


# From COVID-19 adversity comes opportunity: teaching an online integrative medicine course

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## ABSTRACT

**Background** We examine the impact of a 5-day online elective course in integrative medicine (IM) taking place during the COVID-19 pandemic, attended by 18 medical students from two faculties of medicine in Israel.

**Methods** The course curriculum addressed effectiveness and safety of IM practices highlighting supportive and palliative care, demonstrated the work of integrative physicians (IPs) in designing patient-tailored treatments and taught practical skills in communication regarding IM. Group discussions were conducted via Zoom with 32 physicians, healthcare practitioners and IM practitioners working in integrative academic, community and hospital-based settings, in Israel, Italy, UK and Germany. An 18-item questionnaire examined student attitudes and perceived acquisition of skills for implementing what was learned in clinical practice. Student narratives were analysed using ATLAS.Ti software for systematic coding, identifying barriers and advantages of the online learning methodology.

**Results** Students reported a better understanding of the benefits of IM for specific outcomes ( $p=0.012$ ) and of potential risks associated with these therapies ( $p=0.048$ ). They also perceived the acquisition of skills related to the IM-focused history ( $p=0.006$ ), learnt to identify effectiveness and safety of IM treatments ( $p=0.001$ ), and internalised the referral to IPs for consultation ( $p=0.001$ ). Student narratives included reflections on the tools provided during the course for assessing effectiveness and safety, enhancing communication with patients, enriching their patient-centred perspective, raising awareness of available therapeutic options, and personal and professional growth.

**Conclusions** Online clinical electives in IM are feasible and can significantly increase students' awareness and modify attitudes towards acquirement of patient-centred perspectives.

## Key messages

### What was already known?

- Many medical schools include courses on integrative medicine (IM), with varied approaches on how to include this subject in the curriculum.
- The COVID-19 pandemic has created significant challenges to clinical education in medical schools, requiring a shift to online teaching.

### What are the new findings?

- Quantitative assessment showed that the online IM course led to a significant shift in the approach to IM and acquisition of IM-related skills, including among IM sceptical students.
- Qualitative analysis identified an enhanced level of patient-centred care and increase in self-reflection on becoming a physician.

### What is their significance?

- The course enabled students to explore their own professional path, with an outward reflection towards the patient, emphasising the patient-centred perspective.
- The course also enabled students to inwardly explore the personal meaningfulness of this search, the 'why' which can then lead to personal and professional growth.



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## INTRODUCTION

An increasing number of medical schools, including those in the USA, have introduced integrative medicine (IM) in their curriculum as a required subject or an elective clerkship.<sup>1,2</sup> Even in countries where traditional/herbal medicine is popular and prevalence of use in the general population is high, students may receive only a few hours on the subject.<sup>3-7</sup> Numerous approaches have been explored regarding how to include IM in the curriculum.

Emphasis has been placed on providing tools needed to evaluate the evidence of effectiveness and safety of IM, specifically in the context of supportive/palliative care and addressing doctor–patient communication on the use of these practices.<sup>8–11</sup> In 2003, the Consortium of Academic Health Centres for Integrative Medicine published curriculum guidelines for teaching IM, emphasising its evidence-based, whole-person and patient-centred approach to ‘make use of both conventional and complementary/alternative approaches’.<sup>12</sup>

IM is part of the curriculum in four of the five faculties of medicine in Israel.<sup>13–15</sup> The Rappaport Faculty of Medicine, The Technion (Israeli institute of Technology), has had a required course in IM since 1998, with the support and endorsement of the faculty’s deans and educators. The course is taught by physicians and healthcare providers under the auspices of the faculty’s Forum of Complementary and Integrative Medicine (FCIM), which was established in 2013. The FCIM is headed by nine senior faculty lecturers, four of whom are clinical associate professors and employed at one of seven affiliated medical centres with IM programmes. The course includes lectures, workshops and student participation in IM-related activities, during both preclinical and clinical years of training. Interested students can attend a week-long elective clerkship, with ‘hands-on’ experience in IM-related therapies in varied clinical settings.

The COVID-19 pandemic has significantly challenged clinical education in medical schools. In Israel, the Ministry of Health suspended all elective clerkship training programmes, including those in integrative medicine (IM). In order to find a solution for the social isolation required by the COVID-19 outbreak, the previous successful IM course was adapted into an online elective course on IM, despite initial concerns that this field might require hands-on teaching as an essential experiential element. The present study evaluated the impact of the course on students’ perceptions, knowledge, attitudes, approach and skills related to IM research and patient-centred communication. Students’ perceptions of the online course as an appropriate and effective setting in which to learn about IM were also assessed as part of the qualitative evaluation of the course.

## METHODS

### Setting, participants and faculty

The online 5-day elective IM course (between 29 March and 2 April 2020) was attended by 18 medical students in their fifth and sixth years of clinical clerkships: 13 from the Rappaport Faculty of Medicine, Technion, Haifa; and 5 from the Faculty of Medicine at the Hebrew University of Jerusalem, Israel. This included six students who had registered for the elective before the COVID-19 outbreak, the others in the week preceding the course.

The faculty included 32 clinicians, of which 23 participated in Zoom lectures, and 27 mentors who met daily online with pairs of students to discuss their own unique integrative clinical setting. Lecturers included 18 integrative physicians (IPs), conventional doctors trained in IM modalities (traditional Chinese medicine, anthroposophical medicine, homeopathy, herbal medicine and hypnosis). Three lecturers were from Italy, Germany and the UK, as were five non-MD integrative practitioners. Mentors were 13 physicians board-certified in internal medicine, family medicine, oncology, paediatrics, pain, psychiatry and neurology; and 14 non-MD practitioners trained in traditional Chinese medicine, manual-movement therapies, mind–body and hypnosis, spiritual care and music therapy.

### Course objectives

The course curriculum was designed to meet the following objectives:

1. Increasing knowledge on the effectiveness and safety of IM in primary, secondary and tertiary levels of supportive and palliative medical care.
2. Increasing awareness about the role of the IP in establishing a patient-centred, evidence-based and patient-tailored IM treatment plan, based on a shared decision-making process with patients and coordinated with the conventional and palliative medical team.
3. Teaching how to search the literature for evidence of the effectiveness/safety of IM modalities, as part of an open and non-judgemental communication process with patients using IM.

### Course design

The design of the course was based on a consensus curriculum among nine members of the FCIM at the Technion. The format and content of the course are presented in [table 1](#). Content was modified daily in accordance with reflections of the students, with an emphasis on logistical barriers (eg, quality of the Zoom media, communication with mentors, time allotted to daily assignments, etc). Each day included four learning modules ([table 2](#)).

### Course assessment

An 18-item questionnaire was developed to assess the course following a literature review of academic courses in IM in Israel and globally.<sup>16–18</sup> A group of four students who had attended an earlier elective (not online) in IM took part in the design of the study tool as well. A preliminary draft was sent to a focus group of four medical educators to refine content and improve clarity. The final draft was given to students attending the online elective at the beginning and end, asking them about their personal use of IM and knowledge, attitudes and IM-related skills acquired during the course (online supplemental appendix 1). The questionnaire

**Table 1** Curriculum for an online elective course in IM: modules and learning objectives

Learning objectives		Approach	Skills and reflections
Module and clinical setting	Knowledge		
<b>Day 1</b>			
Introducing IM modalities: herbal medicine in integrative oncology and palliative care	Core themes, cross-cultural aspects, clinical indications, safety-related issues	Considering clinical effectiveness versus risks (including drug-herb interactions)	How to establish an open and non-judgemental discussion with a patient undergoing chemotherapy
Learning assignments	Individual assignment: viewing video clips (1-hour total): Concepts in traditional herbal medicine, dilemmas associated with herbal medicine use in cancer care, herbal medicine and cancer—an 'alternative' to an 'integrative' medicine model		
	Meeting the integrative mentor (in student pairs), 45 min discussion with IPs		
Introducing IM modalities: mind-body medicine in the surgical setting	Implementing of Western and Eastern mind-body approaches in the preoperative setting	Understanding how mind-body therapy can alleviate both 'physical' and 'psychological' concerns	Experiencing breathing/relaxation techniques
Introducing IM modalities: acupuncture in the hospital setting	TCM concepts of yin-yang and qi, TCM basic science and clinical research	Understanding of the TCM systematic diagnostic approach	Experiencing 'qi' through guided self-acupressure
<b>Day 2</b>			
10 min Zoom-guided group qi gong led by an integrative oncology therapist			
Meet the expert: the IP intake in the supportive care setting	Core issues of the IP consultation: referral, assessment, EBM, shared decision-making, communication with other healthcare practitioners	Exploring the patient's health-belief model and EBM, which are prerequisites of patient-centred care	How to design and assess a patient-tailored treatment programme
Learning assignments	Individual assignment: viewing video clips (1 hour total): How to codesign the integrative oncology treatment programme, integrative oncology in the treatment of gastrointestinal concerns, interview IP on how to combine multidisciplinary integrative treatment plan based on herbal medicine and TCM		
	Meeting the integrative mentor (in student pairs), 45 min discussion with integrative non-MD practitioners		
Introducing IM modalities: touch therapies in the hospital setting	Acquaintance with manual/touch therapies and their clinical indications in surgical and internal medicine wards	Awareness of specific versus non-specific effects in touch therapy	How to assess the manual therapy research design (eg, control groups) and outcomes in clinical studies
Meet the expert: GYN-oncologists and acupuncturists working together in the intraoperative setting	Introducing an integrative GYN-oncology model aimed at facilitating supportive and palliative care	Multidisciplinary teamwork with IO practitioners may facilitate effectiveness and safety	How to establish communication with the IM practitioner in the multi-disciplinary setting
<b>Day 3</b>			
5 min Zoom-guided breathing exercise led by an integrative family physician			
Meet the expert: searching the evidence for effectiveness and safety of IM treatments	Familiarity with IM-friendly medical search engines to assess effectiveness, safety and interactions of dietary supplements	Understanding the need for an ongoing search of the literature for EBM on safety and effectiveness	How to effectively search research data on herbs and supplements in open-access medical search engines
Learning assignments	Individual assignment: viewing video clips (1 hour total): key concepts in traditional herbal medicine; IM in palliative care: cancer-related fatigue, pain, anxiety and insomnia		
	Meeting the integrative mentor (in student pairs), 45 min discussion with paramedical practitioners (eg, nurse and social worker)		
Meet the expert: shiatsu and art therapy in the paediatric haematology setting	Learning the role of touch therapies in improving children's quality of life in supportive cancer care	Assessing the synergistic potential of touch and art therapies via multidisciplinary teamwork	How to establish non-verbal communication with children undergoing life-threatening treatments
International perspective: being an IP in Milan during the COVID-19 epidemic	Discussing the role of IM in an acute medical-social crisis	holistic bio-psycho-social-spiritual perspective may facilitate self-care among both patients and healthcare providers.	Discuss tools for which IM can help physicians during a medical crisis, facilitating resilience and professional growth
<b>Day 4</b>			
10 min Zoom-guided exercise led by an integrative psychiatrician			

Continued

Table 1 Continued			
Learning objectives		Skills and reflections	
Module and clinical setting	Knowledge	Approach	Skills and reflections
Meet the expert: the integrative pain clinic	Specific integrative modalities to consider in pain treatment	The contribution of integrative care in facilitating patient-centred care in patients suffering from pain	How can integrative care extend the biophysical pain perspective, and which practical therapies are effective and safe?
Meet the expert: integrative psychiatry Learning assignments	The role of acupuncture and integrative care in acute and chronic psychiatric conditions Individual assignment: viewing video clips (1 hour total): AM, homeopathy, European herbal medicine Meeting the integrative mentor (in student pairs): 45 min discussion with the integrative mentor in specialised settings (paediatrics, family medicine, oncology, pain, neurology, psychiatry, internal medicine and surgery)	Integrative manual therapies may extend the efficacy of pharmacological and psychological treatment in psychiatric care Non-judgemental listening does not compromise the physician's scientific rigour	'First, do not harm': what are the absolute and relative contraindications to integrative care in psychiatry?
Meet the expert: homeopathy in the family medicine and hospital settings	Exposure to homeopathy practice in family medicine and in preclinical and clinical oncology setting	Non-judgemental listening does not compromise the physician's scientific rigour	How to keep an open yet sceptical approach toward a medical intervention with no known scientific mechanism
Meet the expert: AM in paediatrics and primary care	Philosophical and practical aspects of AM	AM can be integrated in paediatric and primary care, enriching available conventional therapies.	How to facilitate physician-child-parent-teacher communication through AM and its related Waldorf education
Day 5 10 min Zoom-guided meditation led by a spiritual care provider			
Meet the expert: the patient's search for alternative remedies in home and hospital end-of-life care	Learning practical keywords useful to identify undisclosed use of 'alternative' treatments	Patients' use of alternative remedies does not necessarily reflect a rejection of conventional medicine but may suggest unmet needs and concerns which need to be considered by the integrative team	How to communicate with patients expressing an alternative health-belief model of care
Learning assignments	Individual assignment: viewing video clips (90 min total), analysing two patient-physician role-plays aimed at identifying 10 core themes during the initial intake with a patient using herbal medicine during oncology treatment Meeting the integrative mentor (in student pairs): 45 min discussion with the integrative mentor in a specialised setting (internal medicine, family medicine, oncology, psychiatry, paediatrics and surgery)	Meeting the integrative mentor in a specialised setting (internal medicine, family medicine, oncology, psychiatry, paediatrics and surgery)	How to communicate with patients expressing an alternative health-belief model of care
Meet the expert: integration of an inpatient complementary medicine service	Review of integrative care initiatives: 13 hospital departments/units (eg, urology, general surgery, rehabilitation, cardiology, invasive radiology, GYN, haematology, internal medicine and gastroenterology)	Integrative care is relevant in a wide range of medical professions, based on a multidisciplinary approach and open and creative communication with the conventional medical team.	How can I promote an integrative care service in my own practice in the future?
Meet the expert: integrative neurology	IM is useful in many neurological conditions (eg, migraine, multiple sclerosis and pain syndromes).	Students need to consider complementary/complementary medicine use in patients with recurrent and chronic neurological conditions.	How can an integrative perspective enrich palliative pain treatment in patients with debilitating neurological disease?
International perspective of IPs: (Germany, UK, Italy and Israel)	Integrative care has a significant therapeutic role in each of these three levels of care. However, fragmentation of care (as opposed to continuity of care) is a major concern.	Students are expected to identify barriers obstructing continuity of care, especially between ambulatory and hospital.	How can IM prioritise continuity of care despite fragmentation of treatment between medical settings and professions?
Establishing an integrative continuity of care: from primary to secondary and tertiary levels of care			

AM, anthroposophical medicine; EBM, evidence-based medicine; IM, integrative medicine; IO, integrative oncology; IP, integrative physician; TCM, traditional Chinese medicine.

**Table 2** The four IM curriculum learning modules

Core module	Major aspects	Sub-themes
Introduction	IM modalities in specific IM clinical settings	Herbal medicine in integrative oncology; mind–body medicine in the surgical setting; acupuncture and touch-manual therapies in the hospital setting
Meeting with the IM expert	Exploring core issues in daily IM practice	Supportive cancer care; palliative care; gynecological–oncology intraoperative setting; internal medicine; paediatric haemato-oncology; pain clinics; inpatient psychiatry department; neurology; family medicine and paediatrics
Daily learning assignments	Viewing a MOOC titled ‘Traditional herbal medicine in supportive cancer care: from alternative to integrative’ Individual skill-related tasks  Online meetings of student pairs with physician and non-physician IM mentors	Viewing between five and six designated video clips (1 hour in total) daily; the MOOC was launched in 2019 on the Coursera platform, in collaboration with the Technion Institute of Technology.*  For example, exercise on how to search the scientific literature for information on herbal products, primarily with respect to effectiveness, and in addition, students were required to analyse two patient–physician simulated interactions, identifying 10 core themes during the initial intake with patients using herbal supplements during oncology treatment.  Meetings were conducted via digital media (eg, Skype, WhatsApp video and Zoom) for a 45 min daily discussion, with each pair interviewing five different mentors during the course. During the meetings, the student pairs heard about the integrative clinical setting in which the mentor is working and how they are able to implement integration in their daily practice, and discuss a patient case from the mentor’s practice and the role of IM in their care, with an emphasis on implementing these treatments in a conventional medical setting.
International perspectives	Learning about international initiatives in IM	The discussion focused on the implications of the COVID-19 epidemic on implementing IM in an integrative framework. The session also addressed maintaining continuity of care in IM, this from primary, secondary and tertiary levels of care.

\*MOOC reference: <https://www.coursera.org/learn/cancer-medicine-alternative-herbal-asia> Accessed: 13 April 2020.

IM, integrative medicine; MOOC, massive open online course.

contained 16 items to be scored using a Likert-like scale (from 1 to 10), and two open-ended questions asking for reflections and narratives.

Baseline characteristics were assessed for all 18 students prior to the beginning of the course. Based on their response to three precourse questions, the cohort was divided into two subgroups: ‘IM supporting’ and ‘IM sceptical’. Students were considered to be ‘supporters’ if they fulfilled at least two of the following: registering prior to the COVID-19 outbreak, a high score (6–7 of 10) on the question on the effectiveness of IM; and a low score (1–2/10) for perceived risks of IM treatments.

#### Statistical analysis

Quantitative and qualitative variables were tested to evaluate equal distribution between the two subgroups. t-Tests were performed to compare normally distributed variables and Mann-Whitney tests for variables that did not distribute normally. Independent  $\chi^2$  and Fisher exact tests were used to compare qualitative variables between the two subgroups. Precourse and postcourse scores were compared with a Wilcoxon test performed for each question. The results were divided into three groupings: sceptical towards IM, IM supporters and a group with both.

The multivariate analysis included two dependent variables derived from the variation between ratings (precourse and postcourse) regarding the effectiveness of IM and associated risks. A

Kolmogorov-Smirnov test found both dependent variables to have Poisson distribution.

Both dependent variables were compared with all of the independent variables. Mann-Whitney tests compared dependent variables that did not distribute normally with dichotomous variables. A Spearman correlation test was performed comparing dependent variables with independent quantitative variables.

Following the distribution of dependent variables, two multivariate Poisson regression modules were designed to describe the relationship between dependent and independent variables. These modules included significant variables from the previous step and/or other important variables for research. All comparisons were two-sided, with a p value of <0.05 considered statistically significant. Data were collected using an Excel spreadsheet (Microsoft V.2010) and analysed using SPSS software V.22.0.

Qualitative analysis of students’ narratives (precourse and postcourse) focused on free-text narratives from the last two questions of the study tool and was coded systematically using ATLAS.ti Scientific Software V.8. To avoid the need for pre-established categories for coding, a qualitative content analysis was performed using a conventional content analysis approach.<sup>19</sup>

#### RESULTS

Of the 18 students participating in the elective online IM course, 16 completed the study

## Education

**Table 3** Comparison of precourse and postcourse attitudes and assessment of perceived skills acquired (univariate analysis)

Theme, median (min, max)	IM sceptical	P value	IM supporting	P value	Both	P value
<b>Approach</b>						
Can complementary medicine improve patients' medical condition?	6 (4, 7) 6 (5, 7)	0.257	6 (3, 7) 7 (5, 7)	0.317	6 (3, 7) 6 (5, 7)	0.131
Can complementary medicine result in harmful effects on patients?	4 (2, 6) 5 (2, 6)	0.48	2 (1, 3) 3 (2, 7)	0.066	3 (1, 6) 4 (2, 7)	0.048
Extent of published IM-related RCTs	3 (2, 5) 4 (1, 6)	0.558	3 (2, 3) 4 (3, 6)	0.026	3 (2, 5) 4 (1, 6)	0.031
Does IM clinical outcome have a specific effect?	4 (3, 6) 5 (4, 6)	0.052	5 (3, 6) 5 (4, 7)	0.102	4 (3, 6) 5 (4, 7)	0.012
Does IM clinical outcome have a non-specific (placebo) effect?	4 (3, 5) 3 (3, 5)	0.408	4 (2, 5) 3 (2, 5)	0.414	4 (2, 5) 3 (2, 5)	0.248
Need for further research	5 (3, 6) 5 (3, 6)	0.492	5 (2, 6) 4 (3, 7)	0.492	5 (2, 6) 4.5 (3, 7)	0.38
IM safety in cases where no adverse effects were reported in RCT	4 (3, 6) 6 (3, 7)	0.142	5 (3, 6) 5 (2, 6)	0.785	5 (3, 6) 5.5 (2, 7)	0.184
<b>Skills</b>						
History-taking (anamnesis) on IM use	2 (1, 5) 5 (1, 7)	0.063	3 (1, 5) 5 (4, 6)	0.026	2.5 (1, 5) 5 (1, 7)	0.006
Dealing with a patient who has an 'alternative' concept of care	3 (1, 6) 5 (1, 6)	0.121	3 (1, 6) 5 (3, 7)	0.105	3 (1, 6) 5 (1, 7)	0.024
Referring a patient in an informed manner to IM treatments	1 (1, 5) 5 (3, 7)	0.011	1 (1, 6) 5 (4, 6)	0.026	1 (1, 6) 5 (3, 7)	0.001
Codefining with the patient 'realistic' versus 'non-realistic' treatment goals	3 (1, 6) 6 (3, 7)	0.02	2 (1, 6) 5 (3, 6)	0.04	2 (1, 6) 5 (3, 7)	0.002
Evaluating the effectiveness of the IM treatment	2 (1, 5) 5 (4, 6)	0.012	3 (1, 4) 6 (3, 6)	0.016	2.5 (1, 5) 5 (3, 6)	<b>0.001</b>
Evaluating the safety and/or risks of the IM treatment	2 (1, 4) 6 (3, 6)	<b>0.011</b>	3 (1, 5) 6 (4, 7)	<b>0.018</b>	2.5 (1, 5) 6 (3, 7)	<b>0.001</b>
Designing a treatment plan in IM	1 (1, 4) 3 (1, 5)	<b>0.042</b>	1 (1, 5) 4 (2, 5)	<b>0.040</b>	1 (1, 5) 3.5 (1, 5)	<b>0.005</b>
Working in a multidisciplinary team with non-MD IM practitioners	2 (1, 5) 6 (3, 7)	<b>0.016</b>	2 (1, 5) 5 (5, 7)	<b>0.027</b>	2 (1, 5) 5 (3, 7)	<b>0.001</b>
Follow-up assessment of the safety and effectiveness and of the IM treatments	2 (1, 5) 5 (2, 6)	<b>0.031</b>	3 (1, 5) 5 (4, 6)	<b>0.046</b>	2 (1, 5) 5 (2, 6)	<b>0.003</b>

IM, integrative medicine; RCT, randomised controlled trial.

questionnaire at both the beginning and end of the programme (88.8% response rate). The mean age of the final cohort was  $29.06 \pm 5.21$  years, of which more than two-thirds (11, 69%) were female. Most were native Hebrew speakers (13, 81%); more than half reported prior or current use of IM (9, 56%); and only few underwent any IM-related training (2, 12%). There were seven students in the IM supporting subgroup and nine in the IM sceptical subgroup. Both had similar baseline characteristics and reported comparable IM-related knowledge, attitudes and skills.

### Quantitative assessment

Precourse and postcourse assessments are presented in table 3. Scores increased significantly regarding the potential for IM-associated risks (median from 3 to 4,  $p=0.048$ ) and extent of publication of IM-related randomised controlled trials (median from 3 to 4,  $p=0.031$ ). At the end of the course, scores also increased regarding specific benefits of IM for

chemotherapy-induced nausea (median from 4 to 5,  $p=0.012$ ), with no change regarding placebo/non-specific effects ( $p=0.248$ ). Self-perceived levels of skill increased for the ability to take an IM-focused history (median from 2.5 to 5.0,  $p=0.006$ ); to cope with a patient's 'alternative' health-belief model (median from 3 to 5,  $p=0.024$ ); to assess the effectiveness (median from 2.5 to 5.0,  $p=0.001$ ) and safety of IM treatments (median from 2.5 to 6.0,  $p=0.001$ ); and to internalise the importance of referring patients to IP consultations and IM treatments (median from 1 to 5,  $p=0.001$ ). Students in the IM sceptical subgroup reported a higher perceived level of competence in assessing effectiveness ( $p=0.012$ ) and safety ( $p=0.011$ ) of IM, and in referring patients to the IP consultation and IM treatments ( $p=0.011$ ).

Multivariate analysis examining attitudes to the effectiveness of IM did not find any significant relationship with previous IM use or training, gender or baseline perceptions regarding IM-associated risks.

**Table 4** Multivariate analysis: predicting variables of change in perception regarding IM safety-related issues

Variables	RR	95% CI of RR	P value
Complementary medicine/IM previous treatment	0.461	0.219 to 0.971	<b>0.042</b>
Age	1.042	0.974 to 1.115	0.233
Gender	0.426	0.189 to 0.959	<b>0.039</b>
IM training	0.330	0.098 to 1.106	0.072
IM attributed safety	1.315	0.926 to 1.868	0.126

IM, integrative medicine; RR, relative risk.

Further multivariate analysis examined attitudes regarding IM-associated risks, showing that men and students reporting prior/current use of IM have more than a 50% lower tendency to change their attitudes towards these risks (see [table 4](#)).

#### Qualitative assessment

Qualitative analysis of the narratives identified three main themes: the online teaching format, patient-centred insights and students' self-reflection on becoming a physician.

#### Online teaching format

While most students did not have any previous experience with online elective courses, the vast majority expressed a positive attitude to the present format, with Zoom meetings and online discussions with mentors. One student emphasised the caring approach of the instructors: 'Less presentations, more conversations, more eye contact, more practical exercises. All of these improved the course... from very good to excellent and personal'. Frontal lectures were perceived as 'outdated', with a preference for 'personal face-to-face' encounters with teachers.

The online course was described as an opportunity for opening new learning horizons:

I believe that just like medical care can be given from afar in certain circumstances, so too can medical education be given from afar. The current crisis can open new horizons for education in general.

Students enjoyed the shared learning group experience and were especially impressed by the geographical accessibility: 'overcoming the gaps in space and time'.

A number of limitations were mentioned, some due to the COVID-19 pandemic. These included distractions from children who were also at home and the need to comply with social isolation restrictions. For many, the Zoom discussions lasted too long, requiring frequent 'time outs'.

Students felt that the most limiting aspect of the course was the absence of direct human contact, especially with patients. The lack of hands-on experience with IM modalities was practised to

a limited extent, though students did experience qi-gong and tai-qi exercises, self-acupressure, and meditation and guided-imagery during Zoom-mediated interactions.

#### Patient-centred insights

Course participants emphasised the importance of the knowledge gained in improving communication with patients about IM:

We as future doctors have an obligation to at least become familiar with the subject, even if we don't actually practice it.

This knowledge was associated with the perceived level of skills for effectively integrating questions on IM during history-taking, and the importance of referring patients to an IP consultation:

The main challenge is, without a doubt, to include these questions in the patient's history, and to know what to do with the answers I receive.

The new knowledge and perceived skills acquired would be used to enhance treatment of patients, as suggested in the following narrative:

Two weeks ago a patient came to the emergency room where I work, suffering from newly diagnosed nephrotic syndrome. She mentioned that she had been taking Saffron to relieve anxiety. I didn't really know what to do with this piece of information (although it did seem to be important). Now I have the tools to know what to do.

Reflective narratives addressed how the integrative approach enhanced patient-centred perspective and a pluralistic view:

I loved the expanding approach with this perspective, and I think that is often missed in how we see things with our training. The course impacted me when I was talking to a family that had that moment just lost their father, and I saw how my understanding of the family's experience in the hospital had changed. I think that what this past week emphasized for me the importance of the "WELL BEING" around...that not everything can be measured by the frequency of the treatment and contraction/expansion of the tumor...

Patient-centred care was another theme in the narratives, primarily with respect to practical ways in which it could be part of doctor-patient communication:

...to listen not only to what the patient is saying, but how he is saying it: the tone of the sound, the volume, the motion...

A shift to a more patient-centred perspective was mentioned following the meetings with IPs who were seen as role models:

To connect between the patient's symptoms and to their current life story; to help the patient with their journey and their burden, by given them the

tools...to map out the patient's life...resources, the environment in which he lives, diet, relationships, spirituality, dreams, etc

### Self-reflections on becoming a physician

Many narratives addressed the future work as physicians, often specifying the specialisation they were considering—whether family medicine, palliative care, geriatrics or other specialties.

As for the future, I will without doubt strive to be a more broad-minded physician, as best as I can; with further training in different and varied subjects.

Some reflections dealt with the student's own search, exploring therapeutic qualities and becoming more attuned to their mission as physicians and therapists:

Until now I was learning about DOING, how to really be a doctor. Today I got a more clear picture of how we not only "DO" but also "BE PRESENT" and help the patient to traverse his path and to BE with himself.

The feeling of 'BEING' was perceived as a core aspect of the students' role as therapist:

My perception of myself as a therapist became more solidified. One of the things that repeats and weaves throughout integrative medicine is the listening, acceptance, touch...the ability to accept and help.... Even if I don't know how to treat them, I hope that I will be able to understand them, to listen to them...

Another aspect reported was the acknowledgement of their emotional and health-belief status. :

To recognize ourselves – our weaknesses and strengths...what makes us tick...and to use this to heal others...  
I learned about humility, and how to recognize my shortcomings...and now I can approach the task of touch with my patients from a more comfortable place, more flexible...perhaps more peaceful

Thoughts on their future as physicians was accompanied with self-reflection on personal well-being and health-belief model:

My reflection from the touch/movement therapy mentor was how important it is for us to look after ourselves: to breath, to share, to release with someone who can help, so that we can continue and accept and treat patients...to prevent burnout

## DISCUSSION

The present study explored the impact of an innovative elective online clinical course in IM, created to overcome the restrictions imposed by the COVID-19 pandemic. Quantitative assessment suggests that despite the small number of participants and its online venue, the course was able to create a significant shift in both the approach to IM and perceived acquisition of IM-related skills. This change was also reported by

IM sceptical students. These skills included doctor/student–patient communication (eg, codefining 'realistic' vs 'non-realistic treatment goals'); assessment of effectiveness and safety of IM treatments; referral to an IP and IM treatments; and understanding the multidisciplinary team approach, communicating and working with non-physician IM practitioners.

Qualitative analysis identified an enhanced level of patient-centred care and a significant increase in self-reflection on becoming a physician. This entailed self-awareness and resilience skills following mind–body interventions.<sup>20 21</sup> Students reported that the integrative setting of care was stimulating and provided practical IM communication and competency skills, especially for evaluating the effectiveness and safety of these therapies.

The course enabled students to explore their own professional path, with an outward reflection towards the patient, emphasising the patient-centred perspective. At the same time, it enabled them to inwardly explore the personal meaningfulness of this search, the 'why' which can lead to personal and professional growth. The course also provided specific IM-related outcomes, facilitating a patient-centred focus enriched by self-experiencing with the mosaic of IM metaphors of herbs, touch, movement and meditation.

The present study has a number of limitations, including the selection bias of an elective course. While most students felt they had achieved the course objectives, they also felt the absence of direct contact with patients and hands-on experience of working with IPs and IM practitioners in an integrative setting of care. The small sample size precluded subgroup analysis of gender and ethnic/cultural-related characteristics. There needs to be postcourse assessment (quantitative and qualitative) to evaluate the long-term implementation of the learnt IM skills in clinical practice, as well as student–patient communication and patient-centred approach during clinical training and work.

In conclusion, the present study showed that an online clinical elective course in IM is feasible and has the potential to modify students' attitudes toward IM while enhancing communication skills and facilitating a patient-centred perspective. The educational outcomes should encourage further online teaching initiatives in IM, both during and after the current pandemic.

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