pain due to the injurious effect of the insulin. If a respondent believed insulin would make them dependent for the remainder of life, then perceived dependence was coded. Any belief that insulin would interfere either with diet patterns or work-related responsibilities was coded as interfering with work and diet. Fear of being judged socially for the use of insulin counted those afraid of stigma. If a respondent believed that the initiation of insulin meant having a late- or advanced-staged disease, then perception of disease advancement was coded. Expressions of guilt or self-blame for uncontrolled blood sugar indicated feelings of responsibility. Lastly, if patients reported financial strain due to insulin therapy, it was marked as a cost concern. All responses were recorded on a customized data form.

Collected data were processed using SPSS version 26. Categorical variables were summarized using frequencies and percentages. For continuous variables mean ± standard deviation was used if data followed a normal distribution; otherwise, median and interquartile range were reported, guided by the Shapiro-Wilk test. Data were stratified by key variables, and associations between demographic or clinical factors and insulin refusal reasons were tested using Chi-square or Fisher's exact tests, with a p-value ≤0.05 regarded as statistically significant.

RESULTS

The study examined factors responsible for insulin refusal among 127 diabetic patients with a mean age of 41.30±7.77 years and BMI of 26.35±2.90 kg/m^2. The sample comprised predominantly males (66.9%) and rural residents (54.3%), with most patients having Type 2 diabetes (70.1%) and a mean diabetes duration of 5.62±2.83 years. Nearly half had low socioeconomic status (49.6%), and over half had primary education or were uneducated (58.3%) (as shown in Table-I).

Table I

Patient Demographics

Demographics		Mean ± SD
Age (years)		41.30±7.77
BMI (Kg/m^2)		26.35±2.90
Duration of diabetes (years)		5.62±2.83
Gender	Male n (%)	85 (66.9%)
	Female n (%)	42 (33.1%)

Residential Status	Rural n (%)	69 (54.3%)
	Urban n (%)	58 (45.7%)
Socioeconomic Status	Low n (%)	63 (49.6%)
	Middle n (%)	42 (33.1%)
	High n (%)	22 (17.3%)
Education	Uneducated n (%)	34 (26.8%)
	Primary n (%)	40 (31.5%)
	Secondary n (%)	33 (26.0%)
	Higher n (%)	20 (15.7%)
Type of diabetes	Type 1 n (%)	38 (29.9%)
	Type 2 n (%)	89 (70.1%)

The most prevalent factor for insulin refusal was fear of social stigma (63%), followed by fear of pain (55.1%), cost concerns (51.2%), and interference with work and diet (50.4%). Other significant factors included hypoglycemia fear (49.6%), dependence issues (49.6%), belief about disease progression (46.5%), feelings of responsibility (42.5%), and perceived risk of weight gain (40.9%) (as shown in Table-II).

Table II

Frequency of Factors Responsible for Refusal of Insulin Administration

Factors Responsible for Refusal of Insulin Administration	Frequency	% age
Hypoglycemia fear	63	49.6%
Perceived risk of weight gain	52	40.9%
Fear of pain	70	55.1%
Issues related to dependence	63	49.6%
Interference with work and diet	64	50.4%
Fear of social stigma	80	63%
Belief about disease progression	59	46.5%
Feelings of responsibility	54	42.5%
Cost concerns	65	51.2%

Age emerged as a critical determinant, with patients aged ≤40 years demonstrating overwhelming concern rates of 93.0% for hypoglycemia fear, pain fear, and social stigma fear, while also showing 93.0% for dependence issues and cost concerns, compared to substantially lower rates in patients >40 years (14.30%, 24.30%, 38.60%, 14.30%, and 17.10% respectively, all p<0.001). Notably, younger patients exhibited near-universal interference with work and diet concerns (96.5% vs 12.90%, p<0.001), while responsibility feelings were paradoxically lower in this group (73.7% vs 17.10%, p<0.001). Gender differences were statistically significant for several factors, with females showing higher weight gain risk concerns (26.20% vs 48.2%, p=0.017), pain fear (71.40% vs 47.1%, p=0.009), and responsibility feelings (64.30% vs 31.8%, p<0.001), while males demonstrated higher social stigma fear (60.0% vs 69.0%, p=0.320) and work interference concerns (42.4% vs 66.7%, p=0.010). Body mass index revealed stark contrasts, with patients having BMI ≤25 kg/m^2 showing universal prevalence (100.0%) for hypoglycemia fear, pain fear, social stigma fear, dependence issues, and cost concerns, while those with BMI >25 kg/m^2 demonstrated markedly reduced rates (5.90%, 16.20%, 30.90%, 5.90%, and 8.80% respectively, all p<0.001). Weight gain concerns paradoxically showed an inverse pattern, with higher BMI patients expressing greater concern (76.50% vs 0.0%, p<0.001), and work interference was notably lower in higher BMI patients (16.20% vs 89.8%, p<0.001). Socioeconomic status demonstrated a clear gradient effect, with low socioeconomic status patients showing 100.0% prevalence across all factors except weight gain concerns (0.0%), while middle socioeconomic status patients exhibited intermediate rates ranging from 0.00% to 71.40%, and high socioeconomic status patients showed minimal concerns with most factors at 0.00% except weight gain (100.00%) and responsibility feelings (9.10%). Educational attainment revealed inverse relationships across all factors, with uneducated patients demonstrating 100.0% prevalence for most concerns except weight gain (0.0%), while primary education patients showed moderate rates (72.50% for hypoglycemia fear, 80.00% for pain fear, 77.50% for social stigma), and higher education patients exhibited minimal concerns approaching 0.00% for most factors. Residential status showed pronounced urban-rural disparities, with rural patients demonstrating overwhelming prevalence rates of 91.3% for hypoglycemia fear, pain fear, social stigma fear, dependence issues, and cost concerns, contrasting sharply with urban patients who showed minimal rates (0.00% to 29.30%) across these factors, though urban patients expressed higher weight gain concerns (82.80% vs 5.8%, p<0.001). Disease duration analysis revealed that patients with diabetes ≤5 years consistently showed higher refusal rates, with 83.3% reporting hypoglycemia fear, 87.9% pain fear, 86.4% social stigma fear, and 86.4% cost concerns, compared to patients with longer duration who demonstrated substantially lower rates (13.10%, 19.70%, 37.70%, and 13.10% respectively, all p<0.001). Type 1 diabetes patients exhibited near-universal concern rates of 94.7% across all factors except weight gain (5.3%), while Type 2 diabetes patients showed more moderate rates ranging from 20.20% to 56.20%, with all comparisons reaching statistical significance (p<0.001) (as shown in Table-III).

Table III

Association of Factors Responsible for Refusal of Insulin Administration with Demographic Variables

Demographic Variable	Hypoglycemia Fear (%) (p)	Weight Gain Risk (%) (p)	Fear of Pain (%) (p)	Fear of Social Stigma (%) (p)	Dependence Issues (%) (p)	Interference with Work/Diet (%) (p)	Responsibility Feeling (%) (p)	Cost Concerns (%) (p)
Age ≤40 years	93.0% (<0.001)	3.5% (<0.001)	93.0% (<0.001)	93.0% (<0.001)	93.0% (<0.001)	96.5% (<0.001)	73.7% (<0.001)	93.0% (<0.001)
Age >40 years	14.30%	71.40%	24.30%	38.60%	14.30%	12.90%	17.10%	17.10%
Male	44.7% (0.116)	48.2% (0.017)	47.1% (0.009)	60.0% (0.320)	44.7% (0.116)	42.4% (0.010)	31.8% (<0.001)	47.1% (0.186)
Female	59.50%	26.20%	71.40%	69.00%	59.50%	66.70%	64.30%	59.50%
BMI ≤25 Kg/m^2	100.0% (<0.001)	0.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	89.8% (<0.001)	71.2% (<0.001)	100.0% (<0.001)
BMI >25 Kg/m^2	5.90%	76.50%	16.20%	30.90%	5.90%	16.20%	17.60%	8.80%

Low SES	100.0% (<0.001)	0.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	90.5% (<0.001)	73.0% (<0.001)	100.0% (<0.001)
Middle SES	0.00%	71.40%	11.90%	40.50%	0.00%	16.70%	14.30%	4.80%
High SES	0.00%	100.00%	9.10%	0.00%	0.00%	0.00%	9.10%	0.00%
Uneducated	100.0% (<0.001)	0.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	100.0% (<0.001)	94.1% (<0.001)	73.5% (0.001)	100.0% (<0.001)
Primary	72.50%	27.50%	80.00%	77.50%	72.50%	70.00%	52.50%	72.50%
Secondary	0.00%	63.60%	6.10%	45.50%	0.00%	12.10%	18.20%	6.10%
Higher	0.00%	100.00%	10.00%	0.00%	0.00%	0.00%	10.00%	0.00%
Rural	91.3% (<0.001)	5.8% (<0.001)	91.3% (<0.001)	91.3% (<0.001)	91.3% (<0.001)	88.4% (<0.001)	66.7% (<0.001)	91.3% (<0.001)
Urban	0.00%	82.80%	12.10%	29.30%	0.00%	5.20%	13.80%	3.40%
Duration ≤5 years	83.3% (<0.001)	10.6% (<0.001)	87.9% (<0.001)	86.4% (<0.001)	83.3% (<0.001)	87.9% (<0.001)	63.6% (<0.001)	86.4% (<0.001)
Duration >5 years	13.10%	73.80%	19.70%	37.70%	13.10%	9.80%	19.70%	13.10%
Type 1 Diabetes	94.7% (<0.001)	5.3% (<0.001)	94.7% (<0.001)	94.7% (<0.001)	94.7% (<0.001)	94.7% (<0.001)	94.7% (<0.001)	94.7% (<0.001)
Type 2 Diabetes	30.30%	56.20%	38.20%	49.40%	30.30%	31.50%	20.20%	32.60%

DISCUSSION

This study investigated the multi-dimensional insulin uptake barriers among diabetic patients, reporting how psychological, social, and demographic forces intensely affect adherence. The most common reason cited was social stigma (63%), as insulin therapy often presages severe disease, creating discrimination and isolation. Fear of pain (55.1%) stems from phobic fear of needles and anxiety, and concerns regarding cost (51.2%) illustrate the cost of a life of therapy. Practical concerns like interruption of work and diet (50.4%) and fears of hypoglycemia and dependency (49.6% respectively) also affect uptake. Younger patients (<40 years) had higher refusals due to career issues and therapy duration, and women were more affected by pain and weight fears. Poverty and education were linked to higher refusals due to health illiteracy and access. Rural patients had higher stigmata and less healthcare access. Patients diagnosed most recently or suffering from Type 1 diabetes had higher psychological resistance due to the immediate, permanent nature of insulin therapy.

Our study results were consistent with several key findings from previous research while revealing some notable differences in the prevalence and determinants of insulin refusal among diabetic patients. The overall pattern of insulin refusal factors in our study (63% social stigma fear, 55.1% pain fear, 51.2% cost concerns, 50.4% work/diet interference) aligns with the barriers identified by Elkarim & Abdelaziz (2021) [18] in Sudan, who found fear of hypoglycemia (72.0%), belief that insulin is "last resort" (64.5%), fear of weight gain (60.3%), and needle phobia (59.9%) as primary concerns. Both studies demonstrate that psychological and social factors significantly outweigh clinical considerations in insulin refusal decisions, suggesting universal patterns of patient resistance across different healthcare settings.

Age emerged as a particularly strong predictor in our study, with patients ≤40 years showing overwhelming concern rates of 93.0% for multiple factors compared to substantially lower rates in older patients (14.30-38.60%). This finding contrasts with Simon et al. (2019) [19] who found that age ≥60 years was associated with higher insulin refusal rates (AOR 3.93, 95% CI 1.55-9.97). The divergent age patterns may reflect cultural and generational differences in healthcare perceptions, where younger patients in our setting may be more concerned about social implications and lifestyle disruption, while older patients in the Malaysian study may have had more entrenched beliefs about insulin as a "last resort" treatment.

Gender differences in our study showed females having higher weight gain concerns (48.2% vs 26.20%, p=0.017) and pain fear (71.40% vs 47.1%, p=0.009), which parallels the findings of Şahin et al. (2024) [20] who demonstrated that injection fear correlated negatively with adherence across both genders (r=–0.309, P=0.005). The consistent pattern of higher anxiety and fear-related barriers among females across multiple studies suggests that gender-specific educational interventions addressing these concerns may be more effective than generic approaches.

Educational attainment showed inverse relationships with most refusal factors in our study, with uneducated patients demonstrating 100.0% prevalence for most concerns. This finding strongly supports the conclusions of Shah et al. [21] who found that higher education was positively associated with insulin knowledge (β=+0.32, P<0.001) and Elkarim & Abdelaziz [18] who reported that refusal was more frequent among less-educated patients (P<0.001). The consistent educational gradient across studies from different regions reinforces the critical role of health literacy in insulin acceptance and suggests that targeted educational interventions could significantly improve treatment adherence.

Socioeconomic status demonstrated a clear gradient effect in our study, with low socioeconomic status patients showing 100.0% prevalence across most factors except weight gain concerns. This finding aligns with the cost concerns reported by 51.2% of our patients and supports the healthcare system barriers identified by Wen et al. [22] who found that systemic issues such as manpower shortages remain significant obstacles even after provider training. The economic dimension of insulin refusal appears to be particularly pronounced in resource-limited settings, where both direct costs and indirect costs related to lifestyle modification create substantial barriers.

The diabetes type differences in our study, where Type 1 patients showed near-universal concern rates (94.7%) compared to Type 2 patients (20.20-56.20%), may reflect the different psychological adaptation processes between these populations. While none of the reviewed studies specifically examined type-based

differences in insulin refusal, the higher rates in Type 1 patients could be attributed to the more immediate and absolute necessity of insulin therapy, creating greater psychological stress and resistance. This finding suggests that diabetes type should be considered when developing targeted intervention strategies.

Our urban-rural disparities, with rural patients showing overwhelming prevalence rates (91.3%) compared to urban patients (0.00-29.30%), echo the findings of Shah et al. (2025) [21] who found urban residence positively associated with insulin knowledge (β=+0.19, P=0.021). The pronounced rural-urban divide in our study may reflect differences in healthcare access, educational opportunities, and cultural attitudes toward medical interventions, similar to the geographical variations observed in the multi-country systematic review by Shah et al. [21]

Disease duration analysis in our study revealed that patients with diabetes ≤5 years consistently showed higher refusal rates, contrasting with Shah et al. [21] who found longer duration of insulin use positively associated with knowledge (β=+0.28, P=0.008). This apparent contradiction may reflect the difference between insulin knowledge and insulin acceptance, where newly diagnosed patients may have greater emotional resistance despite potentially having access to more current information about insulin therapy.

The psychological dimensions identified in our study, particularly the high prevalence of social stigma fear (63%) and dependence issues (49.6%), strongly support the conclusions of Şahin et al. [20] who found that depression, anxiety, and needle fear are major barriers to insulin acceptance. The convergence of findings across different cultural contexts suggests that psychological evaluation and support should be considered standard components of insulin initiation protocols, as recommended by multiple studies in this body of literature.

This study had several limitations that must be considered in drawing conclusions from the findings. First, the single-center study design limits the external validity of results to other healthcare environments and populations, as the study was conducted at a single center which may be unique in patient population, healthcare, and cultural setting. Second, the sample size of only 127 patients may decrease the capability of the study to detect smaller effect sizes statistically and may not be reflective of the broader diabetic population. Third, the cross-sectional study design precludes the ability to determine causal associations between factors it has determined to be associated with insulin refusal, since no temporal associations can be determined from the study design. Additionally, the utilization of self-reported measures brings the potential of recall bias and social desirability bias, particularly if sensitive areas such as stigmata and psychological problems are being assessed. Finally, the study did not include standardized psychological measures, which would have provided more reliable measures of anxiety, depression, and other psychological variables potentially associated with insulin refusal decisions.

CONCLUSION

We have established that insulin rejection among diabetic patients stems from a complex interaction of psychological, social, cultural, and practical aspects. Insulin acceptance is more than a medical opinion, as it is largely decided by patients' fears, misconceptions, and circumstances of life. Defeating these challenges demands more than clinical counsel, but certain education, support, and at the community level measures to advance recognition as well as long-term control of diabetes.

Acknowledgments

We would like to express special thanks to the department's healthcare staff for their due consideration of patient information and tireless efforts toward correctrecord-keeping, which immensely facilitated this work.

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