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Breaking the silence: factors influencing complementary therapy disclosure among diabetic outpatients in Taiwan

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Abstract

Background As more patients turn to complementary therapies (CTs) alongside conventional medicine, the lack of communication between patients who use CTs and their conventional healthcare professionals (HCPs) can pose significant risks, including the potential for serious drug interactions.

Purpose To explore the factors influencing the disclosure of CTs use to conventional HCPs.

Methods A cross-sectional survey design was employed to enroll 307 outpatients diagnosed with diabetes from both the northern and southern regions of Taiwan, covering the period from October 2022 to March 2023. The survey questionnaire included demographics, the patterns of CTs use, the experiences of CTs use, the Understanding the Benefit-Risks of CTs Use Scale, and the Diabetes Empowerment Scale. The data were analyzed using IBM SPSS Statistics version 28.0.

Results Only one-third of outpatients with diabetes disclosed their use of CTs to conventional HCPs. Several factors emerged as influential in this disclosure: understanding the benefits and risks of CTs use (OR = 1.10), the reasons for initial CTs use (OR = 1.58), integration of both conventional and complementary medicines (OR = 15.03), and the use of manipulative-based therapies (OR = 6.82).

Conclusion Understanding the factors that influence the disclosure of CTs use is essential for conventional HCPs. This understanding allows them to identify outpatients who may hesitate to disclose their CTs use and ensures they have a comprehensive understanding of their patients' CTs use, thereby facilitating effective communication.

Keywords Diabetes, Complementary and alternative medicine, Disclosure, Comparison

Background

The management of diabetes mellitus is complex, with patients often demanding a combination of conventional medical treatments and complementary therapies (CTs) to achieve optimal outcomes [1]. With the growing emphasis on holistic and patient-centered care, the use of CTs—including herbal remedies, acupuncture, diet modifications, and mind–body practices—has become increasingly common among individuals with diabetes [2, 3]. Reports indicate that 51% of diabetic patients worldwide (ranging from 8 to 93%) use at least one form of CTs alongside their prescribed treatments, particularly

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in Asia, Middle Asia, Africa, and some Western countries [4]. Patients turn to CTs for various reasons, including perceived benefits in improving glycemic control, alleviating symptoms, and enhancing overall well-being [5]. Some individuals seek CTs due to dissatisfaction with conventional treatments, concerns over side effects, or beliefs that natural therapies offer safer, more effective solutions [1]. Additionally, social influences—such as family recommendations, cultural traditions, and exposure to online health information—also play a crucial role in encouraging CT adoption [6]. Despite these motivations, non-disclosure of CT use remains a significant concern in diabetes care.

Research suggests that more than two-thirds of patients, both in Taiwan and globally, frequently fail to disclose their use of CTs to their HCPs [1, 4]. This lack of communication creates a critical gap in clinical decision-making, potentially compromising treatment efficacy and patient safety [7]. The risks of CT non-disclosure include the potential for herb-drug interactions, worsening of symptoms, delays in diagnosis or treatment, harmful side effects, missed opportunities for education and monitoring, and compromised continuity of care [6, 8–10]. For instance, nutritional supplements (e.g., chromium), Chinese herbal medicines (e.g., ginseng, astragalus), non-Chinese herbs (e.g., Cinnamon, fenugreek), aromatherapy (e.g., lavender, peppermint), and diet modifications have been shown to enhance insulin sensitivity and lower blood glucose levels [11, 12]. However, some CTs may interfere with antidiabetic drug absorption and metabolism, increasing the risk of hypoglycemia, liver toxicity, or renal impairment [6, 10]. Similarly, supernatural healings, exercise, mind–body therapies, manipulative-based therapies, and bioelectromagnetic-based therapies could positively influence glucose metabolism, circulation, and stress-induced hyperglycemia [13, 14]. Despite these benefits, CT use may potentiate medication effects, leading to hypoglycemia. Additionally, patients who self-manage their condition with CTs may compromise adherence to prescribed treatments [8].

Given the growing reliance on CTs in diabetes management, low disclosure rates persist due to cultural and healthcare systemic factors unique to Taiwan. Taiwan's healthcare system follows a hierarchical structure, where HCPs are regarded as authoritative figures, and patients are often expected to follow their recommendations with minimal questioning. This power imbalance discourages patients from discussing their CT use for fear of being dismissed, criticized, or misunderstood [15]. In many cases, if an HCP does not explicitly ask about CT use, patients may assume disclosure is unnecessary or even inappropriate. Besides, although Traditional Chinese Medicine (TCM) is deeply embedded in Taiwan's cultural and medical landscape, government policies have historically prioritized Western medicine in healthcare funding and institutional support. This bias is reflected in Taiwan's National Health Insurance (NHI) system, where only 3.7% of total NHI expenditures are allocated to TCM services [16]. This limited insurance coverage reinforces the perception that Western medicine is the"official"or"scientifically validated"approach, making patients more reluctant to discuss their use of non-covered therapies with HCPs. To improve patient-provider communication and ensure the safe integration of CTs into diabetes care, understanding the factors influencing CT disclosure is crucial. Addressing these factors can help develop strategies to foster open patient-provider communication, ensure safe and informed treatment decisions, and enhance healthcare delivery for diabetic outpatients.

Methods

Study design and sample

A cross-sectional survey was conducted in conventional hospitals located in both the Northern and Southern regions of Taiwan from October 2022 to March 2023. A convenience sampling approach was employed, with participants recruited through outpatient clinics. Trained research staff identified eligible participants based on the following criteria: (1) age over 20 years, (2) a diagnosis of diabetes, and (3) use of CTs in the past three months. To enhance the representativeness of the sample, recruitment efforts were conducted across diverse clinical settings on weekdays (Monday to Friday). Participation was voluntary, with assurances of confidentiality and anonymity.

To ascertain the required sample size, G*Power 3.1.9.7 software was utilized, specifically for proportions, focusing on inequality between two independent groups. Based on an odds ratio of 2.63 and a disclosure to non-disclosure ratio of 0.25 from a previous study [17], with a significance level of 0.05 and a power of 0.8, the required sample size was calculated to be 293 individuals. Sensitivity analyses confirmed an acceptable effect size of 0.42 with statistical power ($1—\beta = 0.8$) in this study.

Survey instruments

The survey instrument encompassed various sections focusing on demographic characteristics, patterns of CTs use, and experiences of CTs use based on the previous studies [1, 18] as well as two scales assessing Understanding the Benefits and Risks of Complementary and Alternative Medicine (CAM) Use and Diabetes Empowerment, both of which have been used in previous studies with similar populations in Taiwan. Demographic data collected included age, gender, education level, marital

status, employment status, duration of diabetes, frequency of clinic visits, and HbA1 C levels. The patterns of CTs use included ten specific therapies, as presented in Table 2, which were categorized according to the classifications outlined by the National Center for Complementary and Integrative Health [2] and previous research [1, 18]. Regarding the experiences of CTs use, topics covered included reasons for initiating CTs use, sources of CTs information, knowledge of CT ingredients, decision-makers of CTs use, how to integrate CTs with conventional treatments, and disclosure of CTs use to HCPs.

The 15-item Taiwanese version of the Understanding the Benefits-Risks of Complementary and Alternative Medicine (CAM) Use Scale assesses patients' comprehension of the advantages and risks associated with using CTs. It comprises four dimensions: the patient's medical condition for CAM use, the benefit-risk assessment of CAM use, the suitability of CAM use, and the support from HCPs. Participants responded to each question using a 4-point scale, ranging from "total misunderstanding (1)" to "total understanding (4)." Higher summed scores on the scale correspond to better comprehension of the benefits and risks associated with CTs use. This scale demonstrates good internal consistency ($\alpha = 0.91$ in this study) and has shown acceptable convergent and discriminant validity in prior research involving a Taiwanese diabetic population. Additionally, no significant differences were observed across the demographic variables of gender and age [19].

The 10-item Taiwanese version of the Diabetes Empowerment Scale assesses patients' feelings of control over their diabetes and readiness for change (Shiu et al., 2012). It comprises five dimensions: overcoming barriers, determining suitable methods, achieving goals, obtaining support, and coping. Participants rate their agreement on a 4-point Likert scale, ranging from strongly disagree (1) to strongly agree (4). Higher summed scores indicate increased perceptions of control to self-direct and improve their health. This scale demonstrates good internal consistency ($\alpha = 0.93$ in this study) and has been previously validated in a Taiwanese diabetic population, confirming its reliability and applicability to this study. Additionally, no significant differences were observed across the demographic variables of gender and age [20].

Data collection & ethics

This survey study received approval from the Chang Gung Medical Foundation Research Ethics Committees (No. 202102201B0 C601). Research assistants (RAs) selected potential participants from the appointment list. Upon confirming that individuals met the inclusion criteria, the RAs thoroughly discussed an information and consent form. Prior to participating in the study, individuals provided written informed consent. This ensured that participants were fully aware of the study's purpose and procedures before proceeding with the survey. Subsequently, the RAs conducted structured interviews, diligently documenting all participants' responses on the designated survey instrument.

Statistical analyses

The gathered data underwent a comprehensive review for completeness and was recorded into IBM SPSS Statistics version 28.0 software. Rigorous checks were conducted to verify data accuracy, including identifying and rectifying any outliers or coding errors during data entry. Descriptive statistics summarized the characteristics of the study sample. To compare disclosers and non-disclosers, inferential statistics, including the Chi-square test and independent t-test, were employed. However, due to the requirement that each cell in the Chi-square test have an expected value of at least five, the Fisher's Exact Test was utilized for cells with values less than five [21]. Furthermore, a multiple logistic regression with a stepwise model, incorporating Hosmer–Lemeshow goodness-of-fit tests, was computed to identify factors associated with the disclosure of CTs use to HCPs. The level of statistical significance for all analyses was set at a minimum of $p < 0.05$.

Results

Characteristics of the sample between non-disclosers and disclosers

Table 1 illustrates the characteristics of the sample. The majority of participants were older adults with a minimum of high school education, diagnosed with diabetes for over a decade, predominantly female, married, and either retired or unemployed, attending clinical visits every three months. The disclosure rate of CTs use to conventional HCPs was 30.3%. Comparison of sample characteristics between non-disclosers and disclosers revealed no significant differences in participants' age, gender, marital status, education, employment status, duration of diabetes, and HbA1 C levels. However, a notable difference was observed in the frequency of clinical visits ($\chi^2 = 4.15$, $p = 0.042$). Participants who visited clinics less frequently, specifically less than every three months, were more inclined to disclose their CTs use to their conventional HCPs.

Patients' experiences of CT use between non-disclosers and disclosers

The majority of participants cited personal belief in CTs, either by themselves or influenced by significant others, as the reason for initiating CTs use. Their primary source of CTs information came from various medical

Table 1 Comparisons of demographic and experiences information between non-disclosers and disclosers ($N = 307$)

Characteristics	Non-disclosers		Disclosers		t	*p*
	M	SD	M	SD		
Age	64.81	10.86	64.11	11.34	.52	.606
Duration of diabetes	10.93	8.92	11.85	9.03	-.83	.409
HbA1 C	7.37	1.65	7.56	1.53	-.97	.332
	$N = 214$	%	$N = 93$	%	χ^2	
Gender					0.01	.93
Male	84	39.25	36	38.70		
Female	130	60.75	57	61.30		
Highest Education					0.97	.325
< High school	84	39.25	31	33.33		
≥ High school	130	60.75	62	66.67		
Marriage					0.15	.703
Single	20	9.34	10	10.75		
Being Married	194	90.66	83	89.25		
Employment					0.08	.782
Employed	77	35.98	35	37.63		
Unemployed	137	64.02	58	62.37		
Clinical visits						
≤Monthly	23	10.74	18	19.35	4.15	.042
> Monthly	191	89.26	75	80.65		
The reasons for initial CT use					27.95	.001
Dissatisfaction with medicine	9	4.20	3	3.22		
Beliefs in CT	187	87.38	60	64.51		
Recommend by HCP[a]	18	8.42	30	32.27		
Sources of CT information					22.81	< 001
Non-medical resources	23	10.74	31	33.33		
Medical resources	191	89.26	62	66.67		
Decision makers of CT use					1.88	.171
Own decision	178	83.17	83	89.24		
Others	36	16.83	10	10.76		
Knowledge of CT ingredients					6.50	.011
Known	75	35.04	47	50.53		
Unknown	139	64.96	46	49.47		
Integration of both medicines						
No change or separately taken	213	99.53	90	96.77	1.99	.085
Reduce or stop the medicine[b]	1	0.47	3	3.23		

[a] *HCP* Healthcare professionals

[b] Fisher's exact test

resources such as medical magazines/websites, pharmaceutical stores, or HCPs. However, most participants made their own decisions regarding CTs use, often with limited knowledge about the ingredients of the CTs and without altering their intake of conventional medicine. When comparing the experiences of CTs use between non-disclosers and disclosers, it was noted that participants who initially used CTs recommended by HCPs ($\chi^2 = 27.95$, $p < 0.001$), obtained information about CTs from non-medical sources ($\chi^2 = 22.81$, $p < 0.001$), and had knowledge about CTs ingredients ($\chi^2 = 6.50$, $p < 0.011$) were more inclined to disclose their CTs use to their conventional HCPs.

Patients' patterns of CTs use between non-disclosers and disclosers

When comparing patterns of CTs use between non-disclosers and disclosers, it was observed that participants

Table 2 Comparisons of patterns of CTs use between non-disclosers and disclosers

Types of CT		Non-disclose		Disclose		χ^2	*p*
		n	%	*n*	%		
Nutritional supplements	Non- use	19	8.92	12	12.90	1.13	.288
	Use	194	91.08	81	87.10		
Chinese herbal medicines	Non- use	187	87.38	76	81.72	1.69	.193
	Use	27	12.62	17	18.28		
Exercise	Non- use	185	86.45	71	76.34	4.78	.029
	Use	29	13.55	22	23.66		
Diet modification	Non- use	187	87.38	74	79.56	3.11	.078
	Use	27	12.62	19	20.44		
Supernatural healings	Non- use	197	92.05	83	90.21	0.28	.597
	Use	17	7.95	9	9.79		
Manipulative based therapies	Non- use	205	96.24	80	86.02	10.58	<.001
	Use	8	3.76	13	13.98		
Bioelectromagnetic-based therapies	Non- use	213	99.53	88	95.65	4.641	.030
	Use	1	0.47	4	4.35		
Mind–body therapies	Non- use	213	99.53	86	93.47	8.831	.003
	Use	1	0.47	6	6.53		
Non-Chinese herbs	Non- use	213	99.53	89	96.73	2.751	.083
	Use	1	0.47	3	3.27		
Aromatherapy	Non- use	212	99.06	88	95.65	3.48	.069
	Use	2	0.94	4	4.35		

who used specific CTs, including exercise ($\chi^2 = 4.78$, $p < 0.029$), manipulative-based therapies ($\chi^2 = 10.58$, $p < 0.001$), bioelectromagnetic-based therapies ($\chi^2 = 4.64$, $p < 0.030$), and mind–body therapies ($\chi^2 = 8.83$, $p = 0.003$), were more inclined to disclose their usage to conventional HCPs. Notably, participants who used therapies with potentially higher risks of drug-herb interactions or adverse effects, such as nutritional supplements, Chinese herbal medicines, non-Chinese herbs, diet modifications, and aromatherapy, did not appear to express concern regarding risk management (Table 2).

Patients' understanding and empowerment between non-disclosers and disclosers

The results from Table 3 indicated that participants who disclose CTs use have a higher level of Understanding the Benefits-Risks of CTs use ($t = -11.40$, $p < 0.001$), including five dimensions: the patient's medical condition for CTs use, the benefit-risk assessment of CTs use, the suitability of CTs use, and the support from HCPs. However, no difference was observed in terms of the diabetes empowerment scale between disclosers and non-disclosers ($t = -1.83$, $p = 0.068$).

Factors affecting the disclosure of CTs use

We used a statistical model (multiple logistic regressions with stepwise forward selection) to determine the key factors influencing CT disclosure and confirmed its accuracy using a standard test as the Hosmer & Lemeshow test ($\chi^2 = 6.92$ and $p = 0.437$) indicated the goodness-of-fit of a logistic regression model. The results of Cox & Snell R2 ($R^2 = 0.21$) suggested the likelihood of the fitted logistic regression model, while the Nagelkerke R2 (R2 = 0.29) indicated the proportion of variance explained by the model. Factors influencing the disclosure of CTs use included understanding the benefits and risks of CTs use (OR = 1.10, $p < 0.001$), the reasons for initial CTs use (OR = 1.58, $p < 0.001$), integration of both conventional and complementary medicines (OR = 15.03, $p = 0.023$), and the use of manipulative-based therapies (OR = 6.82, $p = 0.001$). CTs discloser demonstrated better understanding the benefits and risks of CTs use, initiated CTs use based on recommendations from HCPs, integrated both medicines by reducing or discontinuing conventional medicine, and utilized manipulative-based therapies such as massage, Tui-na, Gua-sha, and acupressure (Table 4).

Table 3 Comparisons of scales between non-disclosers and disclosers

Scales	Non-disclosers $n=214$		Disclosers $n=93$		*t*	*p*
Understanding the Benefits-Risks of CAM[a] use						
Patient conditions	10.80	2.32	11.70	2.58	−5.37	<.001
Benefit-risk assessment	12.83	2.83	14.33	2.82	−3.01	.003
Suitability of CAM use	14.63	2.46	15.27	2.70	−4.28	<.001
Support from HCP[b]	4.56	1.32	6.37	1.17	−2.00	.042
Total scale	42.82	7.09	47.67	7.70	−11.40	<.001
Diabetes empowerment scale						
Overcoming barriers	6.08	1.22	6.27	1.30	−1.19	.233
Determining methods	6.18	1.19	6.47	1.20	−1.96	.051
Achieving diabetes goals	6.17	1.24	6.43	1.29	−1.68	.093
Obtaining support	6.15	1.27	6.40	1.23	−1.59	.114
Coping	6.16	1.18	6.32	1.26	−1.06	.288
Total scale	30.75	5.03	31.89	5.02	−1.83	.068

[a] *CAM* Complementary and alternative medicine

[b] *HCP* Healthcare professionals

Table 4 Factors Influencing the disclosure of CTs use to HCPs

Factors	Wald	*p*	Exp(B)	95% CI	
Understanding the Benefits-Risks of CAM use	22.40	.000	1.10	1.07	1.14
The reasons for initial CT use	26.75	.000	1.58	1.33	1.89
Integration of both medicines	5.18	.023	15.03	1.46	154.89
Use of manipulative-based therapies	11.98	.001	6.82	2.30	20.24

Discussion

The findings of this study shed light on the factors influencing the disclosure of CTs use to conventional HCPs in terms of demographics, the patterns of CTs use, the experiences of CTs use, the Understanding the Benefit-Risks of CTs Use Scale, and the Diabetes Empowerment Scale. The disclosure rate (30.3%) observed in our study showed a slight increase compared to that reported in a previous study (24.6%) conducted among the Taiwanese diabetes population [18]. Similarly, our findings align with a global review study [4], which reported a disclosure rate of 33%. The persistently low disclosure rate of CT use to conventional HCPs over the past decade underscores a significant communication gap between patients and HCPs, emphasizing the need for improved dialogue and integration of complementary therapies within conventional care.

Key barriers to disclosure of CT use among patients in our study include dissatisfaction with conventional medicine, reliance on non-medical sources for information, limited knowledge of CT ingredients and safety, infrequent clinical visits, perceived harmlessness of certain CTs, and concerns about judgment or dismissal by HCPs. Notably, participants who used nutritional supplements, Chinese herbal medicines, non-Chinese herbs, and aromatherapy did not express significant concerns about the risks of drug-herb interactions or potential adverse effects. Our findings align somewhat with previous studies [7, 22–24]. Possible reasons for non-disclosure include a lack of awareness about potential herb-drug interactions or the assumption that natural therapies are inherently safe [7, 22]. Some patients may perceive conventional treatments as ineffective, causing side effects, or failing to address holistic well-being [1, 15]. Additionally, less frequent clinical visits can weaken the patient-provider trust relationship, limiting opportunities for open discussions about CT use [22, 24]. Fear of judgment or dismissal by HCPs and reliance on non-medical sources, such as social media or family recommendations, may further discourage disclosure [23].

Understanding the predictors influencing the disclosure of CTs use is crucial for conventional HCPs. This understanding enables them to identify outpatients who intend not to disclose their CTs use and ensures they have a comprehensive understanding of their patients'CTs use. The significant predictors of

disclosure were identified as follows: individuals who integrated both conventional and complementary medicines with a change in intake of conventional medicine were 15.03 times more likely to disclose their CTs use than those who did not change their intake of conventional medicine. Additionally, individuals who utilized manipulative-based therapies were 6.82 times more likely to disclose their CTs use than non-users. Furthermore, individuals who initially used CTs based on HCPs' recommendations were 1.58 times more likely to disclose their CT use compared to those who were dissatisfied with conventional medicine. Finally, individuals who understood the benefits and risks of CTs use were 1.10 times more likely to disclose their CTs use than those with less understanding. These findings diverged somewhat from those reported in the previous studies [5, 25], which identified the following factors influencing nondisclosure, encompassing demographics patient beliefs and attitudes toward the quality of the physician–patient relationship, disease progression, non-inquiry from conventional HCPs, and the specific types of CTs used.

Given that CT disclosure is linked to a greater understanding of its benefits and risks, improving patient education personalized counseling, structured educational programs, and digital interventions is crucial. Particularly, digital patient education platforms, including mobile apps, AI-driven chatbots, and benefit-risk assessment calculators, could help patients evaluate potential CT-drug interactions, provide evidence-based information, and empower them to make informed choices. In addition, HCPs can incorporate decision aids, tailored educational materials, and interactive workshops to address misconceptions and improve disclosure rates. Studies have shown that integrating digital education with in-person counseling enhances patient adherence and disclosure in chronic disease management [26]. Additionally, since patients'initial adoption of CTs is often influenced by family and social networks, community-based education programs could target both patients and their support systems to promote informed decision-making. Equally important is the role of HCP training—ensuring that clinicians are equipped with communication skills, cultural sensitivity, and CT knowledge to create a non-judgmental environment for patient disclosure, for example, integrating brief, structured discussions about CT use into routine diabetes consultations, focusing on patients'motivations for CT use, their understanding of risks, and potential interactions with prescribed treatments [27]. By proactively engaging in these conversations, HCPs can bridge the communication gap and enhance the integration of CTs in diabetes management.

It's crucial to ensure that patients receive accurate and evidence-based information to make informed decisions, as misinformation or misunderstanding could lead to inappropriate CTs use or neglect of conventional treatment [27]. Therefore, understanding these factors empowers conventional HCPs to approach those patients who are hesitant to disclose their use of CTs with caution. By fostering a trusting patient-provider relationship, HCPs can tailor advice, identify potential interactions or adverse effects, and optimize patient care, ultimately ensuring patient safety [5].

Limitations and implications

The limitations of this study included its reliance on self-reported data and the potential for recall bias. To address these concerns, the research team conducted a pilot study to assess the reliability and validity of our survey instruments. Additionally, we minimized the risk of recall bias by implementing shorter recall periods, limiting participants'reporting to experiences and patterns of CTs use within a three-month timeframe. Additionally, the study's cross-sectional design precludes establishing causality or temporal relationships between variables [28]. However, researchers conducted model fit analyses to assess the goodness of fit of the proposed theoretical models to the data. In addition, comparing our findings to existing literature can indeed provide valuable insights and help mitigate the limitations imposed by the cross-sectional design. By synthesizing our results with previous research, we can identify consistent patterns or trends across studies, which can support more robust causal inferences.

Despite these limitations, our findings hold significant implications for clinical practice. First, patients with a greater understanding of the benefits and risks of complementary and alternative medicine (CAM) use were more likely to disclose CT use which suggests that patient education plays a critical role in fostering transparency between patients and HCPs**.** HCPs should implement targeted educational interventions that improve patients' comprehension of the potential advantages and risks associated with CTs, thereby encouraging informed discussions. Second, the reasons for initiating CT use significantly influenced disclosure, highlighting the importance of addressing patients'motivations. Many patients may seek CTs due to dissatisfaction with conventional treatment, cultural beliefs, or recommendations from family and social networks. HCPs should proactively inquire about patients'motivations for CT use during consultations and provide evidence-based guidance to ensure the safe integration of CTs with standard medical care. Third, how to integrate both conventional and complementary medicine significantly influenced disclosure, highlighting

the need for an integrative approach within healthcare settings. Policies promoting integrative healthcare models should include standardized screening tools for CT use in electronic health records (EHRs) to ensure systematic documentation, facilitate treatment planning, and enhance patient-provider engagement and shared decision-making. Finally, the type of CT use influenced disclosure behavior. HCPs should be aware of this disparity and encourage disclosure of less visible forms of CTs (e.g., herbal medicine or dietary supplements), which may pose risks of drug interactions or treatment interference.

Conventional HCPs can play a pivotal role in bridging the communication gap regarding integrative healthcare approaches by fostering open and non-judgmental discussions with patients about their use of CTs, thus creating a supportive environment for disclosure. Additionally, efforts to enhance patient education are crucial; educating patients about the importance of disclosing CTs use to conventional HCPs and providing evidence-based information about CTs can empower patients to make informed decisions and optimize outcomes in diabetes management.

Future research could utilize longitudinal designs to explore changes in disclosure patterns and experiences of CTs usage over time. Furthermore, exploring additional factors influencing the disclosure of CTs use, such as cultural beliefs, social support networks, and healthcare system factors, could provide valuable insights into improving communication between patients and HCPs. Evaluating the effectiveness of interventions aimed at improving communication, including educational programs for both patients and providers, as well as the implementation of decision support tools in clinical settings, is essential for promoting informed decision-making and optimizing diabetes management outcomes.

Conclusion

The findings of this study shed light on the communication gap regarding patients'use of CTs in diabetes care, emphasizing the potential risks linked to self-directed decision-making in the absence of medical guidance. There is a clear call for a proactive approach to address these risks and ensure patient safety within healthcare settings. The findings on the predictors of CTs disclosure highlight the need for patient-centered communication strategies by engaging in open and non-judgmental discussions about CTs usage to normalize disclosure and create a trusting environment where patients feel comfortable sharing information. aligns with the principles of patient-centered care and fosters a trusting patient-provider relationship. Additionally, given the strong association between understanding the benefits/risks of CTs and disclosure, educational programs should be integrated into routine diabetes care to inform patients about the safety, efficacy, and potential risks of CTs. Furthermore, standardized screening tools for CT use should be incorporated into electronic health records (EHRs) to ensure that disclosure is systematically documented and considered in treatment planning. Addressing patients'knowledge gaps, motivations, and the role of HCPs and policymakers can enhance transparency in patient-provider interactions, optimize treatment safety, and promote holistic diabetes care.

Abbreviation

CTs Complementary Therapies

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Authors' contributions

HYC conceived and designed the study, performed the research, analyzed the data, and wrote the manuscript.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study protocol and consent forms were reviewed and approved by the Chang Gung Medical Foundation Institutional Review Board (No. 202102201B0). All participants agreed to participate in the study and signed informed consent. All methods were carried out in accordance with relevant guidelines and regulations, such as the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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