# Design and Development of Diabetes Communication Skills Training for Chinese General Practitioners (Postprint)

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## Abstract

General practitioners, as health "gatekeepers", play a crucial role in primary care management of diabetes as a chronic disease. Chronic disease management for diabetes can delay disease progression, reduce diabetes-related complications, and improve patient health outcomes, which necessitates effective communication and collaborative partnership between patients and physicians. General practitioners equipped with strong communication skills facilitate the establishment of long-term care relationships with diabetes patients and help patients develop effective self-management skills. This paper summarizes the design and development of a diabetes communication skills training program for general practitioners guided by multiple theoretical frameworks: based on evidence identified through systematic reviews, using qualitative research to further explore communication experiences and perspectives of diabetes patients and general practitioners, and employing a mixed-methods research design to obtain priority rankings from the general practice perspective regarding physician-patient communication training content, aiming to provide solutions for high-quality primary care diabetes management and to offer a reference for designing general practitioner training programs based on evidence and medical education frameworks.

## Full Text

## Preamble

**ChinaXiv Cooperative Journal · General Practice Medical Education Research · Design and Development of Diabetes Communication Skills Training for Chinese General Practitioners**

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**Abstract** General practitioners (GPs) serve as health "gatekeepers" and play a crucial role in chronic disease management of diabetes at the primary care level. Comprehensive diabetes management can delay disease progression, reduce complications, and improve patient outcomes, requiring effective communication and collaboration between patients and physicians. GPs with strong communication skills can establish long-term care relationships with diabetes patients and help them develop effective self-management abilities. This article summarizes our research team's design and development of diabetes communication skills training for GPs guided by multiple theoretical frameworks: using evidence from systematic reviews, exploring communication experiences and perspectives of both diabetes patients and GPs through qualitative research, and employing mixed-methods research to prioritize training content for GP-patient communication. The aim is to provide solutions for high-quality primary diabetes care and offer a model for designing evidence-based GP training programs grounded in medical education frameworks.

[**Key words**] Diabetes mellitus; Communication skills; Inservice training; Training design; General practitioners

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[**Chinese Abstract**] General practitioners, as health "gatekeepers," play an important role in chronic disease management of diabetes at the primary care level. Comprehensive diabetes management can delay disease progression, reduce complications, and improve patient outcomes, which requires effective communication and collaboration between patients and physicians. GPs with good communication skills help establish long-term care relationships with diabetes patients and assist them in developing effective self-management skills. This paper summarizes the design and development of diabetes communication skills training for GPs guided by multiple theoretical frameworks: evidence-based findings from systematic reviews, further exploration of communication experiences and perspectives between diabetes patients and GPs through qualitative research, and mixed-methods research to prioritize training content for patient-doctor communication in general practice. The aim is to provide solutions for high-quality primary diabetes management and offer a reference for designing evidence-based GP training programs using medical education frameworks.

[**Key words**] Diabetes; Communication skills; Inservice training; Training design; General practitioner

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Diabetes is a common chronic disease with high prevalence, mortality, and disease burden, posing a serious threat to public health in China [1–3]. Comprehensive and proactive diabetes management is essential to delay disease progression, reduce complications, and improve patient outcomes. High-quality chronic disease management requires effective communication and collaboration between patients and physicians [4-5], with both parties working together to identify and discuss problems, establish management goals, and develop treatment plans. Through effective communication and collaboration, patients with diabetes can be empowered to actively participate in self-management, while physicians can more timely adjust treatment plans. Numerous cross-sectional studies have demonstrated that good doctor-patient communication can enhance relationships and collaboration, improving health status, medication adherence, self-management, and patient experience and satisfaction. Guidelines from the American Diabetes Association (ADA), European Association for the Study of Diabetes (EASD), and UK's National Institute for Health and Care Excellence (NICE) all encourage patient-centered communication approaches [6-8].

Primary care GPs play a vital role in diabetes chronic disease management. Experience both domestically and internationally shows that a well-trained GP workforce, together with a tiered healthcare delivery system and basic medical institutions, significantly contributes to addressing common chronic diseases like diabetes [8-9]. As health "gatekeepers," GPs provide quality, convenient, and cost-effective medical services to contracted diabetes patients in their com-

munities through comprehensive and continuous management [10]. In recent years, China has vigorously developed GP training programs, aiming to cultivate 700,000 GPs by 2030, achieving a ratio of 5 qualified GPs per 10,000 residents in both urban and rural areas, making GPs the main force in diabetes chronic disease management [11].

GPs with strong communication skills can establish long-term care relationships with diabetes patients, help them develop effective self-management skills, and enhance their confidence, thereby achieving high-quality diabetes management. Communication skills training can help GPs master effective doctor-patient communication methods, rather than relying solely on clinical experience acquired naturally. Previous studies have found that clinicians tend to overestimate their communication abilities, while patients desire better communication with doctors, and physicians' communication skills often decline over time [12]. Research and reviews on doctor-patient communication skills training in China have found that such training is rarely conducted in undergraduate medical education, postgraduate education, or continuing medical education [13]. This article summarizes our research team's work in designing and developing diabetes communication skills training for GPs, aiming to provide solutions for high-quality primary diabetes management and offer a model for designing evidence-based GP training programs using medical education frameworks.

## 1 Theoretical Framework for Diabetes Communication Skills Training

Our team adopted the Complex Interventions Framework, Action Research Theory, and Adult Learning Theory to guide the design and development of diabetes communication skills training for GPs for the following reasons: First, complex interventions typically employ multiple intervention types, involve multi-level target populations, and require corresponding evaluations, making them applicable to healthcare services, health policy, and medical education research. Communication skills training comprises multiple components, including training content, instructor preparation, and training methods, while also addressing multiple outcomes such as learner experiences and impacts on patient health outcomes [14]. Second, action research is a process-oriented approach where researchers actively participate in the entire action process to identify and solve problems, observing the research progress and collecting relevant data throughout, ultimately seeking methods to improve the action. Action research is widely used in healthcare and education, particularly for observing how interventions influence behavior changes in specific contexts. Designing and developing GP communication skills training is an educational activity involving interaction among designers, educators, and learners, requiring multi-party collaboration. Understanding participants' feelings and experiences is crucial for training design, and action research theory enables researchers and participants to collaboratively address various issues in communication skills training through continuous reflection [15]. Third, Adult Learning Theory is guided by constructivism,

which posits that learning is built upon learners' past experiences, knowledge, attitudes, and values. When training Chinese GPs in communication skills, it is essential to consider their previous learning experiences, communication problems encountered with diabetes patients in clinical practice, and the influence of their work environment [16]. Based on these theories, our research team constructed a corresponding theoretical framework and selected appropriate research methods, as shown in Figure 1 [Figure 1: see original paper].

## 2 Research Questions and Methods Under the Theoretical Framework

To design an evidence-based diabetes communication skills training program suitable for GPs, our research team proposed the following core research questions and selected corresponding research methods based on the theoretical framework.

First, what is the existing evidence in the field of diabetes doctor-patient communication training? We addressed this through a systematic review methodology [17]. Second, what are the experiences, perspectives, and needs of both GPs and diabetes patients during communication? We explored this through qualitative research using focus group interviews [18-19]. Third, what feasible training content and methods can be developed for GPs based on the systematic review and qualitative findings? We summarized core training elements [20]. Fourth, how can we prioritize the training content by importance and feasibility? We employed mixed-methods research using the Nominal Group Technique for group decision-making [20].

### 2.1 Evidence on Diabetes Communication Skills Training

Our systematic review included all randomized controlled trials (RCTs) globally related to diabetes communication training to evaluate the impact of communication training for healthcare professionals on diabetes patient health outcomes. The review identified 7,011 articles, and after screening, 19 RCTs were included, comprising 785 healthcare professionals and 21,762 diabetes patients. Most RCTs had high risk of bias in design and implementation. Training content included motivational interviewing, patient-centered communication, cardiovascular risk communication, shared decision-making, and psychosocial communication. Although the review found that communication training for healthcare professionals did not significantly impact primary clinical outcomes (such as HbA1c, blood pressure, lipids, and weight) or secondary outcomes (such as doctor-patient relationship, quality of life, etc.), it identified key success factors: appropriate pedagogical theory, content, teaching methods, and evaluation tools. Based on these findings, our research group concluded that training curriculum design must incorporate the perspectives and needs of both patients and GPs.

### 2.2 GPs' Experiences and Feelings in Communicating with Diabetes Patients

In our qualitative study, we used focus group methodology and purposive sampling to recruit 15 GPs, achieving data saturation. Interview guides explored GPs' feelings and experiences communicating with diabetes patients and their previous communication skills training. Four themes emerged: diversity of diabetes patients, communication with patients, doctor-patient relationship, and communication skills training. GPs face various diabetes patients in clinical practice and noted that lack of diabetes knowledge and misconceptions are common. They described numerous challenges, including brief consultation times, difficulties discussing blood glucose monitoring, and patients' poor understanding of diabetes complication risks. GPs used terms like "blind spots" and "not on the same wavelength" to describe their communication experiences, believing that mutual understanding of diabetes is the best way to enhance doctor-patient relationships. They also recognized the importance of communication skills training but noted that few had received such training.

### 2.3 Diabetes Patients' Experiences and Perspectives in Communicating with GPs

Our research team also used focus groups to collect and analyze diabetes patients' experiences communicating with GPs. Twenty-two patients with type 2 diabetes participated, achieving data saturation. Five themes emerged: understanding of diabetes, diabetes medication, communication with GPs, doctor-patient relationship, and healthcare environment. Patients often obtained information online but could not verify its authenticity. They had multiple needs during GP consultations, including blood glucose monitoring management, medication information, and understanding risks of diabetes complications and cardiovascular disease. Patients perceived communication with GPs as overly simplistic and not addressing their concerns; some were even blamed by GPs for poor adherence. Patients understood communication barriers created by the healthcare environment, such as brief consultation times and lack of coordination between community and hospital care. They hoped to access reliable diabetes information and have more communication channels with GPs.

### 2.4 Core Content for GP Diabetes Communication Skills Training

Based on systematic review and qualitative findings, our research team summarized core elements for GP diabetes communication skills training, defining and explaining each item through literature review. Specific content is presented in Table 1 .

### 2.5 Priority Ranking of Diabetes Communication Skills Training

Using the Nominal Group Technique (NGT) decision-making process, we invited GPs to conduct final group decision-making based on importance and feasibil-

ity. This mixed-methods study involved 58 GPs. First, each participant reviewed research findings and formed initial evaluations. Participants were then assigned to eight nominal groups, guided by facilitators to review individual evaluations and conduct group discussions. After discussion, a second evaluation was conducted, with scores aggregated to obtain quantitative data while discussions were recorded and transcribed for qualitative data. Finally, the research team analyzed and synthesized both qualitative and quantitative data from the decision-making process. Findings revealed that GPs prioritized health education, blood glucose monitoring and interpretation, and diabetes complication and cardiovascular risk communication as the most important training content. Additionally, GPs expressed that communication skills training should be a continuous process integrated with clinical practice with timely feedback. They preferred flexible training methods such as role-playing and case scenarios over traditional lectures. For evaluation, they recommended both immediate and long-term assessments, such as direct observation of behavior changes post-training, clinical practice observations, patient surveys, and assessment of patient health outcomes [27]. These insights will benefit future clinical trial designs to evaluate whether training GPs in communication improves diabetes patient health outcomes.

## Discussion

Doctor-patient communication in diabetes is a complex process occurring across multiple aspects: diabetes prevention, diagnosis, glycemic target setting, behavior change, medication selection and adherence, risk management, complication management, and health education. Risk communication, for example, emerged repeatedly in focus groups with GPs and diabetes patients as an important component. Previous studies have found that diabetes patients in developing countries commonly lack awareness of diabetes-related risks (such as cardiovascular risk), while GPs face many difficulties in communicating risks and providing personalized risk assessments [21-23]. Risk communication itself is a complex process requiring GPs to provide clear, simple information using language and methods patients can understand. Recent studies have used visual graphics as decision aids for risk communication, demonstrating positive effects on disease prevention and treatment when patients understand their risks [24-25]. Risk communication is not completed in a single consultation but may require multiple interactions between doctor and patient over time. For Chinese GPs, training must equip them with appropriate risk communication skills and evaluate subsequent impacts on patient health outcomes.

Diabetes doctor-patient communication is influenced by multiple factors. From qualitative and mixed-methods findings, these can be categorized into three aspects: patient-related factors, GP-related factors, and healthcare environment factors. Patient factors include health literacy, understanding of risks and complications, and emotional-psychological issues. GPs recognize patients' inadequate understanding of diabetes, which is influenced by education level and

sociocultural background. GP-related factors include rushed communication due to time constraints, blaming patients, and using overly technical medical terminology. GPs need to support patients, allowing them time to ask questions and express emotions. Healthcare environment factors include brief consultation times, high patient volumes, and poor care processes and experiences. Without addressing these factors, communication skills training alone will be unlikely to achieve desired outcomes.

Designing and developing communication skills training is a systematic process. A good training program must be evidence-based while considering effectiveness and feasibility. For medical education programs, four basic elements are essential: first, clear objectives; second, meeting learner, patient, and healthcare system needs; third, observable post-intervention outcomes; and fourth, a logical, systematic, and dynamic approach to achieving final goals [26]. For diabetes communication skills training, beyond general communication skills, special attention must be paid to the complexities of GP-diabetes patient communication. Therefore, this study used multiple theoretical frameworks to guide research design, employed qualitative methods to explore experiences of diabetes patients and GPs, and used the Nominal Group Technique to finalize training priorities. Our team also observed that GPs prefer continuous training integrated with clinical practice with timely feedback, favoring flexible methods like role-playing over traditional lectures. Evaluation should include immediate, medium-term, and long-term assessments, such as observing behavior changes post-training, clinical communication practices, patient perceptions, and patient health outcomes [27]. These elements will benefit future clinical trial designs to evaluate whether training GPs in communication improves diabetes patient health outcomes.

This study is the first to explore the design and development of GP diabetes communication skills training guided by multiple theoretical frameworks, using evidence from systematic reviews, qualitative findings on patient and GP experiences, and mixed-methods research to establish training priorities. It highlights the importance of enhancing GP communication skills in diabetes care and provides evidence for designing continuing medical education content that aligns with GP needs and healthcare system demands. This model also offers a scientific research paradigm for exploring GP training to improve management of other chronic diseases at the primary care level. Communication skills training can help GPs master effective doctor-patient communication, facilitating long-term care relationships, helping diabetes patients develop effective self-management skills and confidence, and ultimately achieving high-quality collaborative diabetes management.

**Author Contributions**: YAO Mi conceptualized the article, drafted and revised the manuscript, and takes responsibility for the work. LIN Kai, FAN Jieting, JI Xinxin, WANG Ying, DONG Aimei, HAN Xiaoning, QI Jianguang, and others provided feedback and revisions. Shamil Haroon, Dawn Jackson, KK Cheng, and Richard Lehman contributed ideas and feedback. CHI Chunhua su-

pervised the work, provided guidance and revisions, and takes responsibility for the article.

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*Note: Figure translations are in progress. See original paper for figures.*