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ORIGINAL ARTICLE

Comparison of integrative medicine centers in the USA and Germany: a mixed method study

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Abstract
Purpose Integrative medicine (IM) has received increasing attention since the 1990s, but few studies have explored the key factors of the IM model in health care. This study aimed to describe the IM model in leading centers operating in the USA and Germany.
Methods A 28-item structured survey and semi-structured interviews were conducted in six centers providing integrative medicine in the USA and Germany, and were analyzed using a convergent mixed-method approach.
Results The elements in common across all six centers were the following: (1) involvement of general physicians (GP) in delivering complementary and alternative medicine (CAM) services; (2) requirement for GP or medical referral or recommendation to CAM services; (3) involvement of an integrative physician (IP) as a "gatekeeper"; (4) focus on research, education, and clinical practice; and (5) ongoing academic activities. The key elements differentiating the two countries were the following: (1) level of requirements for GP referral to CAM services; (2) differences in IM service delivery, including treatment modalities used; (3) accessibility of CAM services to patients; (4) interaction between team members and patients; (5) perception of CAM/IM; and (6) perception of patient-centered care. Themes underpinning these elements are the following: cultural aspects in conceptualizing IM health care; communication within IM programs; and resource availability for delivering IM services, which impacts patient engagement and team collaboration in the IM framework.
Conclusions Delivering IM health care requires a model of care that encourages interaction between all stakeholders. Developing a comprehensive conceptual framework to support IM practice is required to facilitate efficient and safe patient care.

Keywords Integrative medicine · Model of care · Complementary and alternative medicine (CAM) · Healthcare systems

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Introduction

An increase in the number of patients seeking complementary and alternative medicine (CAM) treatments has driven CAM regulation, particularly professional licensing and health insurance coverage, within the health-care system [1]. The incorporation of CAM into a country's health-care scheme differs depending on cultural, political, social, and historical contexts. The concept of integrative medicine (IM), incorporating the coordination of conventional medicine and CAM services, first emerged in the USA in 1996 at the University of Arizona [2]. Its origins lay in the social post-modernist movement of

the twentieth century, which emphasized the value of diversity in treatment, individual patient autonomy, and empowerment in clinical decision-making [3].

Studies incorporating CAM in hospital settings are limited. A clear definition of what constitutes an IM system has not been clearly articulated, and few theoretical models for delivering an optimal IM service have been reported [4–6]. The recent literature [7] highlights the need for an IM model, comprising more than the structural cooperation of two types of medical care, with a focus on continual care links for all stakeholders. IM is a social nexus of three stakeholder groups: providers (e.g., health-care professionals (HCPs) and CAM practitioners), regulators (e.g., administrators), and seekers (e.g., patients) [8].

As the USA and Germany are pioneers in establishing IM clinics in Western hospital settings, we aimed to investigate IM programs being offered in these countries and to evaluate the similarities and differences between the centers, to provide guidance on how IM services can be developed.

Participants and methods

Study sites and participants

From the extant literature, we approached eight institutions in Germany and the USA. The centers were selected according to their visibility and experience practicing IM. Three centers each in Germany (TCM Klinik in Bad Kötzting; Complementary and Integrative Medicine (CIM) Research Unit, Charité Hospital; and CIM Department, The Kliniken Essen-Mitte) and the USA (M.D. Anderson Cancer Center, The Dana-Farber Cancer Institute (DFCI), and Memorial Sloan-Kettering Cancer Center (MSKCC)) agreed to participate; two centers did not respond. Four IM centers were located in oncology departments, one in internal medicine, and one in a clinic for psychosomatic medicine and psychotherapy. Recruitment of the centers was via the principal investigator (JV) emailing an invitation to participate to the directors or senior staff members of each center. The study was approved by the University of Sydney Human Research Ethics Committee. Administration of the survey and in-person interviews took place between October and November 2014, at the time of site visits. All participants provided written consent. All interview data were audio recorded and transcribed verbatim. Interviewer/observer reflections were documented after each visit and formed part of the material for analysis.

Study design

We used a convergent mixed-method approach which involved synthesizing quantitative and qualitative techniques to develop a comprehensive understanding of the phenomenon under investigation [9] using structured survey questions and semi-structured interviews (Fig. 1).

The survey was prospectively developed by the research team based on indicators of successful integration and elements of integrative health care derived from the published literature [10, 11]. A total of 28 questions were asked (Table S1), and all responses were coded and counted. Interviews explored factors influencing the structure of the IM services. This was based on the Donabedian model [12], which provides a framework for examining medical services, based on three categories: structure, process, and, outcomes.

In order to better understand the practice of IM, interviews, observations, and field notes were analyzed using thematic analysis. This deducts core themes by comparing coded words, sentences, or paragraphs after evaluating the links between concepts. We conducted the analysis using MAXQDA 11 according to six phases described by Braun and Clarke [13]. The themes (Table 1) were developed through consensus discussion and used for triangulation purposes.

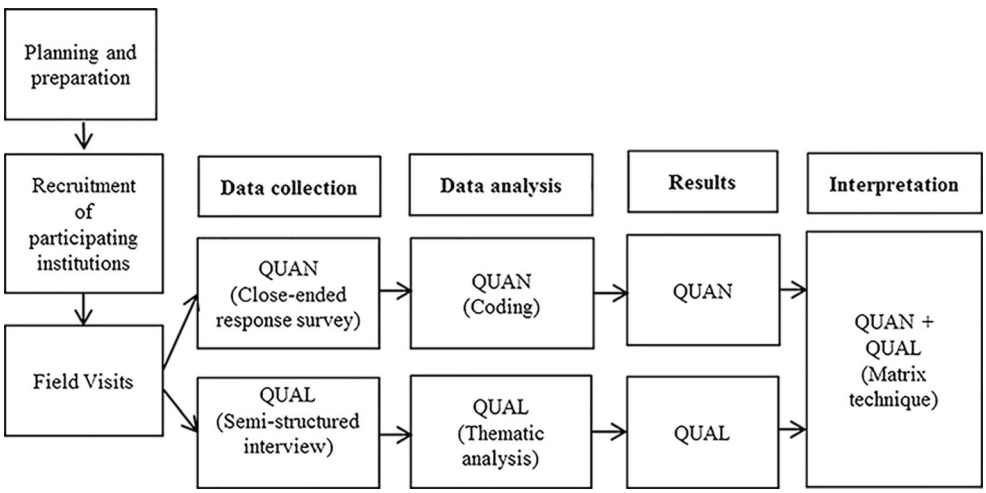

Fig. 1 Flow of the research activities using the convergent mixed-method design. *QUAL* qualitative data, *QUAN* quantitative data

Table 1 Themes that emerged from the interviews

Framework	Categories	Themes
Structure—How is the IM care model organized?	Distinctive feature of IM	Organizational strength
		Acculturation
		Broad and maximized IM support
	Things that should be improved	Increased resources
		Standardization
		Acceptance
	Challenge in running the IM program	Communication
		Funding
		Scientific evidence
Process—How is the IM model conceptualized?	Perception of IM	Cultural context
		Synthesis of two paradigms
		Providers' characteristics
		Teamwork
	Patient-centered care in IM	Component of IM health care
		Patient engagement
Outcome—What happens to the IM model? How could we make it work better?	Satisfaction in being part of IM	Comprehensive approach of treatment
		Clinical contribution
	Element of successful integration	Systematic constraints
		Human components of integration
	Future directions of IM	Expansion of the concept
		Cooperation with patients

IM integrative medicine

Datasets were examined separately and merged using the mixed-method matrix technique [14], and compared to find core themes characterizing the frameworks of IM. We followed the seven phases of the mixed-method analysis process [15] to integrate the two datasets. The results of the surveys from each country were qualitized into narrative codes then compared with the results of the interview data to find the key elements differentiating the IM models between the two countries, as well as the similarities based on the core themes across the six centers. The validity check employed the Good Reporting of a Mixed Methods Study (GRAMMS) quality criteria [16].

Results

The study involved six participating sites. The majority of IM programs were established in the late 1990s. The interviewees were directors, or senior staff members, aged from 40 to 60 years, with experience in IM ranging from 6 to 24 years. Five were involved in direct delivery of CAM services; three had medical degrees and worked as integrated physicians.

Quantitative

Available therapies were categorized according to Tataryn's [17] framework into CAM and conventional medicine, which comprises four medical paradigms: (i) body-mind (e.g., psychotherapy, support groups), (ii) body-energy (e.g., acupuncture, homeopathy), (iii) body (e.g., supplements, exercise), and (iv) body-spirit (e.g., prayer) programs. On average, US centers provided more programs than German centers (average 18 vs. 13), with "body-mind programs" more common in the USA than Germany (46% vs. 29%). The German centers concentrated more on the "body-energy programs" (39%) and "body programs" (32%), compared with 32% and 21% respectively, in US centers (Table 2).

The responses to the survey are outlined in Table S1. In summary, most centers provided centrally coordinated IM services within their respective hospitals. Delivery of services was most commonly by allied health and formally qualified CAM practitioners, and most referrals came from medical staff. All team members, including CAM practitioners, were involved in multi-disciplinary team meetings and ongoing academic activities. Five centers offered inpatient access to CAM services, with one German center exclusively for inpatients. Some centers provided group

Table 2 Number and proportion of integrative medicine programs run in each center (data last updated October 2014)

Center	Number and proportion of programs[d] in each category			Total
	Body and mind[a] *n* (proportion)	Body and energy[b] *n* (proportion)	Body[c] *n* (proportion)	
USA				
1	11 (55%)	6 (30%)	3 (15%)	20
2	8 (53%)	5 (33%)	2 (13%)	15
3	7 (33%)	7 (33%)	7 (33%)	21
Subtotal	26 (46%)	18 (32%)	12 (21%)	56
Germany				
4	4 (36%)	5 (45%)	2 (18%)	11
5	2 (18%)	4 (36%)	5 (45%)	11
6	6 (32%)	7 (37%)	6 (32%)	19
Subtotal	12 (29%)	16 (39%)	13(32%)	41
Total	38 (39%)	34 (35%)	25 (26%)	97

[a] Body-mind—paradigm assumes social support and psychological coping style can influence the formation of health and disease (e.g., psychotherapy, meditation, support groups, relaxation therapies, counseling)

[b] Body-energy—paradigm assumes health and disease are functions of the flow and balance of life energies (e.g., acupuncture, Reiki, and homeopathy)

[c] Body—paradigm assumes biological mechanisms are the primary causative agents of health and disease (e.g., diets, supplements, exercise, and physiotherapy)

[d] Body-Spirit – paradigm assumes transcendental aspects can influence health and disease (e.g. prayer, faith healing), is excluded in this study because the program is organized by separate entities and not included within the scope of their practice

programs for family members or the general public. Most centers billed patients for the IM services, some of which were partially reimbursable from insurers, but five centers offered a limited number of group programs free of charge. Most centers did not have standardized protocols, except those limited to clinical safety guidelines (n = 2), or practical protocols for a few programs only (n = 2).

Qualitative

We identified eight categories, with 21 subthemes, to explain the framework of the IM model, structure, process, and outcome. The themes provide detailed explanations of the interview responses, expressed in the context of the participants' personal experiences and opinions about how IM services should be managed or coordinated (Table 1). A thematic schema illustrating the relationships between themes is provided in Fig. 2. Illustrative quotations are available in Table 3.

The IM model structure at each center was physician driven. CAM practitioners with knowledge of conventional medicine and an evidence-based approach were highly valued. Planning and triaging of IM treatment were the responsibility of conventional medicine physicians. Increased resource allocation, including funding, promotion of the center/programs, research, and education were elements required to improve the structural organization of the model. A positive perception of IM between the medical paradigms and improvements in communication were seen as influencing the IM model organization. A shifting focus to patient-centered care, and practice of integrative health care through patient engagement and team collaboration, was highlighted for future directions of IM.

Comparison between the two countries

The results of the survey and interviews were triangulated and summarized as ten key elements (Table 4). Both countries were similar in the involvement of the physician (e.g., general physician (GP), integrative physician (IP), or oncologist) in IM treatment and the approach to IM promotion and development (elements 1–5). Factors that differentiated the two countries related to the process of service delivery (elements 2, 6–10) derived from different treatment options (Table 4).

HCPs' involvement in IM service delivery While strong structural integration or active networking between departments was evident, the IM team in all centers was led by a chief IP, who had knowledge of or training in CAM, and acted as a gatekeeper. The level of involvement of HCPs differed between the six IM sites. In the German centers, a GP/IP/medical specialist usually delivered IM care. In the US centers, IM was mainly delivered by CAM practitioners. Five centers also involved nurses or AHPs in the provision of IM service. All interviewees regarded the involvement of HCPs in IM as advantageous. In Germany, a doctor's referral was

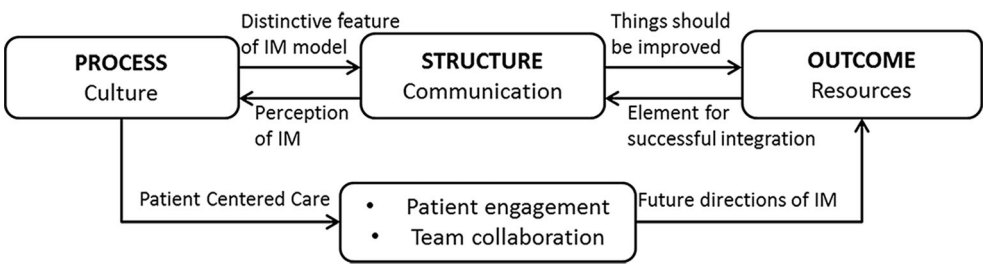

Fig. 2 Thematic schema underpinning the framework of the integrative medicine (IM) model

Table 3 Elements compared between the US and German IM centers and selected illustrative quotations from interview

Elements	Quotations
HCPs' involvement in IM service delivery	"GP referral is compulsory for CAM services and the GP work as an IP," "GP and nurses discuss with patients about CAM treatment, CAM practitioners aren't included in decision making and in round," "GP needs to determine which CAM treatment is necessary." (US center 1) "We have CAM practitioners experienced in both the U.S. and China hospital working in a team, same treatment style and highly educated in both systems, which is important for comprehensive clinical understanding." (US center 2)
	"CAM is delivered by CAM trained GP and having GP delivering CAM is necessary to determine the sequence of treatment, it is our organizational strength." (German center 5)
	"Nurses' role as a facilitator is important to find out patients' needs and they are the primary source for patients to access to CAM services." (German center 6) "We have TCM specialists from China and it is important for good quality CAM treatment." (German center 4)
IM treatment approach/option	"We have wide range of IM services, gives patients more options to treat and it is attractive points for them to choose our centre." (US center 3)
	"We carefully select patients through a thorough examination for suitability for hospitalization to receive IM treatments," "We provide full spectrum and intensive on-wards CAM treatment programs to maximize the quality of treatment." (German center 4)
Accessibility	"Patients don't know we exist. We plan to improve awareness through changing the internal culture so called changing the culture initiatives due to lack of awareness for the HCPs about the importance of the comprehensive approach, we are not visible enough for patients physically." (US center 1)
Interaction	"Break down barrier through education, conference and developing internal standardization of terms will reduce philosophical barrier between western medicine and eastern medicine, the more communicate the less conflict." (US center 2) "Communication serves as an education role for lack of open collaboration with other stake holders," "Due to lack of communication caused by physical invisibility, no time for communication, too many supportive teams and decentralized supportive care centers exist within a hospital." (US center 1)
	"Finding best way of treatment is challenging for me but currently I see only one medical system exist in hospital system in my eyes, and that is biomedicine," "It is important to obtain acceptance from biomedical doctors to strengthen cooperation, and we need more meetings, conferences, working together." (German center 5) "Value in communication is important, mutual respect through sharing knowledge and not being arrogant in attitude is essential," "We weekly tumor board meeting, IP meeting, IP with CAM practitioner meeting, and IM team meeting that all team members are involved." (German center 6)
Perception of IM and patient-centered care	"IM is non-allopathic but use together and it is more than alternative medicine. Complementary medicine is to treat symptom as one of the IM modality to reduce symptoms from the side effect of the cancer treatment. Philosophy in CAM is insignificant in IM. Adjunctive concept of CAM is more receptive to some patients." (US center 3)
	"Optimizing relationship between stakeholders for better communication, activating patients and patient being primary focus care as one of the goal of IM and it is patient-centered care." (German center 5) "We practice 'Empathetic medicine' to interact with patients and to find out their needs." (German center 6)

HCP health-care provider, *GP* general practitioner, *IM* integrative medicine, *CAM* complementary and alternative medicine

compulsory, while in the US centers, it either was compulsory for acupuncture only but recommended for other IM services or encouraged patients to discuss with their primary care provider.

IM treatment approach/option and accessibility All centers provided a comprehensive IM care plan, but German centers had a wider spectrum of IM services, with more intensive scheduling, based on the IM team's assessment of patient

Table 4 Key elements in the differences and similarities between US and German IM sites

No.	Key elements	USA	Germany
1	Involvement of GP in delivering service	GP delivers acupuncture and/or provides consultation for referral	GP delivers CAM service
2	GP referral	Compulsory for acupuncture only or requires recommendation	Compulsory
3	Gatekeeper/main actor	Integrative physician	Integrative physician
4	Comprehensive approach	Research, education, clinical practice	Research, education, clinical practice
5	Academic activities	Active academic activities for stakeholders (HCP and CAM practitioners)	Active academic activities for stakeholders (HCP and CAM practitioners)
6	Treatment options	Body-mind/relaxation programs and various types of CAM including allied health-care programs	Traditional healing therapies and intensive treatment schedule
7	Accessibility	Open to in/out patients and careers	Mostly limited to inpatients
8	Interaction	Academic activities, team meetings (self-regulated participation or via emails)	Academic activities, frequent and regular team meetings (daily and weekly)
9	Perception of IM	Philosophical view and adjunctive care of IM to conventional treatment	Clinical view and parallel practice of IM to conventional treatment
10	Patient-centered care	Component of IM service	Engagement of patients

GP general physician, *HCP* health-care providers, *CAM* complementary and alternative medicine, *IM* integrative medicine

needs and demands. In two German centers, IM service programs were structured around the stage of patients' illnesses, tailoring the frequency and duration of the IM service accordingly.

Five centers reported that the IM services were accessible to inpatients, with the three German centers primarily providing inpatient services. Two German centers comprehensively screened patients, using multi-disciplinary team meetings to evaluate the appropriateness of IM treatment, prior to developing an IM treatment plan. In contrast, the US centers offered IM services mainly to outpatients. The interviews highlighted the limited visibility of IM programs in the hospital, or the wider community, as something that hindered patient access to the services. Increasing awareness of the IM program improved patient access, but was difficult due to limited resources, and GPs' and HCPs' perception of them.

Interaction The survey results indicated active communication and interaction between CAM practitioners and HCPs. However, the interviewees' comments revealed some discrepancies in their experience working within the system. Communication issues were divided into clinical and structural. In clinical issues, language and philosophical barriers emerged. Two interviewees described their experience with traditional Chinese medicine (TCM) specialists trained in both medical paradigms. They believed a comprehensive understanding in clinical practice was needed, and stressed the importance of having a high level of knowledge and clinical experience in both medical paradigms. This helped reduce the philosophical barriers between the two paradigms.

One hospital described difficulties in communication between cross-disciplinary teams and patients due to poorly integrated and decentralized supportive care programs that were spread throughout the hospital as a consequence of opportunistic growth of IM programs. This contributed to limited awareness of the IM program by patients and GPs. While the US centers highlighted the importance of increasing structural centralization, German centers focused more on internal interaction between professionals through active team meetings to discuss patient cases.

Perception of IM and patient-centered care The German centers perceived IM as the application of CAM treatments simultaneously with conventional treatments, with both practitioners working cooperatively and parallel with each other. Conversely, in the US centers, CAM was regarded as a symptom-based treatment adjunctive to conventional medicine. One US interviewee said this approach was more acceptable to US patients and HCPs, with IM not covering the whole paradigm of traditional Asian medicine.

Most interviewees described teamwork as a valuable relationship between the stakeholders, which created better communication and engaged patients in the course of their treatment. Having an open mind, acknowledging the value of CAM, respect, HCPs' acceptance, and cultural contact were considered important characteristics of health practitioners when providing IM health care.

Discussion

This study describes the models of IM services in six centers in the USA and Germany, and the similarities and differences between them. We identified differences in the process of

delivering IM services, including the IM treatment options, interaction between teams and perception of IM, and patient-centered care. US centers focused more on inter-organizational aspects, networking with other departments, and increasing physical visibility to improve program awareness. German centers focused more on intra-organizational aspects, such as structured interaction and collaboration between teams, including building consensus, teamwork, and patient engagement, with the services primarily limited to inpatients. Use of guidelines or treatment protocols and patient treatment planning was limited, though there were informal mechanisms for this in both countries.

Key differences were the structure of interactions between team members, perception of IM, and patient-centered care. The historical and cultural context differed between the countries and may have influenced differences in IM models. For example, Germany has a longer history and wider acceptance of CAM use. Other important differences include health systems, size of the hospitals, and cost or insurance coverage of IM services.

Differences in team interactions between the two countries illuminate differing perceptions of IM, the adjunctive versus a more integrated clinical view of IM. These differences may have influenced the choice and implementation of CAM programs (e.g., body-mind programs vs. body-energy programs).

Existing definitions of "integrative health care" vary from the incorporation of CAM into current practice to development of an entirely new form of medical practice [8]. Coutler [8] and Boon et al. [10] preferred the term "integrative health care" as it acknowledges human health within a broader range of determinants and inter-relationships. Johnson [18] identified 25 definitions of IM from the literature. The key concepts were (1) a focus on patient-centered care, (2) collaboration between health management and treatment, (3) connectivity for consensus and mutual understanding, and (4) encompassing a philosophy that goes beyond inserting CAM into a medical system.

The literature suggests the importance of establishing a conceptual framework able to encompass stakeholder needs in order to develop an optimal IM model. Our study suggests the key to the conceptual framework is "comprehensiveness" in access to IM services and information, in team approach, and in clinical decision-making. A connection linking the stakeholders is a key to developing an optimal IM model.

Communication between CAM and HCPs within the IM team is crucial in IM models. Witt and Gray recommended less hierarchical structures, with a sharing philosophy and common understanding of clearly defined roles pertaining to scope of practice and areas of expertise, to support an IM framework and refer to CAM services, with interaction between teams [19, 20]. Gaboury reported that practitioner behavior and skills were the main factors associated with inter-professional conflicts in IM clinics [21]. In addition, the relationships between health-care professionals, CAM practitioners, and the hospital are important to unite all stakeholders [8].

Delivering IM services requires sophisticated and dynamic interactions between the stakeholders as IM combines two different medical paradigms, while simultaneously seeking a common goal of delivering integrative medical care. Hollenberg claimed that the desired interaction between two medical systems is rarely achieved in IM health-care settings, as the dominant player is the GP, who is responsible for patient referral to CAM services and decision-making [22]. From a social science perspective, with IM as a social and historical construct, the patterns of integration should conceptualize integrative health care from the perspective of the interface, power relations, and dynamics between the key stakeholders [23].

The IM health-care setting is culturally sensitive and encompasses the broader spectrum of services. Any account of practicing integrative health care under the context of one dominant culture may not result in the desired outcome of providing IM health-care services. A broad public health paradigm incorporating supportive care and embracing the concept of integrative health care may be important. Further studies are required on optimizing the relationship between stakeholders, building systematic structures of interaction and communication, and changing the perception of the stakeholders.

There are a number of limitations with our study. Only six centers were evaluated; thus, our data is unlikely to have captured the breadth of models of integration in existence. Consequently, the findings may not be generalizable to other centers due to differences in structure, culture, the participant's role, and the type of hospital department. The data collected were based on a 1–2-day visit to each institution; thus, the results may not represent the comprehensive IM system of each institution. We compared the IM models between six centers and two countries. Each had strengths and weaknesses, but our study was not designed to assess the superiority of one model over the others.

Conclusions

The US and German IM centers evaluated were all highly supportive of the involvement of HCPs and highlighted the importance of research, education, and clinical practice. However, there were differences in interactions between team members, and communication between health professionals and patients, which may have influenced the interviewees' perception of IM and patient-centered care. We recommend integration of a systematic interactive framework to facilitate communication within the IM health-care team, and development of supportive and effective relationships between health professionals and patients, based on an open collaboration between conventional medicine and CAM.

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Compliance with ethical standards

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee.

Informed consent Informed consent was obtained from all individual participants included in the study.

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Conflict of interest The authors declare that they have no conflicts of interest.

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