Primary Care Physicians' Responses to Treatment Burden in People With Type 2 Diabetes: A Qualitative Video Analysis in China

Kai Lin, MD, PhD[1,2]

Mi Yao, MD, PhD[3]

Lesley Andrew, PhD[4]

Runqi Lin, MD[1]

Rouyan Li, MD[1]

Yilin Chen, MD[1]

Xinxin Ji, MD[1]

Jacques Oosthuizen, PhD[2]

Moira Sim, MBBS[2]

Yongsong Chen, MD, PhD[5]

[1]Family Medicine Centre, The First Affiliated Hospital of Shantou University Medical College, Shantou, China

[2]School of Medical and Health Sciences, Edith Cowan University, Perth, Western Australia

[3]General Practice, Peking University First Hospital, Beijing, China

[4]School of Nursing and Midwifery, Edith Cowan University, Perth, Western Australia

[5]Endocrinology Department, The First Affiliated Hospital of Shantou University Medical College, Shantou, China

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VISUAL ABSTRACT

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CORRESPONDING AUTHORS

Moira Sim
School of Medical and Health Sciences
Edith Cowan University
270 Joondalup Dr
Joondalup WA 6027, Australia
m.sim@ecu.edu.au

Yongsong Chen
The First Affiliated Hospital of Shantou University Medical College
57 Chang Ping Lu
57, Jinping District
Shantou, Guangdong Province, China, 515000
yongsongchen@126.com

ABSTRACT

PURPOSE This study aimed to examine the approaches general practitioners (GPs) use to respond to the treatment burden faced by people with type 2 diabetes.

METHODS We retrospectively analyzed 29 videos of GP-patient consultations in an academic general practice clinic in China. Thematic analysis and a framework matrix approach were used to identify patterns in GPs' responses to the identified issues.

RESULTS The median length of the 29 video-recorded consultations was 23 minutes 54 seconds. We identified 77 segments focusing on discussions about treatment burden. In 37.7% of these segments, the GP elicited and responded to discussions about treatment burden, whereas in 23.4%, the patient initiated the discussion and the GP responded to it, leaving 39.0% in which the patient initiated the discussion but the GP did not respond. In thematic analysis, medication was the component of treatment burden most frequently identified by both patients and GPs, followed by personal resources, medical information, and administrative burden. General practitioners used 12 response approaches to address patients' treatment burden. The most frequently used included active listening and nonverbal skills, shared decision making, and confidence and self-efficacy support, which were broadly applied across various issues. In contrast, GPs typically reserved health record management, motivational interviewing, and awareness of the patient's background for specific issues.

CONCLUSIONS In clinical encounters, GPs used a wide variety of approaches to respond to different aspects of the treatment burden of type 2 diabetes. Our findings emphasize the need to improve GPs' response strategies through increased responsiveness and more rapid surfacing of issues during visits.

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INTRODUCTION

Globally, type 2 diabetes accounts for approximately 90% of diabetes cases among adults.[1] Managing this disease involves complex treatment-associated activities, workload, and costs, all of which impose a substantial burden on individuals,[2] affecting their behavioral, cognitive, physical, and psychosocial health.[3] Current evidence suggests that multiple subconstructs substantially influence the treatment burden in people with type 2 diabetes.[4]

Despite the known impact of treatment burden, current clinical guidelines fall short in addressing the issue.[5] Most existing studies on the treatment burden of type 2 diabetes have been observational, using questionnaires or interviews, with limited discussion on effective strategies for management or response.[6] Additionally, there is a notable lack of relevant research to guide supportive information, especially in primary care and low-resource settings.[7]

In previous work, we developed 2 distinct a priori thematic frameworks, forming the theoretical foundation for managing diabetes treatment burden in China's primary care. The first, the conceptual framework of type 2 diabetes mellitus treatment burden, developed from patient focus groups, has improved comprehension of these burdens in individuals living with the disease.[8] The second, the communication framework of type 2 diabetes mellitus care, encompasses training components of clinical communication for improving care in this population.[9]

We conducted a study that used these frameworks to retrospectively analyze videographic recordings from general practice clinics. The real-world context of

these recordings offers valuable insights into the complex nature of type 2 diabetes treatment burden and explores potential ways in which to improve the response approaches used in primary care settings.

METHODS

Study Design and Ethical Approval

We conducted a cross-sectional observational analysis of video recordings from clinical consultations. A qualitative approach was chosen to analyze consultation practices, treatment burden, and the corresponding responses observed in clinical scenarios.[10,11] This report of the findings adheres to the standards for reporting qualitative research.[12]

Ethical approval for this study was granted by the Human Research Ethics Committee of The First Affiliated Hospital of Shantou University Medical College (Approval No. B-2022 to 238) and the Edith Cowan University Human Research Ethics Committee (REMS No. 2021 to 03129-KA). All procedures performed were in accordance with the ethical standards of the respective institutions, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Data Source

In China, the management of type 2 diabetes in primary care settings follows national standards that are consistent with international guidelines.[13] The videographic recordings analyzed were sourced from an academic general practice clinic within China's primary care system. The data set consisted of 64 videos of consultations between general practitioners (GPs) and patients that took place in 2018 and 2019.

Data Management

The videographic recordings were collected during routine consultations, capturing real-time interactions between GPs and patients. The physicians were primarily junior physicians who had undergone structured training in communication skills, as a component of national GP training standards.[14] Patients were voluntarily enrolled in the clinic, with recruitment occurring during routine visits. All participants provided written informed consent before participating. Both GPs and patients were aware they were being filmed for teaching and research purposes but were not primed to focus on treatment burden during consultations. The recordings were made without disrupting the natural flow of the consultations, providing a reliable and accurate reflection of GPs' daily practice.[10,11]

The videos were included if they met 3 criteria: clear audio and video quality, a primary focus on the patient's type 2 diabetes, and explicit mention of issues related to diabetes treatment burden by the GP and/or the patient. Videos were excluded if the discussions lacked depth, as these interactions could not be reliably analyzed within the framework of this study.

The recordings were securely encrypted and stored on computers designated for teaching and research purposes, accessible only to authorized researchers. Data were anonymized and managed according to institutional protocols. Only information relevant to the study was extracted during the review of individuals' medical records. The consultations in the recordings were primarily conducted in Chinese (Mandarin), with occasional instances of local dialects appearing in 2 recordings. One researcher (K.L.) transcribed the audio of relevant segments. Although transcripts were not returned to participants for correction and feedback, their accuracy was verified by 2 evaluators familiar with the local culture and dialects (R.L. and X.J.), who independently reviewed the transcripts against the recordings.

Participant Characteristics

Characteristics of participating GPs and patients were determined from multiple sources. These included the GPs' residency enrollment data, the patients' medical records obtained through clinical interactions, and consultation observations from the video recordings.

Thematic Analysis

Two experienced qualitative researchers (K.L. and M.Y.) undertook initial video analysis. They watched the videos simultaneously while independently extracting relevant content and taking field notes. The extracted content specifically focused on discussions about type 2 diabetes treatment burden, and the field notes included detailed observations on consultation duration, timing of discussion, and GP-patient interaction dynamics. Additionally, the time spent on each specifically identified segment was recorded.[11] Through a process of cross-referencing and iterative review, video segments were identified and extracted from the recordings. After extracting all video data, researchers (K.L. and M.Y.) conducted a final review and imported the video segments into MAXQDA Analytics Pro 2020 (VERBI GmbH) for further analysis.

The videographic recordings were analyzed using deductive thematic analysis, which involved coding themes and organizing the processes iteratively in a structured manner.[15] Two researchers (K.L. and M.Y.) repeatedly coded the data and scrutinized their findings, engaging in collaborative discussions until mutual agreement was reached on data interpretation (see the Supplemental Appendix for an example of coding).[16] Additionally, 4 researchers (X.J., R.L., R.L., and Y.L.C. [Yilin Chen]), who had not been previously involved with the personnel or medical activities depicted in the videos, independently reviewed the coded material and referred back to the extracted video segments, comparing them with the a priori thematic frameworks to ensure thoroughness and accuracy.[17] This process, ensuring analytic consistency and rigor, included regular peer debriefing sessions and continued until consensus was reached and no new codes emerged.[10,11]

Frameworks and Integrative Matrix
Conceptual Framework of Treatment Burden
We used the a priori conceptual framework of type 2 diabetes mellitus treatment burden[6,8] to identify and categorize

issues from the segments (Supplemental Table 1). Initially, all mentioned treatment burdens in the transcripts were considered unidimensional to ensure a clear correspondence with response approaches. Transcript segments that discussed multiple aspects of burden within the same scenario were duplicated for separate analysis. Each specific issue was then coded separately. This approach facilitated a more precise analysis by connecting each burden to its respective response approaches.

Communication Framework

We used the communication framework established a priori to analyze GP response approaches to treatment burdens. Based on our team's previous work,[9,18,19] this framework includes 19 training components for clinical communication tailored for GPs managing diabetes care. It was developed as part of a primary care initiative to improve care for individuals with this disease. For this study, the framework was calibrated using qualitative data from video analyses to ensure that the communication components were relevant and applicable to GPs' responses to treatment burden. During the calibration, a codebook aligned with the a priori communication framework facilitated thematic analysis. We used the constant comparative method[20] to assess differences between the codes and the original themes of the communication framework. Through team discussions, the themes were refined into contextually relevant descriptions within the video data sets.

We excluded from the analysis instances in which the physician's communication focused on dictating what patients should or should not do (as detailed in the Results section). Previous qualitative studies have shown that such advice-giving approaches, which overlook understanding and addressing the patient's underlying challenges, can inadvertently increase the burden on patients.[8,18] The team concluded that including these GP-patient discussions in the analysis might lead to misleading conclusions.
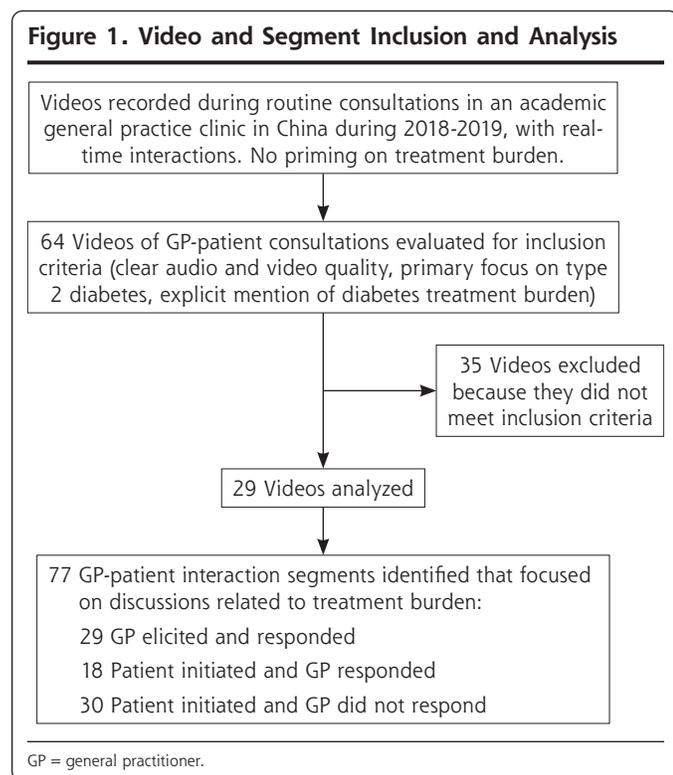
A Matrix Integrating Results

After completing thematic analysis, we used a framework matrix approach to integrate the results of the treatment burden analysis and the GP communication/response approaches analysis.[15,21] All researchers characterized, compared, and grouped the identified issues alongside the response approaches used within a matrix through group meetings. This method facilitated the systematic organization and comparison of the identified treatment burdens with the corresponding GP response strategies. By structuring the data within this matrix, we were able to track the identified patterns, frequency, and context of various response strategies, and summarize the findings in a visual matrix.

Reflexivity and Trustworthiness

The analysis was conducted collaboratively, with all researchers fully aware of how their own backgrounds, beliefs, and biases, as well as those of the video participants, could influence the study.[17] The data analysis team consisted of 6 researchers (3 men and 3 women), all equal in their roles. Two researchers (K.L. and M.Y.), both GPs with PhDs in medical science and trained in qualitative methods, have bilingual backgrounds. The 4 other researchers (X.J., R.L., R.L., and Y.L.C.) are also GPs with extensive experience in primary care research in China.

The 2 researchers primarily responsible for the initial coding (K.L. and M.Y.) achieved greater than 90% agreement on the codes.[11] To ensure consistency and accuracy, all researchers independently reassessed the thematic content, addressing any discrepancies through regular peer debriefing sessions, which included cross-validation of findings. Data saturation was confirmed when no new codes emerged after analyzing 24 transcripts. The findings were translated from Chinese to English by 2 researchers (K.L. and M.Y.), and the translated version was validated through consultations with native English–speaking experts in qualitative research and primary care (L.A., M.S., and J.O.).

RESULTS

Characteristics of Consultations and Participants

Of the initial 64 initial recordings, 35 were excluded because of poor audio or video quality or lack of a primary focus on diabetes, leaving 29 for analysis (Figure 1). Characteristics of the consultations and participants are summarized in Table 1. The median consultation length was

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Figure 1. Video and Segment Inclusion and Analysis

Videos recorded during routine consultations in an academic general practice clinic in China during 2018-2019, with real-time interactions. No priming on treatment burden.

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64 Videos of GP-patient consultations evaluated for inclusion criteria (clear audio and video quality, primary focus on type 2 diabetes, explicit mention of diabetes treatment burden)

↓ →

35 Videos excluded because they did not meet inclusion criteria

↓

29 Videos analyzed

↓

77 GP-patient interaction segments identified that focused on discussions related to treatment burden:

    29 GP elicited and responded

    18 Patient initiated and GP responded

    30 Patient initiated and GP did not respond

GP = general practitioner.

23 minutes 54 seconds (interquartile range = 19 minutes 22 seconds to 28 minutes 58 seconds). We identified 77 GP-patient interaction segments that focused on discussions related to treatment burden, starting at a median of 16 minutes 41 seconds (interquartile range = 13 minutes 47 seconds to 19 minutes 23 seconds) into the consultation. In 37.7% of the segments, the GP elicited and responded to discussions about treatment burden; in 23.4%, the patient initiated the discussion and the GP responded; and in the remaining 39.0%, patients initiated the discussion but received no response from the GP.

Diabetes Treatment Burden Elicited

The result of thematic analysis shows that all key constructs (themes and subthemes) within the conceptual framework of type 2 diabetes mellitus treatment burden[6,8] were mentioned, and related discussions were identified in these recordings (Table 2). Medication was the most discussed issue, mentioned 20 times, making it the top component of treatment burden identified by both patients and GPs. It was followed by personal resources (17 mentions), medical information (15 mentions), administrative burdens (14 mentions), and health care system issues (10 mentions). Lifestyle changes and related factors, such as antecedents and consequences, were mentioned less frequently.

GP Response Approaches to Treatment Burden Issues

The results of the framework matrix analysis are presented in Table 2, linking GPs' response approaches during consultations to specific issues of type 2 diabetes treatment burden.

The analysis indicated that GPs used a range of approaches to respond to the complex nature of treatment burden. Table 2 highlights the frequency of commonly used approaches, which were broadly applied across various treatment burden issues: active listening and nonverbal skills (applied 9 times across 5 themes), shared decision making (7 times across 4 themes), and confidence and self-efficacy support (5 times across 4 themes). In contrast, health record management, motivational interviewing, and patient background awareness were more frequently observed in response to specific issues, such as burdens related to administration, the health care system, or lifestyle changes.

A Calibration of the Response Approaches

On the basis of the a priori communication framework,[9] we calibrated the descriptors to ensure they accurately reflected GP-patient communications in addressing diabetes treatment burden. The themes of active listening and nonverbal skills, which were described separately in the original communication framework, were often used together in practice and were therefore merged into a single theme.

In our thematic analysis of the videotaped interactions, we identified a total of 12 response approaches from the framework that GPs used to address diabetes treatment burden (Table 3). A description of each approach, refined into a

contextually suitable description based on the videographic observations, is given in Supplemental Table 2. Examples of clinical scenarios showing use of the approach along with a summary of the outcome are given in Supplemental Table 3. Most of the approaches corresponded directly to a specific issue of treatment burden discussed.

We excluded from analysis 3 response approaches from the communication framework—behavior negotiation, glucose meter discussion, and medication adherence—as the specific scenarios did not align with the objective of managing treatment burden (Supplemental Table 4). For

Table 1. Characteristics of Consultations, Patients, and GPs

Characteristic	Value
Consultations (N = 29)	
Duration, No. (%)	
< 20 minutes	8 (27.6)
≥20 minutes	21 (72.4)
Duration, median (IQR), min	23.9 (19.4-29.0)
Start of discussion, median (IQR), min	16.7 (13.8-19.4)
Segments on burden (N = 77), No. (%)	
GP elicited and responded	29 (37.7)
Patient initiated and GP responded	18 (23.4)
Patient initiated but GP did not respond	30 (39.0)
Patients (N = 29)	
Gender, No. (%)	
Male	13 (44.8)
Female	16 (55.2)
Age group, No. (%)	
≤54 years	6 (20.7)
55-64 years	14 (48.3)
65-75 years	9 (31.0)
Diabetes treatment, No. (%)	
Oral only	20 (69.0)
Injection only	2 (6.9)
Oral plus injection	5 (17.2)
Lifestyle changes only	2 (6.9)
GPs (N = 11)	
Gender, No. (%)	
Male	4 (36.4)
Female	7 (63.6)
Degree, No. (%)	
Medical bachelor's degree	9 (81.8)
Master's degree or above	2 (18.2)
Time in practice, No. (%)	
1-2 years	7 (63.6)
≥3 years	4 (36.4)
Training in general practice, No. (%)	
1-2 years	10 (90.9)
≥3 years	1 (9.1)

GP = general practitioner; IQR = interquartile range.

instance, physicians often focused on dictating what patients should or should not do, which tended to emphasize patient responsibilities rather than solve the problem collaboratively. This was particularly evident for treatment burden issues related to medical information, administrative tasks, or lifestyle changes.

Another 3 response approaches from the communication framework—complication and risk communication; ideas, concerns, and expectations inquiries; and sharing bad news— were not observed in the videos (**Supplemental Table 4**).

DISCUSSION

Managing the treatment burden of type 2 diabetes is a major challenge in primary care because of factors such as its variable presentation, evolving nature, and lack of definitive measures.[4,8,22] Video-based analyses underscore the complexity of this treatment burden and provide insights into GP-patient interactions.[10] In this study, discussions between GPs and patients primarily focused on themes/issues such as medication burden, personal resources, medical information, and administrative tasks. The qualitative analysis, grounded in

Table 2. Type 2 Diabetes Treatment Burden Themes Mentioned and GP Response Approaches Used (N = 77 Segments)

Theme	Subthemes[a]	Total mentions, No.	Response approaches identified	Total uses, No.
Medication	Management of medications, complexity of medication use, ambivalence toward medication, side effects and hypoglycemia, insulin- or injection-related burden (see **Supplemental Table 1**)	20	Shared decision making	4
			Confidence and self-efficacy support	1
			Active listening and nonverbal skills	1
			Health education	1
			Express empathy	1
Personal resources	Expenses, time, travel	17	Active listening and nonverbal skills	2
			Use examples	1
			Shared decision making	1
			Follow-up and referral	1
			Online and teleconsultation	1
Medical information	Cumbersome medical information, lack of sources of information, biased information	15	Confidence and self-efficacy support	1
			Follow-up and referral	1
			Patient background awareness	1
			Health education	1
Administrative	Periodic examination/monitoring, arranging appointments, documentation and paperwork, glucose meter	14	Health record management	4
			Motivational interviewing	3
			Active listening and nonverbal skills	2
			Confidence and self-efficacy support	1
			Follow-up and referral	1
			Shared decision making	1
Health care system	Health care fragmentation, health care provider, insurance or recourse use, difficulty with health care access	10	Active listening and nonverbal skills	3
			Online and teleconsultation	1
			Health record management	1
			Health education	1
			Use examples	1
Consequences	Interpersonal and social challenges, well-being, quality of life	9	Emotional and psychosocial care	1
			Motivational interviewing	1
			Shared decision making	1
Lifestyle changing	Interruption of lifestyle and daily routines, challenges of health behaviors	7	Patient background awareness	3
			Confidence and self-efficacy support	2
Antecedents	Patient's comorbidities, socioeconomic status	5	Emotional and psychosocial care	1
			Active listening and nonverbal skills	1

GP = general practitioner.

[a] The analytic framework used in this table was developed based on findings from our previous research.[8] The analysis presented here extends and applies the prior work's insights to new data within the scope of the current research.

clinical content, illustrates how the treatment burden framework functions in real-world primary care. By aligning the analysis with framework foundations, our study highlights the dynamics of treatment burden in diabetic individuals and in Chinese general practice clinics.[23]

GPs' Responses to Diabetes Treatment Burden

The variety of response approaches used and their application in clinical scenarios demonstrate GPs' adaptability in tailoring strategies to meet the specific needs of each consultation. The combination of active listening and nonverbal skills was crucial for understanding patient experiences, while cultural awareness was essential for sensitively customizing plans to patients' needs and backgrounds.[24,25] Shared decision making boosts patient engagement and treatment self-efficacy,[26] and health education improves patient understanding of treatment and self-management skills.[27] Online and teleconsultations provided flexible care access, especially valuable for patients with mobility issues and those in remote areas.[28,29] The diversity in approaches used by GPs reflects their commitment and attention to addressing these challenges. Conversely, when addressing lifestyle-related challenges, GPs often adopted a more uniform approach, incorporating awareness of the patient's background and promoting confidence and self-efficacy. This consistency may reflect a consensus on the effectiveness of these methods, adhering to context sensitivity and patient-centered care principles.[30,31]

Optimizing Response Strategies Used by GPs

The consultation times observed, with a median length of 23 minutes 54 seconds, exceeded the typical 2 to 10 minutes in China's community outpatient visits.[32] This extended duration potentially increased financial and time costs for patients, while creating opportunity costs for the health care system.[33] Although extended consultations theoretically allow more

time to address patient concerns, in 39.0% of the 77 analyzed segments, patients initiated discussions about treatment burden but received no response from the GP. Similar findings were reported by Haider et al.[11] This indicates that longer consultations alone may not effectively engage with patients' concerns. The uncertain effectiveness of extended consultations may have further exacerbated these burdens.

Further analysis revealed that discussions of treatment burden typically began a median of 16 minutes 41 seconds into the consultation, with 72.4% of consultations exceeding 20 minutes. This inefficiency in identifying issues could be due to the complexities of treatment burden, time conventions in the academic setting, or inclusion of junior physicians in the study. This finding highlights a paradox in primary care: the need for detailed, patient-centered care must be balanced with consultation efficiency, especially in resource-constrained environments where additional time spent with one patient reduces time available for others.[34]

To better identify and manage treatment burden, it is essential to strike a balance between providing thorough care and managing limited consultation times. The priority in optimizing response strategies should be on maximizing the efficient use of consultation time, rather than simply extending it. Enhancing the ability to quickly recognize different aspects of treatment burden and appropriately match them with response approaches remains a key area for improvement.

Limitations

A key limitation of this study is the longer duration of consultations compared with that in typical primary care settings. The objectives and environment of the academic general practice settings allowed for extended interactions between GPs and patients, which may not reflect the time constraints and faster pace of nonacademic primary care consultations. The inclusion of junior physicians, who may have less clinical experience, limits the generalizability of the findings to broader health care settings, where efficient patient throughput is essential because of high patient volumes and limited GP resources. Additionally, some expected response approaches were not used as anticipated. For instance, motivational interviewing, a technique recently introduced to GPs in China,[35] was primarily used in managing administrative burdens, despite its proven effectiveness in promoting long-term positive lifestyle changes.[36] This limited use highlights the need for further research with more experienced clinicians proficient in updated communication skills, as well as the need to repeat the study in nonacademic settings. Lastly, the retrospective study design provides only a snapshot of GP practices and at a time before the COVID-19 pandemic in 2020, potentially overlooking ongoing changes in health care practices and technologies.

Conclusions

We identified 12 response approaches that GPs use to address various aspects of the treatment burden of type 2 diabetes in the clinic. By integrating the findings from thematic analysis

Table 3. The 12 Response Approaches GPs Used to Address Diabetes Treatment Burden

Response approach	Total uses, No.
Active listening and nonverbal skills	9
Shared decision making	7
Confidence and self-efficacy support	5
Health record management	5
Motivational interviewing	4
Patient background awareness	4
Follow-up and referral	3
Health education	3
Emotional and psychosocial care	2
Online and teleconsultation	2
Use examples	2
Express empathy	1

GP = general practitioner.

with a conceptual framework of treatment burden and a communication framework, our study highlights the adaptability of GPs in managing these complex challenges. It also, however, underscores the need to further optimize GPs' response strategies to improve management of the treatment burden for patients with type 2 diabetes.

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