Perspectives of Complementary and Alternative Medicine use by cancer patients in a regional hospital in North Queensland, Australia

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A B S T R A C T

Objectives: This study aimed to investigate CAMs used, and reasons for and disclosure of this use by cancer patients in a regional hospital in North Queensland, Australia.

Methods: Patients attending the Day Oncology Unit of the Townsville University Hospital were invited to participate in a self-completed questionnaire or telephone interview regarding perspectives of their CAM use. Data were analysed using descriptive statistics and chi-squared and independent t-tests were performed to allow comparison between the responses by CAM users and non-users.

Results: 102 completed questionnaires were used in the analysis, where 40.2 % of respondents were found to be using some form of CAM. Cannabis, magnesium, and massage were the most prominent therapies used, with cannabis use in cancer, not commonly reported in prior literature. The main reasons given for using CAM were to treat symptoms of cancer, side-effects of treatment or to improve general health. Two-thirds of these respondents disclosed their CAM use to health professionals mostly to obtain a professional opinion or due to concerns of interactions with cancer treatment. CAM users were statistically more likely to have used CAM prior to their cancer diagnosis and have lower emotional wellbeing than non-users. Non-CAM users indicated that a lack of knowledge of CAM or concerns regarding interactions with cancer treatment were the most popular reasons for not adopting these therapies.

Conclusion: While lower than the averages of previously published CAM use, our study highlights that there is still a significant group of cancer patients in the North Queensland region using CAMs.

1. Introduction

Complementary and Alternative Medicines (CAM) use by cancer patients is often contentious in oncology. Since the 1970s[1] CAM use by cancer patients and their motivations for uptake of these therapies have been investigated,[1–5] with use shown to be more prevalent than in the general population.[6] In the last decade, an average of 51 % of cancer patients globally have admitted to using some form of CAM.[5]

CAMs are therapies that are outside of "conventional" or "Westernised" medicine used alongside conventional treatments (complementary), or used in place of it (alternative).[7] The National Centre for Complementary and Integrative Health (NCCIH) has classified CAM into three categories: Natural therapies, such as herbs, vitamins or supplements; Mind and Body therapies, such as meditation, acupuncture and massage; and "Other" therapies, consisting of traditional therapies and

those that do not fit the other categories, such as Ayurveda, Traditional Chinese medicine and homoeopathy.[7]

By their nature, CAMs can be patient-initiated and not always disclosed by patients to their treating health professionals. A systematic review reported an average of 40–50 % of cancer patients did not disclose their CAM use to their doctor. Common reasons for this non-disclosure were believing that their doctor was not interested, fearing their doctor's disapproval or their doctor not asking about their CAM.[8] This is of concern as these therapies may pose safety risks when combined with conventional anti-cancer treatments. St. John's Wort for example, a potent inducer of the cytochrome 450 enzyme family in the liver, can decrease the therapeutic effect when taken concurrently with several common chemotherapeutic agents such as taxanes or anthracyclines due to increased metabolism.[9,10]

Together these issues highlight the need to understand the

prevalence of CAM use in cancer patients as well the factors that may motivate their use. From an Australian perspective, the assessment of CAM use in cancer patients has focussed almost exclusively on radiation oncology patients[11–13] or those patients in rural and remote setting.[14,15] Therefore, to address this gap in recent literature, this study looks to investigate the perspectives of cancer patients receiving treatment at a regional Australian public hospital regarding their CAM use.

2. Materials and methods

2.1. Ethics statement

The study was approved by the Human Research Ethics Committees of James Cook University (Reference no. H7768) and the Townsville Hospital Health Service (THHS) (Reference no. HREC/2019/QTHS/47181), as well as the Research Governing Office of the THHS (Reference no. SSA/2019/QTHS/47181).

2.2. Setting

The Townsville University Hospital (TUH) is the largest tertiary hospital in the North Queensland region of Australia, with a clinical catchment population of over 695,000 people.[16] The population for this study were receiving treatment at the Day Oncology Unit at the TUH. The eligibility criteria for recruitment were those people over the age of 18 with a diagnosis of cancer, currently undergoing cancer treatment. Exclusion criteria were people who could not communicate in English or were not of sound cognition in any manner that would prevent giving informed consent to participate.

2.3. Questionnaire design and procedure

The data collection tool was developed to be used as a self-completed questionnaire or administered as a structured telephone interview. Questions design was aligned with the CAM Healthcare model, developed by Fouladbakhsh and Stommel,[17] based on the Behavioural Model for Health Service Use.[18] The CAM Healthcare model suggests that an individual's use of CAM is largely guided by three groups of determinants: Predisposing Factors, Enabling Factors and Need for Care Factors. Predisposing factors generally detail an individual's likelihood to use CAM, including demographic characteristics like gender, race, age, and marital status, and attitudes toward healthcare. Enabling factors involve the individual's ability to access CAMs, including determinants like income, employment, and access to health services. Need for Care Factors focus of the individual's health experience and their perceived need for CAM.[17] Each of these groups contain "Push" and "Pull" factors that may impact an individual's choice to use CAMs.

Recruitment was conducted at the Day Oncology Unit waiting area where patients checking in for treatment were informed of the research by administrative officers and, if interested in participating, to approach the primary researcher. They were then provided with study information and asked whether they wished to participate via questionnaire or telephone interview. The questionnaire was completed while the patient was waiting for treatment. For the telephone interviews, the patient was asked to sign a consent form and arrange a time to conduct the interview.

Recruitment was initially carried out between March 2019 and March 2020. In response to the general health and safety concerns of the COVID-19 pandemic, recruitment was stopped from March to September 2020. The second phase of recruitment was then carried out between October and December 2020.

Prior to being asked questions, respondents were given the NCCIH definition of CAM and examples of each category. Respondents were then asked whether they were using any CAMs, their reasons for this use and whether they disclosed this to their health professionals, while non-CAM users were asked why they had not chosen to use these therapies.

All respondents were asked for demographic information, details regarding their diagnosis and treatment and if they had previously used CAM. The final part of the question schedule was a quality-of-life survey, the FACT-G questionnaire, developed by the FACIT group.[19] This is a validated questionnaire that gives statements regarding the respondent's physical, social, emotional, and functional wellbeing. Likert-scale responses to these statements give a score for each of these wellbeing categories, as well as an overall quality-of-life score. This questionnaire was included in our schedule to assess whether the use of CAMs influenced respondents' quality-of-life.

Responses to the question schedule were entered into a Microsoft Excel document to allow tabulation of results and importing into SPSS for statistical analysis. To determine the statistical significance of the findings from the questionnaire, chi-squared tests and independent t-tests were performed comparing the responses given by CAM users and non-users to determine any predictors of CAM use.

3. Results

A total of 104 people consented to participate in the study (13 telephone interviews, 91 questionnaires). Data from 2 respondents were excluded from the analysis due to not meeting the inclusion criteria. This produced a final cohort of 102 respondents, which based on the 888 people treated annually in the Townsville Hospital oncology day unit according to the TUH data collection service, would allow findings to be stated at a 95 % confidence level with a confidence interval of 9.13.

Table 1 shows demographic data and responses to some general questions given by respondents. While slightly more women participated in the project, this was not statistically significant. Respondents were more likely to be married, be high school educated and born in Australia. Table 2 shows the cancer diagnoses stated by each respondent as well as treatments they had received. The three most common cancer diagnoses were breast (16.7 %), lung (14.7 %) and prostate cancer (8.8 %), with most respondents (89.2 %) having received chemotherapy during their cancer journey.

CAM users were found to be more likely to have used CAM prior to their diagnosis, which was found to be statistically significant (p < 0.001) and the only significant demographic trend regarding CAM use.

40.2 % of respondents indicated they were using CAMs. Table 3 shows CAM modalities used by more than 2 respondents; however 56 different CAM modalities were mentioned in completed questionnaires. The most used therapies were cannabis (26.8 %), magnesium (24.4 %) and massage (19.5 %); with the average CAM user utilising at least 2 CAM modalities. The most common sources of recommendation for CAM were friends and family (21 %) or personal motivation (19 %), while most of the information on CAMs were sourced from the internet (20 %). 32 % of CAMs were sources from a pharmacy, while 27 % were purchased from online distributors (data not shown).

The motivation for CAM use is presented in Fig. 1. Over half of CAM users stated that they used CAM to reduce their symptoms or the side effects of their medical treatment (58 %), or to improve their general health (58 %), while 50 % stated that they used CAM to treat their cancer.

Regarding discussions with health professionals, 34 % of CAM users had been asked about CAM, with 57 % of them being asked by their oncologist. Meanwhile, 68 % had disclosed their CAM use to a health professional. Most users disclosed their CAM use for a professional opinion (67 %) or due to concern about potential interactions with their cancer therapy (44 %). Out of the 11 people who gave reason as to why they did not disclose their CAM use to health professionals, 46 % indicated it was because they were never asked (data not shown).

61 respondents (59.8 %) indicated that they were not using CAM. Fig. 2 displays the reasons given by 50 respondents who indicated why they chose not to use CAM. The two main reasons respondents gave were that they did not have knowledge of CAM (44 %) and that they were concerned CAM may interact with their cancer treatment (34 %).

Table 1
Demographics and questionnaire responses of CAM users and non-users.

Demographics	CAM users (41)	Non-CAM users (61)	Significance (Chi-Squared Test)
Gender		(1 response missing)	
Male	18 (43.9 %)	30 (50 %)	0.594
Female	23 (55.1 %)	30 (50 %)	
Highest Level of Education			
Postgraduate Qualification	5 (12.2 %)	3 (4.9 %)	0.219
Bachelor's degree	3 (7.3 %)	6 (9.8 %)	
Trade Certificate	12 (29.3 %)	10 (16.4 %)	
Year 12 or equivalent	12 (29.3 %)	17 (27.9 %)	
Year 10 or below	9 (22 %)	23 (37.7 %)	
PREFER NOT TO SAY	0	2 (3.3 %)	
Marital Status			
Married	17 (42.5 %)	25 (41 %)	0.924
De-facto	4 (10 %)	5 (8.2 %)	
Separated	5 (12.5 %)	7 (11.5 %)	
Divorced	6 (15 %)	9 (14.8 %)	
Widowed	2 (5 %)	6 (9.8 %)	
Never married	4 (10 %)	8 (13.1 %)	
PREFER NOT TO SAY	2 (5 %)	1 (1.6 %)	
Religion	(1 response missing)		
Christian	18 (45 %)	19 (31.3 %)	0.189
Muslim	0	1 (1.6 %)	
No	19 (47.5 %)	38 (62.3 %)	
PREFER NOT TO SAY	3 (7.5 %)	3 (4.9 %)	
Currently Working	(2 responses missing)	(1 response missing)	
Yes	11 (27.5 %)	10 (16.9 %)	0.305
No	27 (67.5 %)	46 (80 %)	
PREFER NOT TO SAY	0	3 (5.1 %)	
Country of Birth	(1 response missing)	(1 response missing)	
Australia	32 (80 %)	47 (78.3 %)	0.577
England	4 (10 %)	2 (3.3 %)	
OTHER[a]	4 (10 %)	11 (18.3 %)	
Previously Used CAM	(2 responses missing)	(3 responses missing)	
Yes	28 (68.3 %)	5 (8.2 %)	**< 0.001**
No	11 (26.8 %)	53 (86.9 %)	
Interested in conversations regarding CAM	(3 responses missing)	(6 responses missing)	
Yes	23 (56.1 %)	34 (55.7 %)	0.901
No	15 (36.6 %)	21 (34.4 %)	

[a] Other responses included Malaysia, New Zealand, Ireland, Papua New Guinea, Scotland, Singapore, Sri Lanka, and the United Kingdom.

The average quality-of-life scores for CAM users and non-users are detailed in Table 4. All scores were comparable except for emotional wellbeing. Respondents who were non-users of CAM showed a statistically significantly higher emotional wellbeing score when compared to CAM users (p < 0.001).

4. Discussion

The CAM usage by 40.2 % of respondents in our study is consistent with systematic reviews of literature from 1970's to 2020, with usage quoted to be between 31.4 % and 52 %.[1,2,4,5] This is the first study to survey cancer patients from regional North Queensland, with other Australians studies reporting CAM use ranging from 37.4 %[12] to 78.4 %[11]; and an average CAM use of 52.2 %. There may be several reasons for the lower CAM usage in this study: Firstly, most of the Australian studies surveyed patients in radiation oncology centres,[11,12,20] while this study was carried out at a day oncology unit where most respondents had undergone chemotherapy. While this study did not show statistical difference in CAM use between cancer treatments, 'Healthcare treatment' is one of the 'Predisposing factors' that could

Table 2
Details about respondents' cancer diagnoses and treatment.

	Frequency	Percentage
CANCER DIAGNOSES		
Breast	17	16.7 %
Lung	15	14.7 %
Prostate	9	8.8 %
Oropharyngeal Cancer	7	6.9 %
AML	6	5.9 %
Bowel	6	5.9 %
Lymphoma	6	5.9 %
Metastatic Melanoma	5	4.9 %
Rectal/Anal	5	4.9 %
Myeloma	5	4.9 %
Multiple – unsure of primary site	4	3.9 %
Do not wish to say/responses missing	3	2.9 %
Pancreatic	3	2.9 %
TREATMENTS RECEIVED (multiple responses permitted)		
Chemotherapy	91	89.2 %
Radiotherapy	41	40 %
Surgery	31	30.3 %
Hormone Therapy	17	16.7 %
Other	20	19.6 %

Table 3
Types of CAM used by respondents.

CAM used	Number of users (%)
Cannabis (CBD, Cannabis, THC, Hemp)	11 (26.8 %)
Magnesium	10 (24.4 %)
Massage	8 (19.5 %)
Vitamin C[a]	5 (12.2 %)
Vitamin D[a]	5 (12.2 %)
Yoga	4 (9.8 %)
Turmeric[a]	4 (9.8 %)
Meditation/Mindfulness	3 (7.3 %)
Calcium[a]	3 (7.3 %)
Zinc[a]	3 (7.3 %)

[a] Includes combination products.

influence CAM use outlined in the CAM healthcare model.[17] Secondly, the timeframe of CAM use was variable and could have contributed to the difference in usage rate. Our study was of patients currently using CAM, while the study by Wilkinson and colleagues asked about patient's CAM use in the last 12 months,[15] which was 49 %. Alternatively, Edwards and colleagues reported CAM use of 82.9 % of respondents "during their cancer journey".[11]

This study focussed on the specific CAM therapies used by respondents, while the other Australian studies categorised CAMs into groups (such as 'vitamins', 'herbal therapies' and 'antioxidants'), making direct comparisons with this study difficult. All 5 studies[11,12,14,15,20] did, however find that vitamins and supplements were one of the most common CAM modalities used by their respondents. This is in line with our findings that magnesium, vitamin D and vitamin C were in the 5 most common individual therapies. Additionally, two of the studies[15,20] also found that massage was the most common mind and body therapy, which the third most used CAM in this study.

One notable observation was that of cannabis as the most common CAM used by the respondents in this study. This has not been identified in prior literature focussing on CAM use in cancer patients. In fact, recent studies have only identified it as a minor CAM used by cancer patients if at all.[10] However, Drosdowsky and colleagues published an article in 2020 that looked at the medicinal and recreational use of cannabis by cancer patients at the Peter MacCallum Cancer Centre in Melbourne, Australia. They found that 4 % of cancer patients were using cannabis for medicinal purposes,[21] which is lower than our findings. The research for the current study was carried out by an independent researcher who was not attached to any hospital treating teams. It is possible that given the anonymous nature of the survey and that they
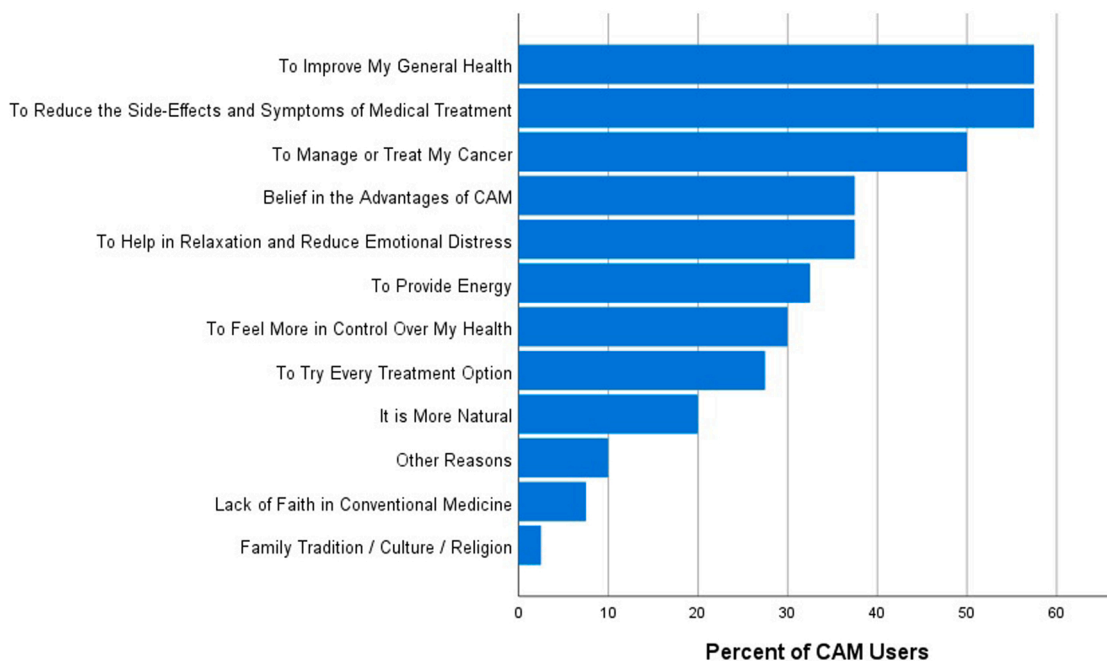
Fig. 1. Reasons for CAM use (multiple responses allowed).
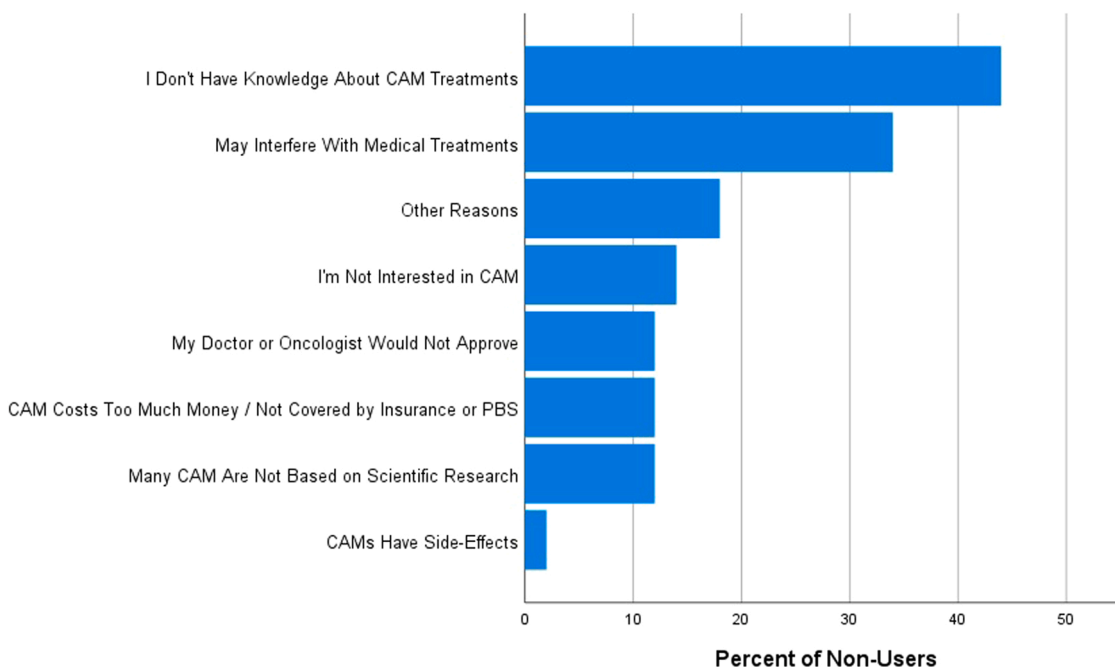

Fig. 2. Reasons against CAM use (multiple responses allowed).

were assured their health professionals would not know the responses of specific patients, that respondents were more comfortable to be honest as to the nature of their cannabis use.

Despite recent legislation in Australia legalising cannabis for medicinal purposes in 2016, it is currently limited to treatment of chemotherapy induced nausea and vomiting, epilepsy, multiple sclerosis, pain and palliative care.[22] The legislation also requires individual approval for patients,[23] which can make obtaining of cannabis in Australia a complex process. While not included in the analysis of the results, the respondents of the survey mostly declined to say where they had obtained their cannabis products, with only one respondent indicating they had sourced from a pharmacy. Interestingly, recent literature from

Canada, Denmark and the United States of America investigating the medicinal use of cannabis by cancer patients shows a range of use between 9.9 % and 29.1 % of respondents.[24–28] The higher respondent use was found in studies carried out in areas where recreational cannabis use has been legalised, such as Washington (24 %)[28] and Canada (18 %[26] and 29.1 %[25]). Moreover, the Canadian study by Hawley and colleagues looked at the use of cannabis before and after the legislation approving the sale for recreational use. They found a statistically significant increase in the disclosure of current cannabis use (23.1 % vs 29.1 %).[25] These observations could suggest that some cancer patients will choose to use cannabis products, regardless of legal restrictions.

The use of cannabis as a complementary therapy with conventional

Table 4
Quality of life score using FACT-G questionnaire.

	CAM users (40) – 1 missing		Non-users (58) – 3 missing		Significance (independent t-test)
	Mean	Standard Deviation	Mean	Standard Deviation	
Physical wellbeing	17.9	6.8	19.4	6.4	0.225
Social/ Family wellbeing	20	5.8	20.4	6.6	0.753
Emotional wellbeing	15.9	5.3	19.2	4.2	**< 0.001**
Functional wellbeing	17.4	6.2	17.2	6.4	0.907
Quality of life	70.1	18.27	76.2	16.3	0.141

cancer treatment could provide some complications in an oncology care setting. There are various anecdotal indications for cannabis for oncology patients, including treating chemotherapy-induced nausea and vomiting, depression, insomnia, anorexia, and cancer-related pain, as well as suggested anti-cancer properties.[29–32] However, much of the evidence for these indications is considered of low quality, with a recent review suggesting that sufficient evidence is only in support of add-on therapy for nausea and vomiting and refractory pain in a palliative setting.[32] Additionally, the various dosage forms of cannabis that can be obtained as well as the different cannabinoids that may be present in these products, increase the variability in this CAM and consequently the difficulty for an oncology health professional to advise when combined with conventional cancer treatment.[32]

When considering recommendations and information on CAM therapies from the Australian literature,[15] CAM users were most likely to seek information through their own research or from friends and family, which concurred with the findings from our study. Given the extent of patients seeking recommendations for CAM use from outside the healthcare system, it does highlight that cancer patients may not be seeking advice from reputable health information sources. The CAM Healthcare model classes cultural practices and community lifestyle (confiding in friends and family), and self-efficacy (conducting one's own research) as 'Predisposing Factors" that would push a person to use CAM,[17] supporting this statement.

At least half of the CAM users in this study said they used CAM to treat their cancer, manage side effects or improve their general health. A systematic review of the literature of CAM use by cancer patients in the last decade found, through thematic analysis, the main motivations to be to "Influence cancer", "Treat cancer complications", "Holistic treatment" and "General Health".[5] Focusing on the Australian studies of the last decade, patterns of use were similar regarding the three major motivations for CAM use identified in our study. The surveys of radiation oncology patients by Hunter et al.[20] and Wilkinson et al.[15] both found that the most prominent motivator for CAM use was to improve the individual's immune system, meanwhile a study published in 2012 by Gillett et al., which surveyed outpatients in a radiation oncology clinic in Toowoomba, Queensland found that the major motivation for CAM users was to improve their Quality-of-Life.[12] This latter observation may explain CAM users scoring lower than non-users regarding their emotional wellbeing. If CAM users are seeking therapies to improve their quality-of-life, then it could be argued that this could be a motivator for using CAM. The CAM Healthcare model classes perceived health status as a 'Need for Care' Factor which would push someone toward the use of CAMs, supporting this observation.[17]

Disclosure and discussion of CAM use by cancer patients with health professionals has been highly variable. Four of the Australian studies of cancer patients in the last decade have looked at disclosure of CAM to health professionals, ranging from 20.4 % to 77 % and with an average of 56.1 %.[12–15] Comparatively, this study found 68 % of CAM users had

disclosed their use. These disclosure rates suggests that patients are wanting to work with their treating team to achieve an optimal treatment outcome. Only one third of CAM users had been asked about these therapies by a health professional, implying some reluctance on the part of health professionals at the TUH to initiate discussion on CAM. This is concerning given the observation that around half of the respondents who gave reasons for not disclosing their CAM use stated it was because they were never asked, which is consistent with the findings by Davis and colleagues in 2012.[8] Health professionals' lack of willingness to discuss CAMs with their patients could also explain why cancer patients are more likely to get recommendations on CAMs from friends and family or their own research.

The motivations of non-CAM users have been less explored in the literature. In this study the main reasons that non-users gave was that they did not have knowledge about CAM or that they were worried about interactions with their cancer treatment. The latter observation is interesting given that concern about interactions was also the main reason CAM users gave for discussing CAM with a health professional. This shows that the safety of CAM use with conventional treatment is an important concern of CAM users and non-users, confirming a role for oncology health professionals in providing information on the safety of CAMs in cancer care. Sullivan and colleagues found that 77 % of non-users agreed that a major reason for not using CAM was that they had never thought about it,[14] similar to the lack of knowledge by non-users in this study. This would also be supported by the CAM healthcare model which classes the availability of CAM literature and self-help information as 'Enabling' factors that would facilitate CAM usage.[17]

As with all studies, there were limitations in our research. Respondents were recruited using convenience sampling, rather than randomisation of responses. This may have introduced some bias into the results. Recruitment was halted due to the COVID-19 pandemic, which reduced potential respondent numbers and resulted in the recruitment period taking place over longer than 12 months. We were also unable to enlist the assistance of interpreters, which limited respondents to those who understood English. Given that the survey respondents were recruited from a day oncology unit, all respondents were undergoing hospital-based treatment. This limited the observations of this study to people using CAMs as complementary therapies and prevented obtaining a perspective from people using CAM as alternative treatments. While this research was limited by research design and ethics, more detailed information on primary cancer sites and stages of cancer diagnoses could have allowed a closer analysis of cancer types in relation to CAM use.

5. Conclusion

This is the first study of CAM use by general cancer patients receiving treatment at a regional centre in North Queensland and thus shares their unique perspectives. While the usage of CAM was found to be lower than previously identified globally, medicinal cannabis was found to be the most used CAM, which is inconsistent with other studies on CAM use in cancer patients. CAM users were also found to have lower emotional wellbeing, potentially supporting our findings that CAM users are more likely to take advice and information on CAM from those close to them, rather than health professionals, who may be able to give an informed perspective when combining CAMs with conventional therapy. Concern amongst CAM users and non-users of the interactions with conventional therapy highlighted the importance of health professionals possessing good CAM knowledge. Continuing education on CAMs for oncology health professionals is therefore important to allow them to have informed conversations with their patients. This would, in turn, encourage patients to view their treating team as a source of information about these therapies and encourage disclosure of CAM use by cancer patients, resulting in safe and holistic treatment outcomes for this population group.

CRediT authorship contribution statement

Martin Keene: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing. **Ian Heslop:** Conceptualization, Supervision, Writing – review & editing. **Sabe Sabesan:** Conceptualization, Supervision, Writing – review & editing. **Beverley Glass:** Conceptualization, Methodology, Funding acquisition, Supervision, Writing – review & editing.

Declarations of Interests

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