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Physician–patient communication at diagnosis of type 2 diabetes and its links to patient outcomes: New results from the global IntroDia® study

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ABSTRACT

Aims: To investigate patient experiences during the diagnosis of type 2 diabetes mellitus (T2DM), focusing on how physician–patient communication at diagnosis influences patients' psychosocial stress and subsequent self-management and outcomes.

Methods: We surveyed adults with T2DM in 26 countries in a large cross-national study of physician–patient communication during early T2DM treatment (IntroDia®). The self-report questionnaire assessed retrospectively patient experiences during diagnosis conversations (focusing on 43 possible conversational elements, and communication quality) and potential effects on patient-reported outcomes.

Results: Data from 3628 people with T2DM who had been prescribed oral treatment at diagnosis were analysed. Exploratory factor analyses of the conversational elements yielded four coherent, meaningful factors: Encouraging (Cronbach's $\alpha = 0.86$); Collaborative ($\alpha = 0.88$); Recommending Other Resources ($\alpha = 0.75$); and Discouraging ($\alpha = 0.72$). Patient-perceived communication quality (PPCQ) at diagnosis was positively associated with Encouraging ($\beta = +1.764$, $p < 0.001$) and Collaborative ($\beta = +0.347$, $p < 0.001$), negatively associated with Discouraging ($\beta = -1.181$, $p < 0.001$) and not associated with Recommending Other Resources ($\beta = +0.087$, $p = 0.096$), using a stable path model. PPCQ was associated with less current diabetes distress, greater current well-being and better current self-care. Conversation elements comprising factors associated with better PPCQ (Encouraging and

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Collaborative) were recalled more frequently by patients than elements associated with poor PPCQ (Discouraging).

Conclusions: Better physician–patient communication at T2DM diagnosis may contribute to subsequent greater patient well-being and self-care, and may be enhanced by greater physician use of Collaborative and Encouraging conversation elements.

1. Introduction

The personal experiences of patients when first receiving a diagnosis of type 2 diabetes mellitus (T2DM) may have a significant and long-lasting impact on their diabetes-related attitudes and behaviours, which may, in turn, affect clinical outcomes in the short- and long-term. Many patients report profoundly negative reactions at the time of the T2DM diagnosis [1–8]; these initial emotional responses can endure over long periods of time [3] and may be linked to poor long-term glycaemic control [6]. In particular, the attitudes, behaviours and specific messages that physicians display towards their patients at the T2DM diagnosis are likely to be crucial in influencing patient attitudes about T2DM as well as their interest, ability and willingness to follow self-care recommendations over time [9]. More effective communication between patients and physicians at diagnosis may improve patients' understanding of, and engagement with, the disease, leading to better self-management over time as well as better clinical outcomes [10–12]. Indeed, if the physician provides a clear delivery of the diagnosis, coupled with a specific care plan and a sense of hope that the patient's T2DM can be managed successfully with ongoing support from the physician and clinical staff, the result may be a long-lasting, positive impact on the patient's behaviour and attitude [7].

While these findings point to the importance of dialogue between physician and patient at the point of diagnosis, as well as over the months and years post-diagnosis, what remains unknown is how the specific elements of the diagnosis conversation (i.e., what the physician says or does) will influence long-term patient attitudes, behaviours and – perhaps – clinical outcomes. This key aspect of physician–patient communication is being explored in IntroDia®, which is, to date, the largest multinational non-interventional study dedicated to understanding and optimising these early conversations between physicians and patients with T2DM. IntroDia® comprises two survey samples: one that includes over 6700 physicians treating patients with T2DM, and another including over 10,000 people with T2DM. This retrospective study is designed to examine the potential importance and impact of early conversations at two points in time: (1) at diagnosis and (2) when additional oral medication is prescribed.

Here we report the IntroDia® survey results for patients at diagnosis, which investigated patient-reported memories of their experiences of the consultation when their physician first informed them that they had T2DM. Key objectives of the patient survey were to determine the common messages and actions that reportedly occurred during the conversation and how these messages were perceived by patients and may have influenced key patient-reported outcomes, including indices of current quality of life as well as adherence to diabetes self-care behaviours. As a result, the study hopes to identify ways to improve these early conversations in order to help create effective solutions for long-term T2DM management.

2. Materials and methods

2.1. *Study design and participants*

IntroDia®, which was planned by a multidisciplinary international advisory board, involved non-interventional, retrospective surveys of physicians and people with T2DM. The advisory board was comprised of a behavioural psychologist, diabetologist, endocrinologist, primary care physician, diabetes nurse consultant, and diabetes nurse educator. The surveys were conducted mainly by online questionnaires, with telephone and in-person interviews if required, and the physician and patient groups were not matched.

The patient survey was conducted in 26 countries across six continents. Selection was based on the inclusion of people with T2DM from a broad range of nationalities and cultures, focussing on those countries with high rates of T2DM. The countries included: Argentina, Australia, Austria, Brazil, Bulgaria, Canada, China, Denmark, France, Germany, India, Indonesia, Israel, Japan, Republic of Korea, Mexico, the Netherlands, Norway, the Philippines, Russia, Saudi Arabia, South Africa, Spain, United Arab Emirates, the United Kingdom, and the United States of America.

To investigate two key moments in the early treatment of T2DM, two distinct groups were surveyed: (1) people with T2DM with experiences during the diagnosis conversation (the focus of this paper) and (2) those with experiences during the "add-on conversation", i.e., the conversation when an additional oral medication is prescribed (after initial monotherapy with an oral antidiabetes drug [OAD]). GfK (Basel, Switzerland), an international market research organisation, translated the survey questionnaire, conducted the fieldwork, prepared the data files and performed the initial data analyses.

Eligible participants were aged ≥18 years, who had a confirmed diagnosis of T2DM ≥1.5 years previously, and reported that they had received their diagnosis from either a primary care physician or physician specializing in diabetes. Within the diagnosis conversation group there were two subsets: patients diagnosed with T2DM up to 5 years previously who had received lifestyle recommendations (diet and exercise) but no medication, and patients diagnosed with T2DM up to

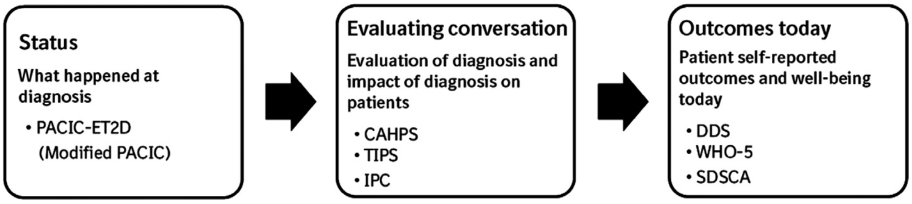

Fig. 1 – Questionnaire process flow, including scales used, for patient diagnosis survey. The PACIC was modified so that the items touched more explicitly on the early experiences of T2DM patients. The IntroDia® advisory panel reviewed and modified existing items and constructed additional items, all based on initial hypotheses about the early physician–patient interactions and in response to a review of discussions regarding the diagnosis experience with physicians and patients during focus groups and online bulletin boards. The final instrument comprised 43 items, or "conversational elements" (PACIC-ET2D). Evaluating communication was assessed following the approach developed by Ratanawongsa and colleagues [17], combining eight items from CAHPS, TIPS and IPC. CAHPS, Consumer Assessment of Healthcare Providers and Systems; DDS, Diabetes Distress Scale; IPC, Interpersonal Processes of Care; PACIC-ET2D, Patient Assessment of Chronic Illness Care scale (Modified); SDSCA, Summary of Diabetes Self-Care Activities; TIPS, Trust In Physician Scale; WHO-5, WHO-5 Well-being Index.

1.5 years previously who had received lifestyle advice and had been prescribed an OAD at diagnosis. Since one of the key outcomes concerned medication adherence, the current study focused primarily on the latter group, the subset of patients who had received an OAD.

The survey followed national and international guidelines for the conduct of non-interventional studies, and was reviewed and approved by an independent institutional review board (Aspire IRB). The survey also adhered to globally accepted guidelines for the conduct of market research and pharmaceutical market research from the European Society for Opinion and Marketing Research [13], the European Pharmaceutical Market Research Association [14] and the Council of American Survey Research Organizations [15].

2.2. *Survey battery*

The survey consisted of three major sections: reported experiences during the diagnosis conversation, overall perception of physician–patient communication during the diagnosis conversation, and current attitudinal and behavioural outcomes. The questionnaire flow for the patient diagnosis survey is shown in Fig. 1.

First, reported experience during the diagnosis conversation was measured using the Patient Assessment of Chronic Illness Care scale (PACIC) [16], modified and expanded so that the items touched explicitly on the early experiences of patients with T2DM. The goal was to include items that not only touched on critical physician actions and procedures (the core dimension of the original PACIC scale; e.g., "asked for my ideas when we made a treatment plan"), but also items that covered key physician advice and information provided (e.g., "told me that a lot can be done to control my diabetes"). In this manner, we hoped to capture a broader sense of what the physician *did* and *said* at the time of diagnosis (based, of course, on patient reports). Towards this end, a series of focus groups were organised, comprising physicians ($n = 34$) and patients ($n = 34$) in the United States, Mexico, Germany and Japan; these groups were asked to detail the typical events occurring at the T2DM diagnosis, focusing on the physicians' statements and actions at that time. In addition, online bulletin boards sought input from additional physicians ($n = 35$) and patients ($n = 35$) in these countries (except Japan). Subsequently, the IntroDia® advisory panel reviewed transcripts from these groups and online responses, then proceeded to modify the existing original 20 PACIC items and construct 23 additional items. The final instrument comprised 43 items, or "conversational elements" (PACIC-ET2D).

Second, the patient's perception of the overall quality of communication by the physician (patient-perceived communication quality) during the diagnosis conversation was assessed following the approach developed by Ratanawongsa and colleagues [17], which combines eight items from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) [18,19], Trust In Physician Scale (TIPS) [20,21] and Interpersonal Processes of Care (IPC) [22] questionnaires. The response options for the TIPS and IPC items were modified to match the CAHPS 4-point scale options ("never"; "sometimes"; "usually"; and "always") and a summary score (range 0–100, where 100 represents more positive experiences) was calculated by linear transformation and averaging of CAHPS responses [17].

Finally, patient-reported outcomes following the conversation were assessed using the WHO-5 Well-being Index[1] (WHO-5), the Diabetes Distress Scale (DDS),[2] and the Summary of Diabetes Self-Care Activities (SDSCA) [23]. The WHO-5 is a commonly used 5-item scale that measures emotional well-being, and which has been applied to patients with T2DM [24]. A raw score (calculated by totalling the figures of the five answers) ranges from 0 (worst possible) to 25 (best possible) quality of life, and this is multiplied by 4 to provide a percentage score. The DDS assesses current diabetes-related distress by assessing patient concerns and worries that are related specifically to diabetes and its man-

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[1] ©Psychiatric Research Unit, Mental Health Centre North Zealand, University of Copenhagen, DK-3400 Hillerød, Denmark.

[2] DDS 5.8.15 ©William H. Polonsky, Lawrence Fisher.

agement; studies have shown it to be a good indicator of diabetes-related quality of life [25]. Two of the four DDS subscales, emotional burden subscale and regimen-related distress, were included in IntroDia®. The scale ranges from 1 to 6, where 1 represents less distress and 6 represents more distress. Finally, the SDSCA [23] assesses current self-care behaviour; for IntroDia®, the weekly frequency of four self-management domains was measured: following a healthy diet; consuming specific types of foods; following an exercise programme; and adherence to drug regimen. The scoring is based on the metric "days per week" instead of percentages, thus indicating on how many of the previous 7 days the patient undertook the specified self-care activity.

The survey battery was reviewed, approved and tested first in English before being translated into local languages as required in each participating country. Translation followed a process similar to that used by the World Health Organization [26] in order to ensure validity with the original battery. First, the survey battery was translated by two independent, professional translators, who merged the two translations into one version. This version was then back-translated by a translator and expert (usually an endocrinologist) to ensure that the translation was accurate. The survey battery was then pilot-tested in each country, with a cognitive debriefing following the pilot to discuss translation/comprehension issues. In the case of standard questionnaires, validated translations from the owners of the questionnaire were used (if no translation was available, the World Health Organization translation approach was applied).

2.3. *Statistical analyses*

Patient characteristics and other variables were summarised using descriptive statistics. Further, an exploratory factor analysis was used to group the 43 conversation elements into patient-perceived dimensions in order to identify the underlying factors. Principal components analysis with varimax rotation was conducted to investigate the groupings of conversation elements. The number of factors to retain before rotation was determined using the Kaiser–Guttman rule [27] and Cattell's scree plot [28]. Internal consistency was assessed using Cronbach's coefficient alpha (α). The degree of linear dependence between factors was evaluated using Pearson's product-moment correlation coefficient (r).

A stable path model was used to investigate: (1) the association between the factors and patient-perceived communication quality and (2) the association between patient-perceived communication quality and patient-reported outcomes. Of note, the exploratory factor analysis was applied to all patients in the diagnosis group (whether or not they had begun taking an OAD at the time of diagnosis) as they had all completed the same diagnosis questionnaire; the stable path model, however, was applied only to the patients who were the central focus of this study – those who had received an OAD at diagnosis. Statistical analyses were performed using IBM SPSS Statistics Version 22.0 (IBM Corp., Armonk, NY, USA), IBM SPSS AMOS (Analysis Of a Moment Structures [AMOS] Version 23.0) and SAS/STAT software Version 9.4 or greater (SAS Institute Inc., Cary, NC, USA).

3. Results

The survey, conducted between November 2013 and January 2015, was completed by 2276 people with T2DM who had received diet and exercise recommendations but no medication, and by 3628 people with T2DM who had received lifestyle advice and had been prescribed an OAD at diagnosis (the latter group being the central focus of these analyses). As seen in Table 1, mean age was 50.6 (±12.3 SD) years and 48% were male. Patient-perceived communication quality was rated as relatively high (mean [SD] score = 3.2 [0.8]). Overall well-being (WHO-5) fell above the commonly used cut-off score of 50 (mean [SD] = 59.4 [26.1]), indicating that it was broadly satisfactory, though diabetes distress was elevated, with mean [SD] scores on both DDS subscales falling above the 2.0 threshold (2.5 [1.3]). Mean [SD] SDSCA scores indicated high levels of medication adherence (5.6 [2.1]), although adherence to general dietary (4.6 [2.1]) and exercise (3.5 [2.2]) recommendations was more problematic.

An exploratory factor analysis of the 43 conversational elements yielded four coherent, meaningful factors (Table 2). Two of these factors related to positive aspects of the diagnosis conversation: "Encouraging" encompassed those elements that were seen by the patient as helpful and reassuring (e.g., "Told me that with good care and effort, odds are good that I can live a long and healthy life with diabetes") (10 items; Cronbach's $\alpha = 0.86$) and "Collaborative" included elements focusing on the sense of a working, action-oriented partnership (e.g., "Helped to make a treatment plan that I could do in my daily life") (12 items; Cronbach's $\alpha = 0.88$). A third factor, "Discouraging", related to negative aspects of the conversation, and centred on elements that were perceived either as apportioning blame for the onset of T2DM (e.g., "Told me that diabetes is mostly my fault, because of the way I had been living my life") and/or bringing bad news about long-term prognosis, even if such comments were valid and realistic (e.g., "Told me that most likely one day I would need to take insulin") (five items; Cronbach's $\alpha = 0.72$). Finally, the fourth factor, "Recommending Other Resources" included those elements where the patient was advised to visit other diabetes-related healthcare professionals and/or programmes (e.g., "Referred me to a dietician, health educator, nurse, or counsellor") (five items; Cronbach's $\alpha = 0.75$).

The stable path model revealed that patient-perceived communication quality was positively associated with the Encouraging ($\beta = +1.764$, $p < 0.001$) and Collaborative ($\beta = +0.347$, $p < 0.001$) factors, was negatively associated with the Discouraging factor ($\beta = -1.181$, $p < 0.001$), and had no significant association with the Recommending Other Resources factor ($\beta = +0.087$, $p = 0.096$) (Fig. 2). Furthermore, better patient-perceived communication quality during the diagnosis conversation was significantly associated with greater current well-being (WHO-5: $\beta = +0.392$), less diabetes-related emotional burden (DDS: $\beta = -0.367$), less regimen-related distress (DDS: $\beta = -0.412$) and better current self-care (SDSCA – exercise: $\beta = +0.702$; general diet: $\beta = +1.093$; specific diet: $\beta = +0.880$; medication taking: $\beta = +0.908$) (all $p < 0.001$) (Fig. 2).

Of note, the conversation elements comprising those factors that were associated with better patient-perceived

Table 1 – Characteristics of the patients (*n* = 3628) who had been prescribed an oral antidiabetes drug at the time of diagnosis, including global mean scores for communication quality and patient-reported outcomes.

	Patients responding (*n* = 3628)
Sex, n (%)	
Male	1738 (48)
Female	1890 (52)
Mean age, years (SD)	50.6 (12.3)
Median duration of diabetes, months (interquartile range)	7 (4–13)
Treating physician, n (%)	
Primary-care physician	1749 (48)
Specialist	1863 (51)
Other healthcare professional	16 (<1)
Communication quality/patient-reported outcomes [range], mean score (SD)	
Patient-perceived communication quality [1–4]	3.2 (0.8)
DDS	
Emotional burden subscale [1–6]	2.5 (1.3)
Regimen-related distress subscale [1–6]	2.5 (1.3)
WHO-5 [0–100]	59.4 (26.1)
SDSCA	
General diet [0–7]	4.6 days (2.1)
Specific diet [0–7]	4.2 days (2.3)
Exercise score [0–7]	3.5 days (2.2)
Medication score [0–7]	5.6 days (2.1)

DDS, Diabetes Distress Scale; SD, standard deviation; SDSCA, Summary of Diabetes Self-Care Activities; WHO-5, WHO-5 Well-being Index.

communication quality (i.e., Encouraging and Collaborative) were recalled by patients more frequently than the conversation elements linked to poor communication quality (i.e., Discouraging) (Fig. 3).

4. Discussion

4.1. *Conclusions*

These findings suggest that how physicians explain and discuss T2DM at diagnosis, including the style as well as the content of that conversation, may have a lasting impact on the attitudes and behaviours of people with T2DM. Previous research has pointed to the importance of the dialogue between physician and patient at the time of the T2DM diagnosis [7], and the current study supports and extends these earlier findings by demonstrating that patients' impressions of the quality of their communication with their physician at diagnosis of T2DM are linked to their current well-being and self-care behaviour. Furthermore, there appear to be key aspects of the physician–patient conversation at diagnosis that may be most critical. In particular, the Encouraging and/or Collaborative factors were associated with better communication quality, while the Discouraging factor was linked to poorer communication quality. In turn, better communication quality, as perceived by the patient, was significantly associated with less current diabetes-related distress, greater current well-being and greater current adherence to diabetes self-care behaviours (Fig. 2).

The theme of the 10 conversational items grouped together through factor analytic procedures as Encouraging was broadly focused on the promulgation of hope that the T2DM diagnosis was not a death sentence. Patients remembered positive messages from their physician such as "more and more people are living long and healthy lives with diabetes" and "if I manage to control my condition, diabetes would not stop me from doing the things I would love to do in the future". The Collaborative dimension was composed of 12 items and focused on physician actions (rather than stated messages) that were seen as supportive and engaging, such as "helped me to make a treatment plan that I could do in my daily life" and "asked me about my goals in caring for my diabetes".

By contrast, the five items comprising the Discouraging factor centred on messages from the physician that were perceived by the patient as being blaming (e.g., "told me that diabetes is mostly my fault, because of the way I had been living my life") or that highlighted likely negative events (e.g., "told me that we may start with just one medication but more medication will be needed eventually").

The results from this study are consistent with the findings from previous multinational surveys that have pointed to the critical value of good physician–patient communication at all stages of diabetes care [29,30]. Efforts at collaboration, in particular, may be of value. In an investigation of 127 pairs of patients and their primary care physicians, Heisler and colleagues [31] found that closer agreement on both overall treatment goals and specific strategies to meet these goals is linked to improved patient outcomes.

In total, these findings suggest that the communication quality of the diagnosis conversation may be enhanced by the greater use of conversation elements that are perceived by patients as Encouraging and/or Collaborative and the use of fewer Discouraging elements; in turn, this could lead to improved patient-reported outcomes. The good news is that Encouraging and Collaborative conversation items were the elements most frequently recalled by patients. Unfortunately, Discouraging conversation elements were still reported by approximately half of the patients surveyed.

Table 2 – Exploratory factor analysis of diagnosis conversation elements revealing four patient-perceived factors on patient-perceived communication quality.[a]

Factor	Conversation element[b]	Factor loading			
		1	2	3	4
Encouraging	Told me that with good care and effort, odds are good that I can live a long and healthy life with diabetes (36)[c]	*0.731*	0.124	0.083	0.096
	Told me that a lot can be done to control my diabetes (22)	*0.670*	0.179	0.125	0.023
	Told me that more and more people are living long and healthy lives with diabetes (40)	*0.647*	0.192	0.150	0.222
	Told me that if I manage to control my condition, diabetes would not stop me from doing the things I would love to do in the future (38)	*0.628*	0.231	0.105	0.181
	Told me that compared to many years ago, managing diabetes these days is much easier because there are many tools available that can help me (41)	*0.627*	0.171	0.152	0.232
	Told me/explained to me what diabetes is (25)	*0.610*	0.249	0.032	0.054
	Told me that what I do on my own can determine whether my diabetes gets better or worse (29)	*0.558*	0.181	0.034	0.118
	Showed me how what I might do to take care of my diabetes could influence my health (6)	*0.549*	0.303	0.107	−0.013
	Encouraged me to ask him/her questions (26)	*0.493*	0.344	0.209	−0.027
	Made me feel satisfied that my care was well organised (5)	*0.477*	0.371	0.191	−0.100
Collaborative	Helped to make a treatment plan that I could do in my daily life (13)	0.287	*0.665*	0.140	0.077
	Helped to plan ahead so I could take care of my diabetes even in hard times (14)	0.217	*0.638*	0.184	0.222
	Helped me generate a plan how to be more active (23)	0.199	*0.636*	0.149	0.156
	Helped me to generate a diet plan (24)	0.254	*0.614*	0.067	0.110
	Thought about my values and my traditions when recommending treatments to me (12)	0.149	*0.599*	0.145	0.236
	Helped to set specific goals to improve my eating and exercise (8)	0.309	*0.587*	0.080	−0.035
	Asked for my ideas when we made a treatment plan (1)	0.124	*0.581*	0.046	0.354
	Asked to talk about my goals in caring for my diabetes (7)	0.192	*0.579*	0.215	0.122
	Asked how diabetes might affect my life (15)	0.281	*0.494*	0.133	0.295
	Gave me choices about treatment to think about (2)	0.191	*0.493*	0.043	0.313
	Gave me a copy of my treatment plan (9)	0.205	*0.457*	0.333	0.073
	Asked how my work, family, or social situation related to taking care of my diabetes (43)	0.260	*0.452*	0.173	0.355
Recommending other resources	Encouraged me to go to a specific group or class to help me cope with diabetes (10)	0.044	0.159	*0.704*	0.168
	Referred me to a dietician, health educator, nurse or counsellor (18)	0.098	0.079	*0.694*	−0.023
	Encouraged me to attend diabetes-related programs in the community that could help me (17)	0.092	0.195	*0.692*	0.200
	Told me how my visits with other types of medical specialists, like the eye doctor, could help my treatment (19)	0.254	0.127	*0.644*	0.090
	Asked how my visits with other doctors were going (20)	0.186	0.272	*0.501*	0.223
Discouraging	Told me that if someday I need to take insulin, it would be my own fault (30)	−0.014	0.173	0.133	*0.708*
	Told me that diabetes is mostly my fault, because of the way I had been living my life (27)	0.018	0.179	−0.029	*0.660*
	Told me that most likely one day I would need to take insulin (21)	0.078	0.144	0.194	*0.645*
	Told me that diabetes gets harder to handle over time (35)	0.140	0.173	0.067	*0.619*
	Told me that we may start with just one medication but more medication will be needed eventually (34)	0.276	0.051	0.229	*0.500*

[a] The factor analysis comprised all patients responding to the survey about the diagnosis conversation ($n = 5904$), including those receiving therapeutic lifestyle modification (diet and exercise) and one oral antidiabetes medication ($n = 3628$) and those receiving therapeutic lifestyle modification only ($n = 2276$). The higher factor loading for each challenge is in italics.

[b] Conversation elements are listed in descending order of magnitude of factor loadings within each extracted factor. The following conversation elements did not load onto any factor: Asked to talk about any concerns with the diabetes medications being prescribed; Gave me a written list of things I should do to improve my health; Asked questions, either directly or on a survey, about my daily routine; Contacted me after the visit to see how things were going; Told me that if I take better care of myself, my diabetes might go away; Told me that diabetes is a disease that needs to be treated very seriously if I want to avoid more serious problems in the future; Told me that diabetes is likely to be permanent rather than temporary; Told me that uncontrolled diabetes could lead to serious long-term complications, like blindness or amputations; Gave me informational materials (e.g., brochures, leaflets, contact details of diabetes associations, internet links) related to diabetes; Told me that having diabetes doesn't mean I have to deprive myself of the foods I love; Gave me a book or monitoring log in which I can record the progress I am making.

[c] Conversation element numbers shown in parentheses are also shown in Fig. 3.

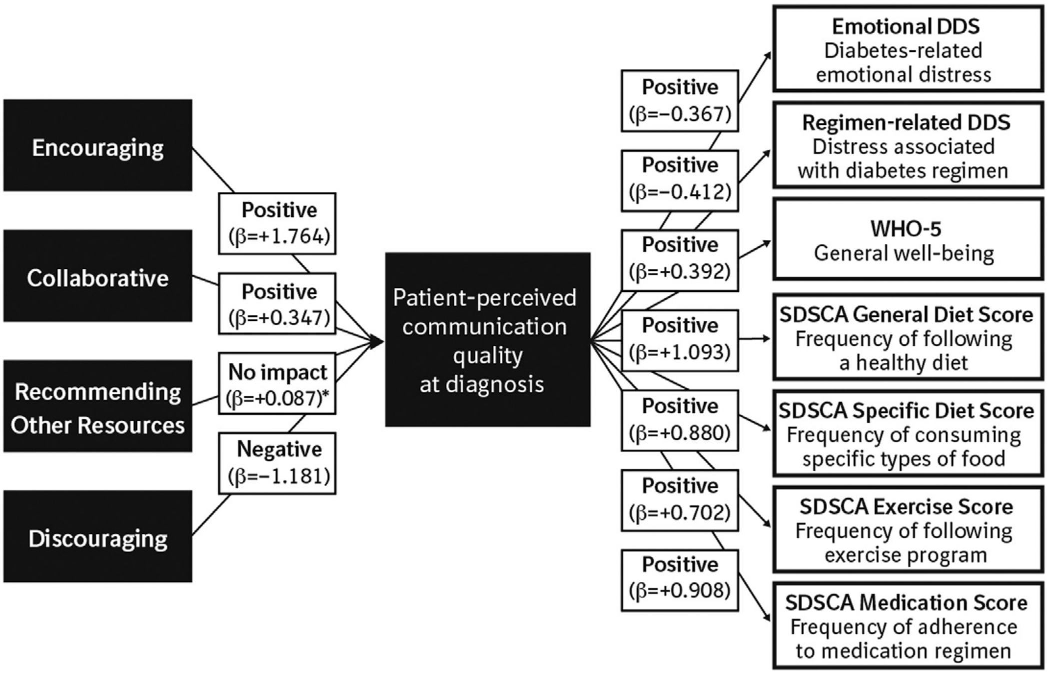

Fig. 2 – Impact of the four patient-perceived factors on patient-perceived communication quality and how, in turn, this affects patient self-reported outcomes. Stable path model calculated in Analysis Of a Moment Structures (AMOS) statistical software. Sample: diagnosis patients receiving one oral antidiabetes medication in addition to any recommended therapeutic lifestyle modifications (*n* = 3628). For DDS outcomes only, a negative β value represents a decrease in distress and therefore a more favourable outcome.*All β values were statistically significant (*p* < 0.001), except for Recommending Other Resources at diagnosis (*p* = 0.096), DDS, Diabetes Distress Scale; SDSCA, Summary of Diabetes Self-Care Activities; WHO-5, WHO-5 Well-being Index.

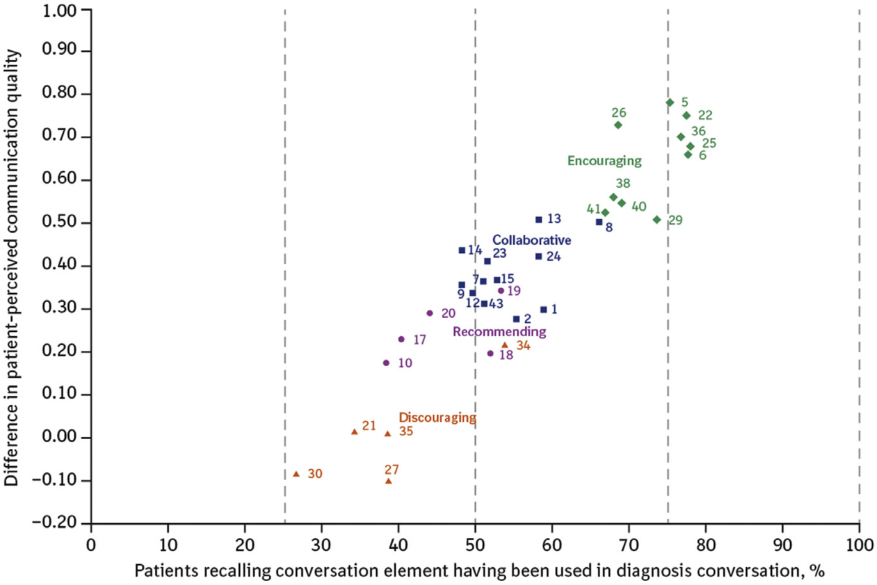

Fig. 3 – Conversation elements (item numbers) in diagnosis conversations: percentage of patients recalling physician use versus difference in patient-perceived communication quality. Data shown are for patients receiving therapeutic lifestyle modification and one oral antidiabetes medication (*n* = 3628). Difference in communication score: number of patients who reported recalling each conversation element minus those who did not recall.

Physicians and patients will likely agree that certain statements are unambiguously encouraging or discouraging, and that physicians should endeavour to recognise and use the former statements more frequently and the latter ones less frequently. However, some statements are more ambiguous. For example, a statement that, from the physician's perspective, is intended to provide the patient with constructive information about the progressive nature of T2DM (e.g., "told me that we may start with just one medication but more medication will be needed eventually") may be viewed very differently by the patient (this is one of the items comprising the Discouraging factor). Hence, physicians should be aware that some of the advice they offer to the patient, however seemingly constructive and neutral it sounds, may be profoundly demotivating to the patient, especially when such negative responses are not recognised and further opportunities for clarification can therefore not occur. From the patient's perspective, physicians must appreciate that when they need to deliver bad news, patients expect high levels of both emotional support and information quality, no matter how bad the news [32].

4.2. *Limitations and strengths*

Key strengths of this analysis are its large sample size (*n* = 3628, across 26 countries) with early T2DM (median duration, 7 months). There are, however, a number of limitations to consider. For example, the retrospective nature of the study means that the associations observed may not necessarily be causal: in particular, it is not clear whether the patient responses at the time of survey accurately reflect what happened at the time of diagnosis, which, for some patients, was potentially up to 5 years earlier. In addition, it is not certain how representative our sample was of the broader population of people with T2DM. Those who chose to participate may have been more motivated, and shown a greater interest in learning about their T2DM, compared with the general population. As such, these patients may have had a more positive perception of the quality of their physician's communication. Also, as was noted in the DAWN Study [29], the majority of countries included in IntroDia® are highly developed, with few less-developed countries, which creates positive bias for all groups (e.g., physicians and patients generally have more resources than in less-developed nations) [29]. Hence, while the Recommending Other Resources factor had no impact on patient-perceived communication quality in the current study, it is not clear whether if taken across a broader sample of people with T2DM from less-developed countries this factor may have had a larger (i.e., significant) influence on communication quality.

Furthermore, it is not clear whether different cultural beliefs and attitudes to the physician–patient relationship between countries may also have influenced overall patient responses. In a study examining communication patterns of doctor–patient consultations in two different cultures (USA and Japan), Ohtaki et al. reported differences in communications between clinic encounters in these countries [33]. In IntroDia® it is possible that in national cultures where, generally, patients felt better able to discuss their T2DM with their physician in an open and proactive manner, these patients have reported a more positive clinic experience in the survey compared with patients from countries where, culturally, the patient has a more passive role in the physician–patient conversation. The results presented here look at the global data; country-specific analyses are currently being assessed.

4.3. *Summary*

In summary, the findings from across the 26 countries surveyed in IntroDia® suggest that patient-perceived communication quality at diagnosis of T2DM, and key elements of that physician–patient conversation, may have an important impact on patient outcomes. Better physician–patient communication at diagnosis may contribute to patients subsequently experiencing greater well-being and more effective disease self-management. Physician–patient communication may be enhanced by physicians using more Collaborative and Encouraging conversation elements and fewer Discouraging ones. Some of these elements will be clearly perceived by both physician and patient as encouraging, collaborative or discouraging. Other conversation elements may, however, be perceived as positive/constructive by the physician but discouraging by the patient. Indeed, in separate analyses of physician-reported data from IntroDia®, key differences between the physicians' perceptions of the conversation elements used in diagnosis conversations and those of patients have been uncovered [34]. Further study to determine how specific statements are perceived in different ways by physician and patient may help to reduce patient discouragement and disengagement at the time of diagnosis.

As mentioned earlier in this paper, IntroDia® is also investigating patient experiences during the "add-on conversation", when an additional oral medication is prescribed following initial OAD monotherapy. The results of this second patient survey will provide insights into how patient-perceived communication quality at "add-on", and elements of that conversation, will affect patient outcomes, at a time when patients are further down the road towards the somewhat inevitable introduction of insulin to manage their T2DM.

The findings reported here, together with data from the physician survey and the patient "add-on" survey, may help to provide strategies or programmes to support physicians and their patients during early treatment of T2DM, encourage positive self-management and improve the quality of diabetes care.

Conflict of Interest

WHP has been a consultant for Abbott, AstraZeneca, Boehringer Ingelheim, Dexcom, Eli Lilly, Intarcia, Novo Nordisk, Roche Pharmaceuticals and Sanofi. MC is a shareholder in RIO Weight Management Ltd, has received research funding from Cambridge Weight Plan, Lighter Life and Novo Nordisk, and has been a consultant and/or paid speaker for Boehringer Ingelheim, Eli Lilly, Janssen, Merck Sharp & Dohme and Novo Nordisk. AB has been a consultant for Abbott, Boehringer Ingelheim, Lifescan Canada and Sanofi on programmes for the International Diabetes Federation. SD has been a consultant for Abbott, AstraZeneca/Bristol-Myers Squibb, Boehringer Ingelheim, Eli Lilly, Johnson & Johnson, Novo Nordisk and Sanofi, and has been a paid speaker for OmniaMed and SB Communications. AA has been a consultant for AstraZeneca, Boehringer Ingelheim, Hikma, Janssen, Merck-Serono and Takeda, and a speaker for AstraZeneca, Boehringer Ingelheim, Novo Nordisk, Hikma, Janssen and Merck-Serono. VG, FN and JL are employees of Boehringer Ingelheim. SE has been a consultant and paid speaker for Boehringer Ingelheim and Eli Lilly.

Author contributions

WHP, MC, AB, SD, FN, JL and SE were involved in the design of the survey, and VG provided the statistical analysis. All authors contributed to the interpretation of the data, and gave input on, reviewed, and approved the final manuscript.

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