

Integration of complementary medicine in supportive cancer care: survey of health-care providers' perspectives from 16 countries in the Middle East

Eran Ben-Arye · Elad Schiff · Kamer Mutafoğlu · Suha Omran · Ramzi Hajjar ·
Haris Charalambous · Tahani Dweikat · Ibtisam Ghrayeb · Gil Bar Sela ·
Ibrahim Turker · Azza Hassan · Esmat Hassan · Ariela Popper-Giveon · Bashar Saad ·
Omar Nimri · Rejin Kebudi · Jamal Dagash · Michael Silbermann

Received: 20 August 2014 / Accepted: 13 January 2015 / Published online: 24 January 2015
© Springer-Verlag Berlin Heidelberg 2015

Abstract

Introduction In this multinational Middle-Eastern study, we assessed health-care providers' (HCPs) perspectives on their patients' use of complementary and traditional medicine (CTM) and identified the leading barriers to CTM integration in supportive cancer care.

Methods A 17-item questionnaire was developed and administered to HCPs attending palliative medicine workshops conducted across the Middle East by the Middle East Cancer Consortium.

Results 339 HCPs from 16 countries across the Middle East completed the questionnaire (80.3 % response rate).

E. Ben-Arye · J. Dagash
Integrative Oncology Program, The Oncology Service and Lin
Medical Center, Clalit Health Services, 35 Rothschild St.,
Haifa, Western Galilee District, Israel

T. Dweikat
Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates

E. Ben-Arye (✉)
Complementary and Traditional Medicine Unit, Department of
Family Medicine, Faculty of Medicine, Technion-Israel Institute of
Technology, Haifa, Israel
e-mail: eranben@netvision.net.il

I. Ghrayeb
Makassed Charitable Hospital, East Jerusalem, Palestine

E. Schiff
Department of Internal Medicine, and Integrative Medicine Service,
Bnai-Zion Hospital, Haifa, Israel

G. B. Sela
Division of Oncology, Rambam Health Care Campus, Haifa, Israel

E. Schiff
The Department for Complementary Medicine, Law and Ethics, The
International Center for Health, Law and Ethics, Haifa University,
Haifa, Israel

I. Turker
Dr. A.Y Ankara Oncology Training and Research Hospital,
Ankara, Turkey

K. Mutafoğlu
Center for Palliative Care Research and Education, Dokuz Eylül
University, Inciralti, Izmir, Turkey

A. Hassan
National Center for Cancer Care and Research, Doha, Qatar

S. Omran
Faculty of Nursing, Jordan University of Science and Technology,
Irbid, Jordan

E. Hassan
Botany Department, National Research Centre, Dokki, Giza, Egypt

R. Hajjar
American University in Beirut, Beirut, Lebanon

A. Popper-Giveon
David Yellin Academic College, Jerusalem, Israel

H. Charalambous
Bank of Cyprus Oncology Center, Nicosia, Cyprus

B. Saad
Qasemi Research Center, Al-Qasemi Academy, Baqa
El-Gharbia, Israel

B. Saad
Palestinian Authority, Faculty of Arts and Sciences, Arab American
University, Jenin, Palestine

Respondents perceived their patients' reasons for CTM use primarily in the context of cancer cure (63 %) and quality of life (QOL) improvement (57 %). Expectation regarding CTM's role in cancer cure/survival was more pronounced in Turkey, Jordan, the Palestinian Authority, and the Persian Gulf area. In contrast, the expectation that CTM would improve QOL was more emphasized in Israel. A mid-position between the cure/survival and QOL poles was observed in Cyprus, Lebanon, and the North African countries. Leading barriers to CTM integration in supportive cancer care included oncologists' skepticism and a gap between patients' expectations and HCP's objectives. Respondents' leading recommendation to HCPs was to communicate integrative care emphasizing well-being and improved functioning in accordance with their patients' health beliefs.

Conclusion CTM integration in supportive cancer care can be facilitated by implementing a platform for Middle Eastern clinical collaborations. HCPs' expectations and experiences with CTM have been positive in the oncology setting. These data need to be corroborated with information of patients' expectations on the provision of CTM over all phases of the oncology treatment.

Keywords Cross-cultural medicine · Integrative medicine · Middle East · Complementary and alternative medicine · Doctor-patient communication · Quality of life

Introduction

Many patients challenged by a cancer diagnosis use complementary medicine concomitant with oncology treatment, seeking to improve their quality of life, and enhance coping with disability and threat of death [1]. In developed countries, complementary medicine use is reported by one third to one half of patients with cancer, although the prevalence may vary with respect to clinical settings (cancer types, localized vs. advanced progression of disease, etc.) and phases of oncology treatment (following diagnosis, during active oncology treatment, along survivorship, hospice care, etc.) [2]. In developing countries and within the growing communities of immigrants in industrialized countries, complementary medicine

use is associated with traditional medicine (CTM—complementary and *traditional* medicine) which often includes herbs, nutrition/dietary supplements, manual treatments (e.g. acupuncture, massage), and spiritual-religious practices [3].

In the last two decades, oncologists, health-care providers, and health policy leaders have begun to acknowledge the significant impact of CTM use on doctor-patient communication as well as its potential to interfere with cancer treatment efficacy via dietary/herbal supplement-drug interactions [4]. On the other hand, certain CTM treatments have been shown to improve patients' well-being during cancer treatment, as reported in randomized controlled trials published in leading peer-review journals [5]. As a result, evidence-based complementary medicine services have been integrated within leading oncology centers in the USA and worldwide, aiming to provide safe, patient-centered, and quality of life (QOL)-oriented consultation and treatment in the framework of a newly emerging concept of integrative oncology [6].

The use of CTM among patients with cancer in the Middle East is highly prevalent, ranging from 35 % in Iran [7] to 46 % in Morocco [8], 51 % in Israel [9], 57 % in Turkey [10], 90 % in Saudi Arabia [11], and nearly 100 % in Jordan [12]. Nevertheless, despite this high prevalence of use, only limited research has been published on integration of CTM in cancer care across the Middle East.

Therefore, in this study, we aimed to explore whatever barriers may exist in the Middle East to the integration of CTM in supportive cancer care. The Middle East is an intriguing research setting for exploring the potential of CTM integration into mainstream cancer care, due to its multicultural diversity and unique historical-cultural, ethno-botanical, and geographical role as a bridge between the West and East. The present survey involved health-care providers (HCPs) who treat patients with cancer every day. After attaining a deeper understanding of HCPs' perspectives on CTM integration, we set out to provide practical recommendations to HCPs encountering similar challenges in societies facing multicultural diversity in other regions in the world.

Methods

Study design

The questionnaire was developed and revised following a review of existing studies by four of the authors (EBA, ES, APG, and MS). The present study was undertaken in the following stages:

1. Comprehensive literature review was initiated focusing on studies published by Middle Eastern researchers on CTM use [13, 14] and the implications of CTM use on doctor-patient communication in cancer care [15, 16].

O. Nimri
Department of Cancer Prevention, Ministry of Health,
Amman, Jordan

R. Kebudi
Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey

M. Silbermann
Middle East Cancer Consortium, Haifa, Israel

2. Analysis of barriers to integration of complementary medicine was performed, as previously reported [17–21].
3. Collaboration between clinicians and researchers was facilitated by the Middle East Cancer Consortium (MECC) [22]. The consortium involved clinicians from Egypt, Israel, Jordan, Morocco, the Palestinian Authority, and Turkey who coauthored several joint publications [23, 24] and participated in two regional conferences on Middle Eastern integrative oncology (Larnaca, Cyprus, 2010; Baqa El-Gharbia, Israel, 2011 [25, 26]), and collaborated on a special issue on “Complementary and integrative oncology in the cross-cultural region of the Middle East and South Asia” published by the journal *Evidence-Based Complementary Alternative Medicine* [27].
4. The above three stages were followed by the drafting of a questionnaire based on leading themes of CTM integration within supportive cancer care and potential barriers to it. The questionnaire was reviewed by a focus group of 12 HCPs in order to refine its clarity and improve its comprehensibility. The focus group comprised participants varying in age, gender, religion, and cultural background, as well as their specific medical profession within the oncology department, and their familiarity with or training in CTM. Following an additional review and appraisal, the final English version of the questionnaire was translated into Turkish. Translation accuracy was validated by backward professional translation into English. Six questions addressed demographic background (age, gender, religion, country, professional status, and institution with which the respondent is affiliated). Other questions included perspectives on CTM integration in cancer care in one’s country/institution. This latter group of questions included four multiple-choice questions, four structured questions with responses on a one (very low)- to five or seven (very high)-point scale, and three open questions. CTM was defined by the authors using terminology that covers the broad spectrum of nonconventional medicine ranging from *alternative* to *integrative* care, as follows: “The definition of CTM in this study includes therapies often named alternative (in Arabic: *al tibb al-badil*), complementary (*al tibb al-mukamel*), integrative (*al tibb al mudmaj*), natural, or folk/traditional medicine, which may also include traditional Islamic medicine, herbs, Chinese medicine (including acupuncture), dietary/nutritional therapy, mind-body-spiritual modalities (e.g. meditation, yoga, guided imagery, relaxation), manual healing/massage/movement therapies, Anthroposophic medicine, homeopathy, energy and healing therapies, etc.”

The final questionnaires containing a total of 17 questions were mailed to HCPs (oncologists, surgeons, family physicians, oncology nurses, psycho-oncologists, and paramedical practitioners) in the participating Middle

Eastern countries who regularly treat patients with cancer and who attended workshops in supportive/palliative care conducted by the MECC. Additional HCPs were identified by our contact people in different countries, which enlarged the number of respondents and the spectrum of perspectives. Snowball sampling methodology was restricted to selected HCPs (up to three per country) participating in MECC conferences who were asked to trace up at least 20 HCPs in their country who met the criteria described above.

Study sites and participants

The study was conducted between June 2012 and July 2013, and included the following 16 Middle Eastern countries (by alphabetical order): Cyprus, Egypt, Iraq, Israel, Jordan, Lebanon, Oman, Pakistan, Palestinian Authority, Qatar, Sudan, Syria, Tunisia, Turkey, United Arab Emirates, and Yemen. HCPs reported on affiliation with 63 different cancer care and/or academic centers.

Data analysis

Data were collated using an Excel spreadsheet (Microsoft 2010). Descriptive analysis employed SPSS for Windows (version 18; SPSS Inc., Chicago, IL, USA). Pearson’s chi-square test and Fisher’s exact test with Bonferroni adjustment were used to detect differences in the prevalence of categorical variables and demographic data between the respondents in the various countries.

We tested for differences using the Mann-Whitney *U* tests/*T* tests. One-way ANOVA with Scheffe’s post hoc test was used to ascertain differences between quantitative parameters. The Friedman test with multiple comparisons was applied for paired analysis; the tests were two-tailed, and $p \leq 0.05$ was deemed significant.

Ethical considerations

As this is an initial baseline survey asking for current service levels and does not require patient or staff details, IRB or Helsinki committee approvals were not required in the participating countries.

Results

Participation in this study was initially offered to 422 HCPs from 16 countries across the Middle East, out of whom 339 responded (response rate 80.3 %). Our samples, for the most part, were broadly representative of each country (Table 1).

Table 1 Demographic characteristics of respondents

Country	Number of respondents	Age (mean±SD [median])	Gender Male (N, %) Female (N, %)	Religion (M, Muslim; C, Christian; D, Druze; J, Jewish)	Profession, N (%) (P, physician; R, researcher; PM, paramedic/nurse; C, CTM practitioner; D, director)
Total cohort	N=339	41.35±9.3 (40)	157 (48 %) 170 (52 %)	M, 203 (63 %) J, 64 (20 %) C, 51 (16 %) D, 3 (1 %) Not reported, 18	P, 198 (58 %) R, 55 (16 %) PM, 65 (19 %) C, 5 (1.5 %) D, 14 (4 %)
Cyprus	n=30	43.63±7.4 (42)	11 (38 %) 18 (62 %)	C, 28 (100 %) Not reported, 2	P, 14 (47 %) R, 2 (7 %) PM: 14 (47 %) D: 1 (3 %)
Egypt	n=12	45.82±8.9 (45)	9 (75 %) 3 (25 %)	M, 12 (100 %)	P, 9 (75 %) R, 1 (8 %) D, 1 (8 %)
Iraq	n=11	39.64±6.8 (39)	6 (55 %) 5 (45 %)	M, 10 (91 %) C, 1 (9 %)	P, 11 (100 %)
Israel	n=76	45.68±10.6 (45)	26 (36 %) 47 (64 %)	J, 59 (83.1 %) M, 9 (12.7 %) C, 3 (4.2 %) Not reported, 5	P, 45 (59 %) R, 4 (5 %) PM, 23 (30 %) C, 2 (2.6 %) D, 2 (3 %)
Jordan	n=46	36.49±10.2 (33)	35 (76 %) 11 (24 %)	M, 43 (93.5 %) C, 3 (6.5 %)	P, 18 (39 %) R: 6 (13 %) PM, 17 (37 %) D, 2 (4 %)
Lebanon	n=26	42.09±8.8 (44)	14 (61 %) 9 (39 %)	M, 10 (44 %) C, 10 (44 %) D, 3 (13 %) Not reported, 3	P, 19 (73 %) R, 2 (8 %)
Oman	n=1	40	1 (100 %) 0 (0 %)	M, 1 (100 %)	P, 1 (100 %) R, 1 (100 %)
Palestinian Authority	n=32	37.79±7.9 (37)	17 (61 %) 11 (39 %)	M, 25 (83 %) J, 5 (17 %) Not reported, 2	P, 9 (28 %) R, 8 (25 %) PM, 4 (13 %) D, 1 (3 %)
Pakistan	n=1	40	1 (100 %) 0 (0 %)	M, 1(100 %)	P, 1 (100 %)
Qatar	n=11	44.60±7.8 (47)	7 (64 %) 4 (36 %)	M, 10 (91 %) C, 1 (9 %)	P, 11 (100 %) R, 1 (9 %)
Sudan	n=2	36	0 (0 %) 2 (100 %)	M, 2 (100 %)	P, 2 (100 %)
Syria	n=1	29	1 (100 %) 0 (0 %)	M, 1 (100 %)	P, 1 (100 %)
Tunisia	n=3	48.67±2.5 (49)	2 (67 %) 1 (33 %)	M, 3 (100 %)	P, 1(33 %) R, 1 (33 %)
Turkey	n=68	40.33±7.3 (39)	22 (33 %) 45 (67 %)	M, 66 (100 %) Not reported, 2	P, 51 (75 %) R, 27 (40 %) PM, 1 (2 %) C, 3 (4 %) D, 5 (7 %)
United Arab Emirates	n=16	34.4±5.6 (32)	4 (25 %) 12 (75 %)	M, 7 (58 %) C, 5 (42 %) Not reported, 4	P, 3 (19 %) R, 1 (6.3 %) PM, 6 (37.5 %)
Yemen	n=3	46.33±8.3 (49)	1 (33 %) 2 (67 %)	M, 3 (100 %)	P, 2 (67 %) R, 1 (33 %) D, 2 (67 %)
<i>P value</i> ^a		<i>p</i> <0.05 ^b	<i>p</i> <0.0001 ^c	Not analyzed ^d	<i>p</i> <0.01 ^e

^a Data analysis was performed using multiple comparisons by Scheffe

^b Comparison of respondents' age in Israel vs. Turkey (*p*=0.041), Jordan (*p*<0.0001), and the Palestinian Authority (PA, *p*=0.01)

^c Comparison of respondents' gender in Jordan vs. Israel (*p*<0.0001), Turkey (*p*<0.0001), and Cyprus (*p*=0.0015); nonsignificant *p* values were obtained in other comparisons of respondents' gender

^d Data were not analyzed because this is considered an ethno-cultural and religious variable characterizing each of the participating countries

^e Comparison of respondents' profession in Turkey vs. Israel (*p*=0.0002) and PA (*p*<0.0001); PA vs. Lebanon (*p*=0.0013); nonsignificant *p* values were obtained in other comparisons of respondents' profession

Statistical analysis using Scheffé's multiple comparisons model is reported regarding the 278 respondents from the six leading cohorts (Israel, Turkey, Jordan, the Palestinian Authority, Cyprus, and Lebanon). Respondents from these six countries varied, as expected, in religion with significant representation of Muslim respondents in Turkey, Jordan, and Palestinian Authority (PA); Jews in Israel; and Christians in Cyprus and Lebanon. Respondents from Israel were older in age compared with Turkey, Jordan, and PA. A significantly lower percentage of female respondents was evident in Jordan compared with Turkey, Israel, and Cyprus. Concerning their specific medical profession, physician respondents were more prominent in Turkey (vs. Israel and PA) and in Lebanon compared with PA. Nevertheless, in all the other multiple comparisons, nonsignificant variance was found.

CTM use in cancer care: prevalence, motives, and context

In the six leading countries, rating for the use of CTM therapy ranged between 25 and 50 %. Herbal medicine was regarded as the leading CTM modality used by patients during chemotherapy or advanced cancer (89.1 %) as compared to dietary/nutritional, mind-body-spiritual, Chinese/acupuncture, or manual healing therapies; $p < 0.0001$). The use of herbs ranged from 79.7 % in Israel, 88.9 % in Jordan, 92 % in Lebanon, 93.5 % in PA, 95.6 % in Turkey, to 96.2 % in Cyprus.

Of their patients' possible motives for seeking CTM-related care, "to cure cancer" was rated as being the highest (63.1 %), followed by "to improve quality of life" (57 %). Subgroup analysis of HCPs' perception of patients' motives for using CTM was performed (categorizing 327 of the 339 respondents into six subgroups based on demographic, geographic, and cultural considerations). These subgroups included Israel (76), Turkey (68), Jordan and PA (78), Cyprus and Lebanon/Syria (57), North Africa (17, including Egypt, Tunisia, and Sudan), and the Persian Gulf area (31, including Qatar, Yemen, Oman, and the United Arab Emirates). The analysis indicated that the desire for CTM for cancer cure was significantly higher in Turkey compared to Israel (77.9 vs. 43.8 %, $p = 0.002$) and North Africa (35.3 %, compared to Turkey, $p = 0.002$). However, CTM use for improving QOL was higher in Israel (86.8 %) vs. Turkey (52.9 %), Jordan/PA (31 %), North Africa (35.3 %), and the Gulf states (48.4 %), $p < 0.0001$, in all comparisons, but not when compared to Cyprus/Lebanon (73.3 %, $p = 0.08$). Significant differences, however, were noted when comparing Cyprus/Lebanon to Jordan/PA (73.3 vs. 31 %, $p < 0.0001$). Using CTM to reduce side effects of oncology treatment was significant in Israel (82.1 %) compared with Turkey (38.2 %, $p < 0.0001$), Jordan/PA (35.2 %, $p < 0.0001$), Cyprus/Lebanon (47.5 %, $p = 0.0004$), North Africa (35.3 %, $p = 0.0003$), and the Gulf (29 %, $p < 0.0001$).

Expectations of integrated CTM consultation provided within oncology care

Respondents were asked to assess on a 7-point scale (ranging from 1—very low to 7—very high) their patients' main expectations of CTM consultation and treatment, if CTM were to be integrated within the oncology centers in their country. Analysis of the entire cohort, based on the Friedman test with repeated measures, revealed that expectation of CTM to "cure the disease completely" (mean score rated 3.92 ± 2.02 [median=4] on a 1- to 7-point scale) was significantly lower (adjusted significance $p = 0.0001$) compared with each of the following expectations: "To improve daily functioning" (4.96 ± 1.33 , median=5); "To strengthen general ability to cope with the disease" (4.87 ± 1.33 , median=5); "To reduce the side effects of chemotherapy" (4.92 ± 1.46 , median=5); "To support the patient emotionally" (4.83 ± 1.32 , median=5); and "To support the patient spiritually" (4.54 ± 1.53 , median=5).

Figure 1 shows comparisons of responses in the six subgroups concerning three of the questioned expectations. (1) CTM may improve daily functioning: higher in Israel (compared with Turkey [$p = 0.04$], Jordan/PA [$p < 0.0001$], and North Africa [$p = 0.001$]) and in Cyprus/Lebanon (compared with North Africa, $p = 0.045$). (2) CTM may reduce chemotherapy side effects: also higher in Israel compared with Jordan/PA ($p < 0.0001$), Cyprus/Lebanon ($p = 0.015$), the Gulf ($p < 0.0001$), but with only borderline significance compared with Turkey ($p = 0.049$). (3) Expecting CTM to cure cancer was rated highest in Turkey (compared with Israel [$p = 0.012$] and North Africa [$p = 0.005$]), and in Jordan/PA (compared with North Africa [$p = 0.008$] and Israel [$p = 0.021$]).

Barriers to CTM integration in cancer care

The perceived main barrier to CTM integration within oncology centers was oncologists' skepticism and objection to CTM (3.04 ± 1.06 , median=3 on a 5-point scale ranging from 0 to 4). Both physicians and nurses shared this oncologists' skepticism barrier (2.98 ± 1.07 , median=3 vs. 3.08 ± 0.94 , median=3, $p = 0.50$). Oncologists' skepticism was rated significantly higher (adjusted significance $p = 0.0001$ on the Friedman test with repeated measures) as compared to the following potential barriers: patients' unfamiliarity with the concept of CTM integration, geographical factors (e.g., distance and accessibility), and suboptimal matching of CTM modalities to patients' cultural and religious codes and beliefs. Oncologists' skepticism was rated higher in Cyprus/Lebanon as compared to Jordan/PA (3.35 ± 0.85 , median=4 vs. 2.72 ± 1.01 , median=3, $p = 0.038$) and North Africa (2.29 ± 1.61 , median=2, $p = 0.019$). Oncologists' skepticism in the North African subgroup was also lower compared to Turkey (2.29 ± 1.61 ,

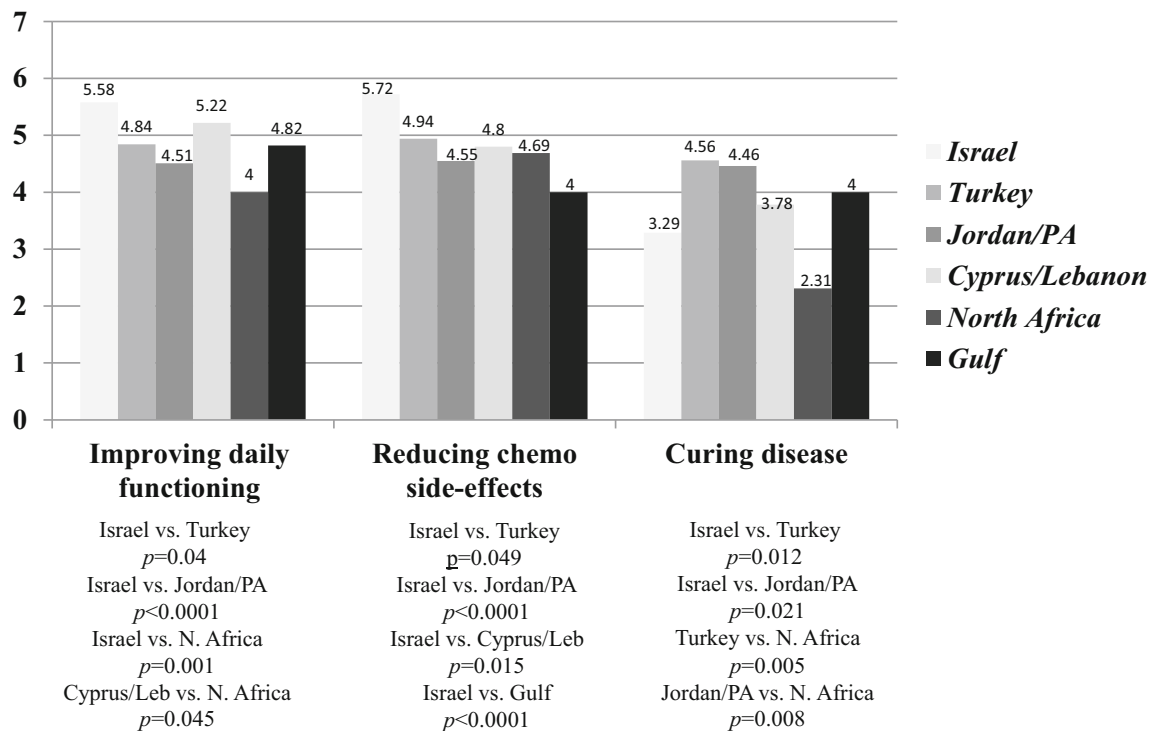


Fig. 1 Respondents' assessment of their patients' expectations of CTM consultation if integrated within the oncology centers in their country [scores are rated on a 1 (low agreement) to 7 scale (high agreement)]

median=2 vs. 3.28 ± 0.89 , median=4, $p=0.033$). Another potential barrier to CTM integration concerned the gap between patients' expectations and the integrative program's objectives (e.g., patients' anticipated cure as opposed to improved QOL). This barrier was rated significantly lower in Israel compared to Jordan/PA (2.33 ± 0.98 , median=2 vs. 2.91 ± 0.87 , median=3; $p=0.03$) and Cyprus/Lebanon (2.33 ± 0.98 , median=2 vs. 3.02 ± 0.99 , median=3; $p=0.011$).

Recommendations for better integration of CTM and supportive cancer care

Respondents were also asked to rate recommendations on a five-point scale (ranging from 0 to 4), which might potentially promote successful interaction between patients and integrative physicians within their oncology center. Focusing doctor-patient communication on CTM's role in improving wellbeing and functioning (as opposed to "cure" or prolonging survival) received the highest score. In a pairwise comparison, this statement scored significantly higher than the recommendation for reducing oncologists' skepticism of CTM (3.24 vs. 2.96, $p=0.001$; adjusted significance $p=0.031$). This QOL-oriented recommendation regarding improved wellbeing and ability to function was scored higher in the Israeli subgroup compared with the Jordan/PA (3.59 vs. 2.95, $p=0.005$) and the Gulf (2.62, $p=0.002$) subgroups.

Discussion

Our results found a high prevalence of CTM use in the Middle East similar to studies published in other regions (ranging from 25 to 50 % of cancer patients) [28]. The predominant use of herbs (ranging from 80 % in Israel to 95 % and above in Turkey and Cyprus) pose a serious concern regarding safety due to the potential risks of herb-drug interactions that may impair chemotherapy and oncology treatment efficacy. This safety concern is one of the leading arguments for integrating trained CTM consultants (integrative physicians) within the conventional oncology setting who would be able to detect the use of dietary/herbal supplements and monitor potential risks and interactions with oncology treatment [29]. Moreover, this study aimed to explore in greater depth how HCPs perceive their patients' beliefs regarding CTM's role in cancer care. Based on previous studies conducted in integrative and non-integrative settings across the Middle East [30], we hypothesized that patients' expectations of CTM's role may be focused on two central domains: (a) using CTM to extend survival or cure; (b) using CTM to improve QOL. Our main finding is that, despite demographic variances in the different countries, cancer patients' motives for using CTM are primarily within the contexts of survival/cure and QOL. Yet, subgroup analysis revealed differences between countries. Countries of respondents who prioritized CTM cancer cure/survival included Turkey, Jordan, the Palestinian Authority, and the

Gulf subgroups. These included expectations from an integrated CTM consultation if provided within the oncology center, whereas in Israel, QOL improvement was given the highest priority. Thus, in terms of prioritizing life quality, Israel's position lies at the opposite end of the spectrum. This approach was evident not only in respondents' perspectives towards integrated CTM consultation, but also in their assessment of potential barriers to CTM integration (involving a better interaction with the integrative physician). A mid-point position emphasizing both survival/cure and QOL expectations was reported by respondents from Lebanon and Cyprus and to a lesser extent from the North African subgroup.

Barriers to CTM integration and HCPs' recommendations for overcoming these barriers are additional topics highlighted in this study. Oncologists' skepticism and objection to CTM integration within the oncology care system was viewed as the leading barrier to integration. Nonetheless, the focus on patients' well-being and function was highly scored as a means of overcoming CTM integration barriers and of promoting successful patient-integrative physician interaction. The issue of QOL was by far prioritized over the oncologists' skepticism towards CTM. These findings suggest that the theme of CTM integration in oncology practice is a complex one and not just limited to evidence-based data on efficacy and safety of CTM use. The issue of integration also involves aspects of patient-practitioner communication. We therefore suggest that patient-practitioner communication should focus on the importance of CTM's role in improving QOL, coping, and wellbeing. This recommendation is in accordance with Schofield et al. comprehensive guidelines for clinicians on effectively discussing complementary and alternative medicine with patients in a conventional oncology setting [31]. Our study has several strengths. We believe that it is the largest assessment of the opinions of HCPs for integrative oncology practice to date, with 339 participants. The study encompassed 16 countries and used uniform, standard questions in all of them. In spite of current geopolitical barriers, our response rate totaled 80 %.

A limitation of the present study is the lack of uniformity in the sample size of the different countries. We decided both to analyze the entire cohort and to add subgroup analysis of countries with close demographics. This approach may be questioned by readers, and we agree that the analysis of different countries placed together into subgroups needs to be interpreted with caution. We are currently considering a larger, more encompassing study that would provide greater generalizability of results relevant to other regions worldwide.

In conclusion, CTM is perceived by HCPs to be widely used in the Middle East by people with cancer. Integration of CTM should focus on improving QOL, while this point needs to be better communicated to patients. This conclusion is supported by a number of ongoing clinical studies that confirm the beneficial role of CTM in QOL improvement rather

than in survival prolongation [11]. The process of CTM integration needs also to meet the challenge of the overwhelming use of herbs as reported in our study, which imposes potential risks and may detrimentally impact oncology drug efficacy as discussed before [10]. We call to implement our research results in real-life oncology practice across the Middle East by initiating educational clinical workshops for HCPs who are willing to lead CTM integration in their oncology centers. This challenging collaborative project will need international support of medical educators, researchers, and clinicians who are willing to join the integrative process of welding traditional and high-tech modern medicine shared by clinicians who deeply value patients' care regardless of regional differences.

Our study suggests that integrative oncology is a potential seed for fruitful collaboration in a region renowned for its conflicts and for deep-seeded differences among its people in terms of culture and religion. It is specifically these differences, as well as the multicultural societies, that exist in the Middle East, which seem to make this region the ideal laboratory for future research on the role of CTM in advancing patient-cancer care.

Acknowledgments We thank Ms. Marianne Steinmetz for editing the English manuscript and Ms. Ronit Leiba for performing the statistical analysis. We also thank the following persons for their contribution in data monitoring: Dr. Orit Gressel-Raz, Ms. Ronit Leibowitz, Ms. Shimrit Roni, Mr. Shmuel Attias, and Ms. Sarah Ben Shlush. This survey was supported in part by funds from the Middle East Cancer Consortium.

Conflict of interest The authors state that there are neither actual nor potential conflicts of interest, including any financial, personal, or other relationships with other people or organizations whatsoever.

Funding This work was not supported by grants.

References

1. Navo MA, Phan J, Vaughan C et al (2004) An assessment of the utilization of complementary and alternative medication in women with gynecologic or breast malignancies. *J Clin Oncol* 22(4):671–677
2. Gansler T, Kaw C, Crammer C, Smith T (2008) A population-based study of prevalence of complementary methods use by cancer survivors: a report from the American Cancer Society's studies of cancer survivors. *Cancer* 113(5):1048–1057
3. Azaizeh H, Saad B, Cooper E et al (2010) Traditional Arabic and Islamic medicine, a re-emerging health aid. *J Evid-Based Complementary Altern Med* 7(4):419–424
4. Sparreboom A, Cox MC, Acharya MR et al (2004) Herbal remedies in the United States: potential adverse interactions with anticancer agents. *J Clin Oncol* 22(12):2489–2503
5. Molassiotis A, Bardy J, Finnegan-John J et al (2012) Acupuncture for cancer-related fatigue in patients with breast cancer: a pragmatic randomized controlled trial. *J Clin Oncol* 30(36):4470–4476
6. Seely D, Weeks L (2012) A systematic review of integrative oncology programs. *Current Oncology* 19:436–461

7. Montazeri A, Sajadian A, Ebrahimi M et al (2007) Factors predicting the use of complementary and alternative therapies among cancer patients in Iran. *Eur J Cancer Care (Engl)* 16(2):144–149
8. Brahmi SA, El M'rabet FZ, Benbrahim Z et al (2011) Complementary medicine use among Moroccan patients with cancer: a descriptive study. *Pan Afr Med J* 10:36
9. Paltiel O, Avitzour M, Peretz T et al (2001) Determinants of the use of complementary therapies by patients with cancer. *J Clin Oncol* 19(9):2439–2448
10. Yildiz I, Ozguroglu M, Toptas T et al (2013) Patterns of complementary and alternative medicine use among Turkish cancer patients. *J Palliat Med* 16(4):383–390
11. Jazieh AR, Al Sudairy R, Abulkhair O et al (2012) Use of complementary and alternative medicine by patients with cancer in Saudi Arabia. *J Altern Complement Med* 18(11):1045–1049
12. Akhu-Zaheya LM, Alkhasawneh EM (2012) Complementary alternative medicine use among a sample of Muslim Jordanian oncology patients. *Complement Ther Clin Pract* 18(2):121–126
13. Affi FU, Wazaify M, Jabr M et al (2010) The use of herbal preparations as complementary and alternative medicine (CAM) in a sample of patients with cancer in Jordan. *Complementary Therapies in Clinical Practice* 16(4):208–212
14. Jazieh AR, Al Sudairy R, Abulkhair O et al (2012) Use of complementary and alternative medicine by patients with cancer in Saudi Arabia. *J Altern Complement Med* 18(11):1045–1049
15. Frenkel M, Ben-Arye E (2008) Communicating with patients about the use of complementary and integrative medicine in cancer care. In: Cohen L, Markman M (eds) *Integrative oncology: incorporating complementary medicine into conventional care*. Humana Press, Totwa
16. Yildirim Y (2010) Patterns of the use of complementary and alternative medicine in women with metastatic cancer. *Cancer Nurs* 33(3):194–200
17. Ben-Arye E, Schiff E, Steiner M et al (2012) Attitudes of patients with gynecological and breast cancer toward integration of complementary medicine in cancer care. *Int J Gynecol Cancer* 22(1):146–153
18. Ben-Arye E, Schiff E, Shapira C et al (2012) Modeling an integrative oncology program within a community-centered oncology service in Israel. *Patient Educ Couns* 89(3):423–429
19. Ben-Arye E, Steiner M, Karkabi K et al (2012) Barriers to integration of traditional and complementary medicine in supportive cancer care of Arab patients in northern Israel. *Evid Based Complement Alternat Med* 2012:401867
20. Popper-Giveon A, Schiff E, Ben-Arye E (2012) I will always be with you: traditional and complementary therapists' perspectives on patient-therapist-doctor communication regarding treatment of Arab patients with cancer in Israel. *Patient Educ Couns* 89(3):381–386
21. Ben-Arye E, Schiff E, Zollman C, Heusser P et al (2013) Integrating complementary medicine in supportive cancer care models across four continents. *Med Oncol* 30(2):511
22. Silbermann M, Dweib Khleif A, Balducci L (2010) Healing by cancer. *J Clin Oncol* 28(8):1436–1437
23. Ben-Arye E, Schiff E, Hassan E, Mutafoğlu K, Lev-Ari S, Steiner M, Lavie O, Polliack A, Silbermann M, Lev E (2012) Integrative oncology in the Middle East: from traditional herbal knowledge to contemporary cancer care. *Ann Oncol* 23(1):211–221
24. Ben-Arye E, Ali-Shtayeh MS, Nejmi M et al (2012) Integrative oncology research in the Middle East: weaving traditional and complementary medicine in supportive care. *Support Care Cancer* 20(3):557–564
25. Ben-Arye E, Lev E, Schiff E (2010) MECC Workshop on Integrative Oncology in the Middle East – a collection of abstracts: *Complementary Medicine Oncology Research in the Middle-East: shifting from traditional to integrative cancer care*. *Journal of Palliative Medicine* 13(7):919–931
26. Ben-Arye E, Schiff E, Silbermann M (2011) Integrative medicine in Middle-Eastern cancer care: meetings with clinicians and researchers. *The Israel Journal of Family Practice* 21(2):42–46
27. Ben-Arye E, Cassileth B, Heusser P et al (2012) Complementary and integrative oncology in the cross-cultural region of the middle East and South Asia. *Evid Based Complement Alternat Med* 2012:940961
28. Homeber M, Bueschel G, Dennert G et al (2012) How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. *Integr Cancer Ther* 11(3):187–203
29. Ben-Arye E, Attias S, Tadmor T et al (2010) Herbs in hemato-oncological care: an evidence-based review of data on efficacy, safety, and drug interactions. *Leuk Lymphoma* 51(8):1414–1423
30. Popper-Giveon A, Schiff E, Ben-Arye E (2012) I will always be with you: traditional and complementary therapists' perspectives on patient-therapist-doctor communication regarding treatment of Arab patients with cancer in Israel. *Patient Educ Couns* 89(3):381–386
31. Schofield P, Diggins J, Charleson C, Marigliani R, Jefford M (2010) Effectively discussing complementary and alternative medicine in a conventional oncology setting: communication recommendations for clinicians. *Patient Educ Couns* 79(2):143–151