ORIGINAL RESEARCH

Successful Health Care Provider Strategies to Overcome Psychological Insulin Resistance in United States and Canada

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Purpose: **To identify specific actions and characteristics of health care providers (HCPs) in the United States and Canada that influenced patients with type 2 diabetes who were initially reluctant to begin insulin.**

Methods: **Patients from the United States (n = 120) and Canada (n = 74) were recruited via registry, announcements, and physician referrals to complete a 30-minute online survey based on interviews with patients and providers regarding specific HCP actions that contributed to the decision to begin insulin.**

Results: **The most helpful HCP actions were patient-centered approaches to improve patients' understanding of the injection process (ie, "My HCP walked me through the whole process of exactly how to take insulin" [helped moderately or a lot, United States: 79%; Canada: 83%]) and alleviate concerns ("My HCP encouraged me to contact his/her office immediately if I ran into any problems or had questions after starting insulin" [United States: 76%; Canada: 82%]). Actions that were the least helpful included referrals to other sources (ie, "HCP referred patient to a class to help learn more about insulin" [United States: 40%; Canada: 58%]).**

Conclusions: **The study provides valuable insight that HCPs can use to help patients overcome psychological insulin resistance, which is a critical step in the design of effective intervention protocols. (J Am Board Fam Med 2020;33:198–210.)**

Keywords: **Canada, Health Personnel, Insulin Resistance, Patient-Centered Care, Surveys and Questionnaires, Type 2 Diabetes, United States**

Background

Treatments for type 2 diabetes (T2D), the most common form of diabetes worldwide, include oral antidiabetic (OAD) medications, noninsulin injectable medications, and insulin, in addition to lifestyle changes that encompass healthy eating, exercise, and weight control.[1,2] Guidelines from the American Diabetes Association and the Canadian Diabetes Association (Diabetes Canada) recommend a step-wise approach when treating patients with T2D.[1,2] Typically, the first line of therapy includes initiation of the OAD metformin, followed by sequential addition(s) of other OAD and/or injectable medications including insulin, particularly basal insulin, as needed.[1,3] Treatment with insulin is associated with higher rates of achieving adequate glycemic control, and early use of insulin can significantly lower the

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risks of long-term complications associated with T2D.[4–8]

Despite the demonstrated efficacy of insulin, a significant portion of T2D patients are reluctant to initiate insulin. For example, a 2017 study revealed that nearly 30% of patients with T2D originally refused to start insulin when recommended by their health care provider (HCP) and there was a significant delay (up to 2 years) among patients that did eventually begin therapy.[9] The reluctance of patients to initiate and adhere to insulin therapy, a phenomenon known as "psychological insulin resistance" (PIR), has been the focus of numerous studies.[10–15] Common contributors to PIR include patients' injection anxiety and misconceptions regarding the use and impact of insulin.[10,15]

Emerging research indicates that HCPs have an integral role in helping patients overcome PIR. For example, a 2013 qualitative study exploring barriers to insulin use among patients with T2D and the events that ultimately contributed to their acceptance of insulin found that patients' perception of the benefits of insulin and practical and emotional support from their HCP were major factors that affected the successful initiation of insulin therapy.[16] However, recent information regarding approaches used by HCPs that have helped initially reluctant patients begin insulin is limited. Understanding, from a patient's perspective, strategies that reduce the reluctance associated with insulin use could help HCPs motivate patients and accelerate transition to insulin. Successful strategies may vary by country, and for clinicians, it is helpful to understand the most and least helpful strategies in their own country. Therefore, the goal of this study was to describe separately, the strategies used by HCPs in the United States and Canada that aided patients with PIR to overcome their initial reluctance toward the use of insulin.

Methods

Data Source

The data used in this study were obtained from the AccEpting Insulin TreatMent for Reluctant PeOple with type 2 DIabetes Mellitus—A GlObal Study to IdeNtify Effective Strategies (EMOTION) study, an international investigation focused on adults with T2D who initially experienced significant PIR before the initiation of regular insulin use. In the EMOTION study, adults with T2D from 7 countries (Brazil, Canada, Germany, Japan, Spain, United Kingdom, and United States) were recruited from consumer panels, a diabetes registry, diabetes website announcements, and physician referrals. Of the 7 countries evaluated in the EMOTION study, here we describe, separately, survey findings from the United States and Canada.

This study was performed in accordance with the principles of the Declaration of Helsinki; all study participants provided informed consent. Regulatory approval for this study was provided by the Western Institutional Review Board (Puyallup, WA), as well as Nagoya University Institutional Review Board, Nagoya, Japan.

Study Design and Sample

The details of the study have been described elsewhere.[17] Briefly, the study included patients who indicated an initial reluctance to beginning basal insulin treatment (eg, those who were "not willing" or "slightly willing" to start insulin when first recommended by their HCP) but then eventually agreed to do so (within 3 years before survey completion). In addition, all participants were required to have had a diagnosis for T2D for at least 1 year before beginning basal insulin treatment and no prior use of insulin (including rapid-acting insulins). Patients with a diagnosis of type 1 diabetes were excluded.

All participants completed a 30-minute online survey between January and August 2017 that, among other patient-related attributes, captured information about HCP statements and actions regarding insulin initiation that may have occurred during medical visits by using a battery of 38 new items (the "PIR Action Survey"). Each PIR Action Survey item was rated on a 5-point Likert scale of 1 (did not occur) to 5 (did occur and helped a lot). The frequency of an item's occurrence was evaluated by dichotomizing the response options as 0 ("did not occur") and 1 ("did occur"). The degree of helpfulness in HCP actions was evaluated using a 4-point score for each event that occurred: 1 = not helpful to 4 = helped a lot.

Study Measures and Analysis

Patient characteristics that were assessed included source of recruitment (eg, registry, website, and physician referral), age, sex, ethnicity, body mass index (BMI), education level, employment, hemoglobin A1c (HbA1c) level at the time of insulin

initiation, time from diabetes diagnosis to insulin initiation, and prior use of an injectable antidiabetic agent. Additional measures included reaction to initial recommendation to start insulin (i.e., degree of surprise/being upset rated on a 4-point scale with 1 = not surprised/upset at all and 4 = very surprised/upset), time to insulin initiation following HCP's recommendation, thoughts and feelings about insulin before initiating insulin (25 questions that measured agreement to statements on a 5-point scale with 1 = strongly disagree and 5 = strongly agree), frequency of experiencing and helpfulness of different HCP actions that played a role in patients' decision to start insulin, and whether patients discontinued insulin for ≥7 days after initiation. Categorical measures were described using numbers and percentages, whereas continuous measures were described using means ± standard deviation (SD). All analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC). This study was descriptive in nature; no comparisons between countries were made.

Results

Of the 594 patients that met the selection criteria for the EMOTION study, 120 patients were from the United States and 74 were from Canada. Here, we describe survey results for these patients separately by their country of residence.

Demographics and Clinical Characteristics

Demographics and clinical characteristics are described in Table 1. In the United States, patients were, on average, 57 years of age (±11 years), 29% were males, 74% were non-Hispanic white/white, and the average BMI was 34.6 kg/m^2 (±8.4). On average, patients had been diagnosed with T2D for 10 years (±8 years) before starting insulin and 21% had previously used injectable antidiabetic medications. Before the initiation of insulin, the mean HbA1c value, among the 80 patients with a known result, was 9.5% (±1.9).

In Canada, the average age of surveyed patients was 56 years (±10 years), 64% were males, 80% were of Canadian ethnicity, and the average BMI was 30.2 kg/m^2 (±7.9). On average, patients had T2D for approximately 9 years (±7 years) before starting insulin and 20% had previously used injectable antidiabetics. The mean HbA1c value before insulin initiation, among the 45 patients with a known result, was 10.0% (±2.8).

Patient Perspective on Initiating Insulin

Patients' thoughts and feelings immediately before starting insulin are presented in Table 2. In general, the most common negative thoughts among patients before initiating insulin were feelings that associated the use of insulin with a personal failure to manage diabetes and less flexibility resulting from insulin dependence. The most common positive thoughts pertained to patients' views of insulin helping to control their blood glucose and prevent diabetic complications.

In the United States, patients often agreed or strongly agreed with the following negative thought about insulin right before initiation: "Taking insulin would mean my diabetes had become much worse" (86%). In contrast, patients often agreed/strongly agreed with the following positive statement about initiating insulin: "Taking insulin would help to maintain good control of blood glucose" (68%).

In Canada, patients often agreed or strongly agreed with the following negative and positive thoughts about insulin right before starting insulin, respectively: "Taking insulin would mean that I had failed to manage my diabetes with diet and tablets" (78%); "Taking insulin would help to maintain good control of blood glucose" (73%).

Patient Reaction to the Initial Recommendation for Insulin by their HCP

Patients' reaction following their HCP's recommendation to begin insulin, time to insulin initiation, and subsequent discontinuation (for ≥7 days) are described in Table 3. Among surveyed patients in the United States, approximately 12% were very surprised and 24% were very upset when insulin was first recommended by their HCP. Despite strong emotions, over 50% of all patients promptly initiated insulin (83% within 3 months), and only 10% reported that they stopped using insulin for ≥7 days after initiation.

When insulin was initially recommended to Canadian patients, approximately 16% were very surprised and 23% were very upset. However, 43% of all patients initiated insulin without delay (81% within 3 months), and only 14% reported that they stopped insulin for ≥7 days after initiation.

Table 1. Demographics and Clinical Characteristics of Surveyed Adult Type 2 Diabetes Mellitus Patients Experiencing Psychological Insulin Resistance Before Regular Insulin Use, 2017

Characteristic	Values by Location	
	United States (n = 120)	Canada (n = 74)
Type of recruitment, n (%)		
Panel	83 (69.2)	60 (81.1)
Health care provider referral	0 (0.0)	13 (17.6)
Recruitment through Diabetes.co.uk	1 (0.8)	1 (1.4)
TCOYD registry	36 (30.0)	0 (0.0)
Age, mean (SD)	56.8 (10.9)	55.8 (10.2)
Male, n (%)	35 (29.2)	47 (63.5)
Ethnicity, n (%)		
United States		
Asian	5 (4.2)	—
Black/African American	6 (5.0)	—
Latino/Hispanic/Chicano	10 (8.3)	—
Non-Hispanic white/Caucasian	89 (74.2)	—
Multiple ethnic background	5 (4.2)	—
Other	5 (4.2)	—
Canada		
Canadian	—	59 (79.7)
English	—	4 (5.4)
French	—	3 (4.1)
Other	—	8 (10.8)
Bachelor's degree (e.g., BA or BS) or higher education, n (%)	45 (37.5)	28.0 (37.8)
Current employment status, n (%)		
Working full-time or part-time	52 (43.3)	37 (50.0)
Not employed	18 (15.0)	10 (13.5)
Retired	33 (27.5)	20 (27.0)
Other	17 (14.2)	7 (9.5)
Years since first diabetes diagnosis to basal insulin initiation, mean (SD)	9.8 (8.0)	8.9 (7.3)
Year of first basal insulin use, n (%)		
2015	47 (39.2)	26 (35.1)
2016	51 (42.5)	36 (48.6)
2017	15 (12.5)	11 (14.9)
Prior use of injectable diabetes medications, n (%)	25 (20.8)	15 (20.3)
HbA1c before starting insulin*		
HbA1c (%), mean (SD)	9.5 (1.9)	10.0 (2.8)
Unknown, n (%)	40 (33.3)	29 (39.2)
HbA1c at the time of survey*		
HbA1c (%), mean (SD)	7.9 (1.5)	7.5 (2.0)
Unknown, n (%)	22 (18.3)	17 (23.0)
BMI before starting insulin (kg/m^2)		
Mean (SD)	35.5 (9.6)	30.6 (8.2)
BMI at the time of the survey (kg/m^2)		
Mean (SD)	34.6 (8.4)	30.2 (7.9)

BA, Bachelor of Arts; BS, Bachelor of Science; BMI, body mass index; HbA1c, hemoglobin A1c; SD, standard deviation; TCOYD, Taking Control of Your Diabetes.
*Mean HbA1c was calculated among the patients who had a test in the past year and knew the test result.

Table 2. Thoughts and Feelings Right Before Taking Insulin for the First Time—Surveyed Adult Type 2 Diabetes Mellitus Patients Experiencing Psychological Insulin Resistance Before Regular Insulin Use, 2017

Thoughts and Feelings before Starting Insulin for the First Time, n (%) Agree/Strongly Agree	Values by Location	
	United States (n = 120)	Canada (n = 74)
Taking insulin would mean I had failed to manage my diabetes with diet and tablets.	102 (85.0)	58 (78.4)
Taking insulin would mean my diabetes had become much worse.	103 (85.8)	47 (63.5)
Taking insulin would help to prevent complications of diabetes.	80 (66.7)	53 (71.6)
Taking insulin would mean other people would see me as a sick/sicker person.	60 (50.0)	30 (40.5)
Taking insulin would make life less flexible.	80 (66.7)	49 (66.2)
I was afraid of injecting myself with a needle.	74 (61.7)	41 (55.4)
Taking insulin would increase the risk of low blood glucose levels (hypoglycemia).	42 (35.0)	33 (44.6)
Taking insulin would help to improve my health.	78 (65.0)	53 (71.6)
Insulin would cause weight gain.	51 (42.5)	29 (39.2)
Managing insulin injections would take a lot of time and energy.	63 (52.5)	40 (54.1)
Taking insulin would mean I would have to give up activities I enjoy.	31 (25.8)	25 (33.8)
Taking insulin would mean my health would deteriorate.	34 (28.3)	24 (32.4)
Injecting insulin would be embarrassing.	45 (37.5)	23 (31.1)
Injecting insulin would be painful.	73 (60.8)	44 (59.5)
It would be difficult to inject the right amount of insulin correctly at the right time every day.	55 (45.8)	39 (52.7)
Taking insulin would make it more difficult to fulfill my responsibilities (at work, at home).	36 (30.0)	23 (31.1)
Taking insulin would help to maintain good control of blood glucose (sugar levels).	81 (67.5)	54 (73.0)
Being on insulin would cause family and friends to be more concerned about me.	70 (58.3)	40 (54.1)
Taking insulin would help to improve my energy level.	32 (26.7)	34 (45.9)
Taking insulin would make me more dependent on my doctor.	53 (44.2)	36 (48.6)
Taking insulin might cause serious health problems, like blindness, kidney problems or amputations.	26 (21.7)	24 (32.4)
Taking insulin would mean that my diabetes would become a much more serious disease.	64 (53.3)	40 (54.1)
Taking insulin would mean that I had failed, that I hadn't done a good enough job taking care of my diabetes.	95 (79.2)	51 (68.9)
Taking insulin would cause me to lose my job.	14 (11.7)	16 (21.6)
Taking insulin would mean that I would need to take insulin forever.	96 (80.0)	54 (73.0)
ITAS Scores		
Total negative items ITAS*,†,‡, mean (SD)	54.2 (9.9)	53.1 (11.2)
Total positive items ITAS*,†,§, mean (SD)	14.3 (2.1)	15.1 (2.8)
Total ITAS*,†,‡,§,‖, mean (SD)	64.0 (10.5)	62.0 (11.4)

ITAS, Insulin Treatment Appraisal Scale; SD, standard deviation.

*Agreement with statements was categorized as "strongly disagree" (corresponding to 1), "disagree" (corresponding to 2), "neither agree nor disagree" (corresponding to 3), "agree" (corresponding to 4), and "strongly agree" (corresponding to 5).

†ITAS scoring is based on Snoek et al.[32]

‡Total negative ITAS score was calculated by averaging the level of agreement to responses of 16 negatively oriented survey questions.

§Total positive ITAS score was calculated by averaging the level of agreement to responses of four positively oriented survey questions.

‖Total ITAS score was calculated by averaging the level of agreement to responses of the negatively oriented and positively oriented survey questions. The values of the positive-oriented survey questions were reversed (5 = 1, 4 = 2, 3 = 3, 2 = 4, 1 = 5). Higher total ITAS score indicates more negative appraisal of insulin treatment.

Table 3. Patient Reaction When Health care Provider First Said It Was Time to Start Taking Insulin and Insulin Taking Behavior of Surveyed Adult Type 2 Diabetes Mellitus Patients Experiencing Psychological Insulin Resistance Before Regular Insulin Use, 2017

Patient reaction to the Initial recommendation for insulin by their HCP	Values by Location	
	United States (n = 120)	Canada (n = 74)
Level of surprise when HCP first said it was time to take insulin, mean (SD)	2.3 (1.0)	2.2 (1.0)
Not surprised at all, n (%)	30 (25.0)	20 (27.0)
Slightly surprised, n (%)	42 (35.0)	28 (37.8)
Moderately surprised, n (%)	34 (28.3)	14 (18.9)
Very surprised, n (%)	14 (11.7)	12 (16.2)
Level of being upset when HCP first said it was time to take insulin, mean (SD)	2.8 (0.9)	2.6 (1.0)
Not upset at all, n (%)	5 (4.2)	8 (10.8)
Slightly upset, n (%)	46 (38.3)	27 (36.5)
Moderately upset, n (%)	40 (33.3)	22 (29.7)
Very upset, n (%)	29 (24.2)	17 (23.0)
Health care professional that helped most in decision to try insulin, n (%)		
Primary care physician	72 (60.0)	26 (35.1)
Nurse practitioner	11 (9.2)	3 (4.1)
Physician assistant	5 (4.2)	6 (8.1)
Medical assistant	1 (0.8)	1 (1.4)
Endocrinologist	16 (13.3)	23 (31.1)
Nurse	2 (1.7)	2 (2.7)
Dietician	4 (3.3)	1 (1.4)
Diabetes educator	4 (3.3)	12 (16.2)
Other	5 (4.2)	0 (0.0)
Time passed between HCP first recommended taking insulin and actually taking it regularly, n (%)		
I started taking it right away	62 (51.7)	32 (43.2)
Less than 1 week	9 (7.5)	7 (9.5)
About 1 or 2 weeks	10 (8.3)	7 (9.5)
About 1 month	4 (3.3)	8 (10.8)
2–3 months	14 (11.7)	6 (8.1)
4–6 months	7 (5.8)	5 (6.8)
7–12 months	9 (7.5)	2 (2.7)
More than 1 year	5 (4.2)	7 (9.5)
Stopped insulin for period of 7 or more days since first starting insulin, n (%)	12 (10.0)	10 (13.5)
During the first month after I first started taking insulin	2 (16.7)	3 (30.0)
1–3 months after I first started taking insulin	3 (25.0)	3 (30.0)
3–6 months after I first started taking insulin	0 (0.0)	2 (20.0)
More than 6 months after I first started taking insulin	7 (58.3)	2 (20.0)

HCP, health care provider; SD, standard deviation.

Among patients from the United States, most reported that the HCP most helpful in deciding to initiate insulin was the primary care physician (60%), and 13% reported that their endocrinologist was most helpful. In Canada, 35% of patients found their primary care physician to be the most helpful, 31% found their endocrinologist most helpful, and 16% reported that diabetes educators were most helpful.

HCP Actions That Affected Patients' Decision to Initiate Insulin

HCP actions that facilitated the initiation of insulin are presented, by country, in Table 4 (United States) and Table 5 (Canada). In both countries, the most frequently occurring actions around insulin initiation included HCP efforts to explain the value of starting insulin (e.g., "My HCP told me that my blood glucose numbers would improve

Table 4. United States Health care Provider Actions That Helped to Make the Decision to Give Insulin a Try—Surveyed Adult Type 2 Diabetes Mellitus Patients Experiencing Psychological Insulin Resistance Before Regular Insulin Use, United States, 2017

	Patients with Occurrence (n = 120)		Helpfulness among Patients with Occurrence	
Description	n	%	Mean (1–4 Scale of Helpfulness*)	% Helped Moderately or a Lot
HCP walked patient through the whole process of exactly how to take insulin	91	(75.8)	3.19	(79.1)
HCP encouraged the patient to contact his/her office immediately if the patient ran into any problems or had questions after starting insulin	99	(82.5)	3.14	(75.8)
HCP showed patient an insulin pen	85	(70.8)	3.13	(74.1)
HCP had patient try an injection himself/herself while patient was there in the office	47	(39.2)	3.13	(74.5)
HCP told patient that starting insulin could help the patient to live a longer and healthier life	86	(71.7)	3.12	(79.1)
HCP explained to the patient that the final decision to try insulin was patient's, not his/hers	72	(60.0)	3.10	(72.2)
HCP reviewed patient's blood sugar numbers with the patient, showing the patient that his/her diabetes was not under control and that action was needed	106	(88.3)	3.08	(73.6)
HCP helped patient to see how simple it was to inject insulin	80	(66.7)	3.01	(76.3)
HCP warned patient that he/she was likely to develop complications if the patient did not get started soon with insulin to control his/her diabetes	85	(70.8)	3.00	(67.1)
HCP told patient that blood glucose numbers would improve after patient started insulin	110	(91.7)	2.92	(70.0)
HCP took time to answer all the patient's questions and address his/her concerns about insulin	95	(79.2)	2.92	(65.3)
HCP told patient that by going on insulin, he/she might soon be able to discontinue other diabetes medications	55	(45.8)	2.89	(63.6)
HCP reassured patient that taking insulin was not going to cause complications, like blindness, kidney disease, or a heart attack	70	(58.3)	2.86	(62.9)
HCP helped patient to see that an insulin injection was not as painful as patient thought it might be	68	(56.7)	2.84	(61.8)
HCP showed patient how small the actual needle was	70	(58.3)	2.81	(62.9)
HCP told patient that starting insulin would help the patient to feel better	100	(83.3)	2.81	(61.0)
HCP explained that insulin was a natural substance that the patient's body needed	93	(77.5)	2.81	(64.5)
HCP helped patient to understand that taking insulin did not have to be as much of a burden as the patient had feared	91	(75.8)	2.79	(64.8)
HCP gave patient leaflets or other reading material about insulin	74	(61.7)	2.77	(60.8)
HCP helped patient to understand how insulin works in patient's body to lower blood sugars and improve patient's health	93	(77.5)	2.76	(63.4)
HCP said that the he/she could not continue to treat patient if the patient refused to start insulin	21	(17.5)	2.76	(61.9)

Continued

Table 4. Continued

Description	Patients with Occurrence (n = 120)		Helpfulness among Patients with Occurrence	
	n	%	Mean (1–4 Scale of Helpfulness*)	% Helped Moderately or a Lot
HCP reassured patient that taking insulin did not mean that diabetes was now a more serious condition	76	(63.3)	2.74	(56.6)
HCP explained that the patient might not have to take insulin forever	69	(57.5)	2.72	(58.0)
HCP told patient about all of the positives and negatives of insulin and explained how the positives outweighed the negatives	85	(70.8)	2.72	(62.4)
HCP took the time to ask the patient about the reasons why the patient did not want to take insulin	74	(61.7)	2.72	(59.5)
HCP and patient talked about the real costs of insulin and insulin supplies and together figured out a way to make it more affordable	51	(42.5)	2.67	(54.9)
HCP encouraged patient to try it for a while and see if it might help the patient feel better	83	(69.2)	2.65	(54.2)
HCP reassured patient that the risk of having a serious problem with hypoglycemia while taking insulin was low	74	(61.7)	2.65	(51.4)
HCP reassured the patient that he/she would help the patient avoid or minimize any weight gain because of taking insulin	53	(44.2)	2.64	(54.7)
HCP gave an injection while patient was there in the office	36	(30.0)	2.64	(55.6)
HCP helped patient to recognize that insulin was more natural than the pills the patient was taking	60	(50.0)	2.63	(53.3)
HCP told patient that he/she just needed to trust that the HCP knew best and that getting started on insulin was the patient's best option	69	(57.5)	2.62	(56.5)
HCP helped patient get over his/her fears that others would treat the patient differently because he/she were taking insulin	52	(43.3)	2.62	(53.8)
HCP helped patient to realize that insulin wasn't going to cost patient as much money as the patient feared it would	57	(47.5)	2.60	(56.1)
HCP helped patient meet other people who had already been taking insulin for a while	17	(14.2)	2.53	(52.9)
Repeatedly over many visits, HCP kept trying to convince the patient to get started on insulin	60	(50.0)	2.47	(48.3)
HCP referred patient to a class to help learn more about insulin	48	(40.0)	2.46	(39.6)
HCP warned patient that he/she could not be responsible for what might happen if the patient did not start insulin soon	40	(33.3)	2.45	(42.5)

HCP, health care provider.
*Level of helpfulness was scored on a scale of 1 (it did not help at all) to 4 (it helped a lot). Items that did not occur for patients were considered missing.

after I started insulin" [United States: 92%; Canada: 93%]) and to increase patients' understanding and confidence regarding injections (e.g., "My HCP walked me through the whole process of exactly how to take insulin" [United States: 76%; Canada: 89%]).

HCP actions most helpful, when they occurred, involved collaborative approaches to improve patients' understanding of the injection process (e.g., "My HCP walked me through the whole process of exactly how to take insulin" [% helped

Table 5. Canadian Health care Provider Actions That Helped to Make the Decision to Give Insulin a Try—Surveyed Adult Type 2 Diabetes Mellitus Patients Experiencing Psychological Insulin Resistance Before Regular Insulin Use, Canada 2017

	Patients with Occurrence (n = 74)		Helpfulness among Those with Occurrence	
Description	n	%	Mean (1-4 Scale of Helpfulness*)	% Helped Moderately or a Lot
HCP walked patient through the whole process of exactly how to take insulin	66	(89.2)	3.38	(83.3)
HCP encouraged the patient to contact his/her office immediately if the patient ran into any problems or had questions after starting insulin	61	(82.4)	3.34	(82.0)
HCP helped patient to see how simple it was to inject insulin	60	(81.1)	3.22	(76.7)
HCP showed patient how small the actual needle was	51	(68.9)	3.22	(82.4)
HCP told patient that blood glucose numbers would improve after patient started insulin	69	(93.2)	3.19	(78.3)
HCP took time to answer all the patient's questions and address his/her concerns about insulin	69	(93.2)	3.19	(81.2)
HCP helped patient to see that an insulin injection was not as painful as patient thought it might be	54	(73.0)	3.19	(79.6)
HCP gave an injection while patient was there in the office	34	(45.9)	3.15	(73.5)
HCP explained that the patient might not have to take insulin forever	40	(54.1)	3.13	(77.5)
HCP told patient that by going on insulin, he/she might soon be able to discontinue other diabetes medications	52	(70.3)	3.12	(71.2)
HCP told patient that starting insulin would help the patient to feel better	65	(87.8)	3.11	(75.4)
HCP showed patient an insulin pen	62	(83.8)	3.10	(74.2)
HCP told patient that starting insulin could help the patient to live a longer and healthier life	64	(86.5)	3.09	(75.0)
HCP explained to the patient that the final decision to try insulin was patient's, not his/hers	57	(77.0)	3.09	(77.2)
HCP helped patient to understand that taking insulin did not have to be as much of a burden as the patient had feared	68	(91.9)	3.07	(75.0)
HCP had patient try an injection himself/herself while patient was there in the office	41	(55.4)	3.07	(75.6)
HCP reviewed patient's blood sugar numbers with the patient, showing the patient that his/her diabetes was not under control and that action was needed	70	(94.6)	3.07	(78.6)
HCP explained that insulin was a natural substance that the patient's body needed	67	(90.5)	3.04	(73.1)
HCP encouraged patient to try it for a while and see if it might help the patient feel better	54	(73.0)	3.04	(77.8)
HCP warned patient that he/she was likely to develop complications if the patient did not get started soon with insulin to control his/her diabetes	62	(83.8)	3.03	(71.0)
HCP reassured patient that the risk of having a serious problem with hypoglycemia while taking insulin was low	62	(83.8)	2.97	(72.6)
HCP reassured patient that taking insulin was not going to cause complications, like blindness, kidney disease, or a heart attack	51	(68.9)	2.96	(70.6)
HCP and patient talked about the real costs of insulin and insulin supplies and together figured out a way to make it more affordable	41	(55.4)	2.95	(70.7)

Continued

Table 5. Continued

Description	Patients with Occurrence (n = 74)		Helpfulness among Those with Occurrence	
	n	%	Mean (1-4 Scale of Helpfulness*)	% Helped Moderately or a Lot
HCP took the time to ask the patient about the reasons why the patient did not want to take insulin	55	(74.3)	2.95	(67.3)
HCP helped patient to understand how insulin works in patient's body to lower blood sugars and improve patient's health	62	(83.8)	2.94	(74.2)
HCP reassured patient that taking insulin did not mean that diabetes was now a more serious condition	61	(82.4)	2.92	(65.6)
HCP helped patient get over his/her fears that others would treat the patient differently because he/she were taking insulin	33	(44.6)	2.88	(75.8)
HCP told patient that he/she just needed to trust that the HCP knew best and that getting started on insulin was the patient's best option	51	(68.9)	2.86	(62.7)
HCP warned patient that he/she could not be responsible for what might happen if the patient did not start insulin soon	29	(39.2)	2.86	(69.0)
HCP gave patient leaflets or other reading material about insulin	48	(64.9)	2.83	(62.5)
HCP helped patient to recognize that insulin was more natural than the pills the patient was taking	50	(67.6)	2.82	(64.0)
HCP told patient about all of the positives and negatives of insulin, and explained how the positives outweighed the negatives	60	(81.1)	2.82	(65.0)
HCP reassured the patient that he/she would help the patient avoid or minimize any weight gain because of taking insulin	39	(52.7)	2.79	(59.0)
Repeatedly over many visits, HCP kept trying to convince the patient to get started on insulin	37	(50.0)	2.76	(59.5)
HCP referred patient to a class to help learn more about insulin	36	(48.6)	2.75	(58.3)
HCP helped patient to realize that insulin was not going to cost patient as much money as the patient feared it would	41	(55.4)	2.71	(58.5)
HCP said that the he/she could not continue to treat patient if the patient refused to start insulin	20	(27.0)	2.70	(70.0)
HCP helped patient meet other people who had already been taking insulin for a while	20	(27.0)	2.30	(50.0)

HCP, health care provider.

*Level of helpfulness was scored on a scale of 1 (it did not help at all) to 4 (it helped a lot). Items that did not occur for patients were considered missing.

moderately or a lot, United States: 79%; Canada: 83%]), ongoing support (e.g., "My HCP encouraged me to contact his/her office immediately if I ran into any problems or had questions after starting insulin" [United States: 76%; Canada: 82%]), and explanations of the benefits of insulin. Although many of the specific HCP actions that were found helpful occurred frequently, some actions, which occurred less frequently, were also found to be helpful (e.g., "My HCP had me try an injection myself while I was there in the office" [United States: 75%; Canada: 76%]). The least helpful action in both countries was referral elsewhere for diabetes education (e.g., "HCP referred patient to a class to help learn more about insulin" [% helped moderately or a lot, United States: 40%; Canada: 58%]).

Discussion

This study provides insight regarding HCP practices in the United States and Canada that influenced insulin initiation among patients with T2D

who initially experienced PIR. Among the patients surveyed, HbA1c values at the time of insulin initiation were close to 10%, which is substantially higher than the guideline-recommended threshold of 7%.[18] Despite this, nearly one-fifth of the patients were surprised and a one-fourth were upset at the time of the initial recommendation from their HCP to begin insulin. However, most patients initiated insulin within 3 months following their HCP's initial recommendation and continued to use insulin once initiated.

Overall, the findings of this study provide evidence that in both the United States and Canada, HCP actions have a considerable effect on patients' decision to start insulin. The most helpful HCP actions were collaborative approaches to improve patients' understanding of insulin and the injection process, and providing ongoing support. HCP characteristics that were least helpful included threatening statements and referrals to different sources, findings that are consistent with the results from the global EMOTION survey.[17]

Given the chronic and progressive nature of T2D, most patients will require psychological support from their HCP at some point during therapy.[5,19] Due to the frequency of office visits necessary to manage diabetes, HCPs have a unique opportunity to influence patient decisions regarding care management. To accomplish this, adequate support when initiating treatment and fostering behaviors to sustain effective self-management is essential.[20–23] Previous studies that assessed patient perspectives following interaction with their HCPs have also found similar results. For example, results from a 2014 Canadian study that evaluated HCP practices and patient perceptions regarding second-line therapy found that patients valued feeling informed regarding the risk/benefits of initiating insulin and that they received sufficient time and attention from their HCP to get their questions answered and learn about the risks/benefits of insulin.[24] Similarly, a 2016 study conducted in 18 different countries that evaluated aspects of the patient-HCP relationship that affect insulin adherence found that patients were negatively affected by the lack of attention from their physician, whereas patients whose physicians took time to communicate treatment goals experienced greater adherence to treatment.[25] Results of the present study highlighting the positive effect of HCP support and patient empowerment align with guideline-based treatment recommendations from the American Diabetes Association and European Association for the Study of Diabetes to improve insulin adherence and achieve glycemic control.[26]

Our study results also indicate that the types of providers that most influence a patient's decision to start insulin could vary by country. In this survey, nearly half of the respondents from Canada found the actions of specialists—that is, endocrinologists (31%) and diabetes educators (16%)—to be most helpful in addressing PIR. In comparison, 60% of the respondents from the United States found their primary care physician's action to be the most helpful, and only 16% preferred the specialists. Although additional research is needed to understand the specific reasons behind these patient preferences, the study findings could, in part, be attributed to the differences in physician attributes and health care systems across the 2 countries. For example, recent studies have reported that primary care physicians in the United States do not perceive the complexity of insulin regimen to be a barrier to insulin initiation, and in fact, they routinely make the initial recommendation to start insulin to the T2D patients, with only 10% of the cases being referred to specialists.[27,28] In comparison, a qualitative study of general practitioners (GPs) in Canada found that some general practitioners rely on nurse educators and/or specialists to facilitate "insulin starts," as it involves more intensive patient education and ongoing monitoring.[29] As such, it is possible that, unlike Canada, many patients in the United States do not even interact with a specialist at the time of insulin initiation. Nonetheless, these findings suggest that any future efforts targeted at reducing PIR should consider the diversity of HCP types within and across countries.

This study provides important insights regarding HCP actions that can help patients overcome PIR and, thus, better manage their diabetes. However, this study should be viewed within the context of certain limitations. First, additional research is needed to understand the true reasons behind the stated reluctance to initiate insulin. In this study, we assumed that any reluctance to start insulin treatment is psychological—that is, due to patient attitudes and beliefs about insulin and the injection process. Although PIR is a well-documented phenomenon among patients with T2D, the reluctance to initiate insulin may also be driven by other, nonpsychological factors, such as

financial considerations (particularly in the United States) and whether patients had access to educational and counseling resources at the time of insulin initiation. Second, due to the small sample size, it is possible that surveyed participants may not be representative of T2D patients who are reluctant to initiate insulin. For example, T2D is most prevalent among nonwhite ethnicities;[30,31] however, in this study, the majority of participants were white. Similarly, patients volunteering to participate in research may have a higher literacy level than the overall T2D patients. Finally, this study may be subject to limitations that are inherent to survey-based studies. For example, self-reported data for past events may be subject to recall bias. However, given that the initiation of insulin is an important milestone in diabetes management, it is likely that patients are more likely to accurately recall their experience and the events that aided their successful initiation of insulin.

Conclusions

This study demonstrated that in both the United States and Canada, collaborative approaches that address patients' attitudes and concerns about insulin as well as the injection process are likely to result in an earlier initiation of insulin. Furthermore, this study provides evidence regarding potentially useful strategies for providers to help patients overcome PIR in the United States and Canada, which is a critical step in the design of effective intervention protocols and broader clinical recommendations for HCPs.

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