

Supplementary Table S1 Periodontal health intervention program

Factors	Time	Theme	Content / Form
Personal characteristics and experience	The first day after joining the group (30–45 minutes)	Personal factors Prior related behaviors	<p>Assess and analyze the patient's personal information, the feasibility of oral treatment, their overall oral health status, and their proficiency in maintaining oral hygiene.</p> <p>A self-designed questionnaire was utilized to assess the periodontal health knowledge, attitudes and behaviors of older patients with T2DM. This tool specifically evaluated their prior understanding, perceptions and practices related to periodontal health.</p> <p>Knowledge training is delivered through PPT lectures and focuses on the following key areas:</p> <p>(1) Basic theoretical knowledge</p> <ol style="list-style-type: none"> Characteristics of periodontal health. The relationship between diabetes mellitus and periodontitis. Identification of periodontitis risk factors, including dental calculus, soft deposits, and plaque. Clinical manifestations of periodontitis Factors affecting periodontal health. <p>(2) Knowledge of oral health behavior</p> <ol style="list-style-type: none"> The negative effects of improper brushing techniques The purpose and benefits of the Bass tooth brushing method. The role and importance of gargling. The advantages of tooth cleaning. <p>Researchers engage actively with patients, explaining disease-related information with patience and attention to detail. During these interactions, patients are encouraged to</p>
Characteristic behavior, cognition and emotion	The next morning, after joining the group (20–30 minutes)	Recognize the benefits of action and improve action-related emotions	

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			<p>participate in discussions, fostering an open and collaborative communication process. At the conclusion of the training, patients are assessed through spontaneous questioning to evaluate their understanding of disease-related knowledge. If any knowledge gaps or unanswered questions are identified, researchers provide immediate explanations or offer targeted education and training to ensure patients achieve a comprehensive understanding and mastery of the required knowledge.</p> <p>Oral health protection skills training incorporates video, oral models, and other tools to provide hands-on demonstrations. These demonstrations include:</p> <ol style="list-style-type: none"> The pap brushing method and the cleaning method for removable dentures (especially for patients with removable dentures). The correct technique for gargling. The proper use of dental floss (with toothpicks recommended for patients with severe gingival retraction or large interdental gaps). Dental exercises. <p>During the training sessions, researchers demonstrated the Pap brushing method, the proper use of dental floss, the correct gargling technique, and dental exercises using an oral model. They also provided patients with videos for review at any time. After the training, patients were asked to provide immediate feedback, enabling researchers to correct the deficiencies and address concerns. Patients were encouraged to evaluate their ability to perform these healthy behaviors independently, and tailored solutions were proposed to address any identified challenges.</p>
	Afternoon of the second day after joining the group (30–45 minutes)	Improve self-efficacy	
	The second and fourth day after joining the group (30–45 minutes)	Recognize the barriers to action	<p>Following the theoretical training, an on-site question and answer session was conducted to assess the patients' understanding and address their concerns.</p> <p>After the skills training, patients demonstrated the procedures they had learned, allowing</p>

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Behavior results			<p>instructors to identify shortcomings and discuss challenges faced during practical application, as well as propose solutions.</p> <p>Upon completion of both theoretical and skills training, researchers re-evaluated the patients' oral cleanliness, identified operational challenges encountered during practice, and tailored individual intervention programs to address these issues.</p>
	The first, third and fifth days of the intervention (30 minutes/time)	Interpersonal influence	<p>Psychological support involves maintaining continuous pay attention to the psychological well-being of patients. This includes conducting one-on-one discussions to listen to their concerns, assess their current mental state, and address any psychological distress.</p>
	Throughout the intervention period	Situational influence	<p>Additionally, efforts should focus on enhancing the social support available to patients and ensuring strong support from medical staff.</p>
	The fifth day after joining the group		<p>Dietary guidance: Provide a list of recommended fruits and advise patients to consume foods rich in protein, vitamins A, C and D to strengthen the resistance of periodontal tissues to pathogenic factors.</p> <p>Daily guidance: Instruct patients on how to properly self-monitor their blood glucose levels and blood pressure to foster positive self-management habits.</p>
	Throughout the intervention period	Strategies to deal with temporary situations	<p>Tailor recommendations to the patient's daily social activities and anticipate potential needs they may encounter, creating a contingency plan. Additionally, develop a clear schedule for patients during hospitalization to prevent conflicts between training and other diagnosis and treatment operations.</p>

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		Promise action plans	<p>Instruct the patient to log into the "Periodontal Health Promotion Action" platform daily to encourage the development of proper periodontal health habits.</p> <p>Follow-up after intervention: During the first week, patients were contacted daily via telephone to assess their progress, confirm whether they followed the oral care regimen, and provide solutions and advice for any challenges they encountered. As patients began to establish habits, the frequency of follow-up calls was reduced to twice a week.</p> <p>The periodontal health sign-in table was reviewed in the fourth week to assess whether the patient had completed the planned periodontal care,</p> <p>In the twelfth week, the outcome index was assessed offline, including the patient's plaque index, simplified oral health index, oral-related quality of life and periodontal condition.</p>