


RESEARCH ARTICLE

Knowledge, attitudes, and practices of Australian oncology health professionals on complementary medicines

Martin R. Keene^{1,2,*} , Ian M. Heslop¹, Sabe S. Sabesan¹, Beverley D. Glass¹

¹ College of Medicine and Dentistry, James Cook University, Townsville, Australia

² Albury Base Hospital, East Albury, Australia

Abstract

Background: Approximately half of people with cancer are using complementary and alternative medicine (CAM), presenting safety concerns due to potential interactions with conventional cancer treatment. Oncology staff have a role to play in ensuring the safe use of CAMs and so, this study examined their knowledge, attitudes, and practices regarding CAMs.

Aim: This study aimed to assess the knowledge, attitudes, and practices of Australian doctors, nurses, and pharmacists regarding CAM use in oncology.

Method: Members of three national oncology professional associations took part in an online questionnaire, which determined their knowledge, attitudes, and practices regarding CAM.

Results: Ninety-nine completed surveys were obtained from nine doctors, 70 nurses, and 20 pharmacists. Most respondents (68.4%) felt that they did not have adequate knowledge of CAMs to respond to patients' questions. Assessment of attitudes found respondents generally believed that CAMs have a complementary role in oncology but indicated their concerns for the safety of patients. Respondents indicated in practice they would discuss CAMs with less than half of patients (40.6%), with a lack of scientific data and guidelines for CAM use presenting significant barriers to these discussions.

Conclusion: Our study suggests that oncology health professionals' knowledge of CAMs potentially leads to a lack of confidence in providing advice to patients and concerns for patient safety. This impacts their discussion of CAMs and lack of disclosure from patients about their use of CAMs. Education on CAMs in oncology would assist in increasing professionals' confidence in discussing these therapies, leading to increased patient disclosure of CAMs and safer treatment decision making for people with cancer.

Keywords: knowledge, attitudes, practices, complementary and alternative medicine, oncology.

INTRODUCTION

Complementary and alternative medicine (CAM) use in people with cancer has been on the rise in the past few decades. Prior to the 1990s, these therapies were found to be used in 25% of people with cancer.¹ In the last decade CAM use has increased to an average of 51% of patients,² with use found to be more prominent in people with cancer than in the general population.³

Given this prominence, there are safety concerns for patients receiving conventional anticancer treatment. Biologically based CAMs can affect bleeding risk, such as antiplatelet activity found in garlic and turmeric,⁴ and may alter the pharmacokinetics of chemotherapy

agents. In the latter case, this could potentially lead to reduced therapeutic effect or increased side effects and toxicity.^{5,6} Additionally, around half of people with cancer are not disclosing CAM use to their doctors, citing an assumed lack of interest and knowledge or approval of these therapies.⁷

This prominence necessitates an understanding of the current perspectives of oncology health professionals regarding CAMs. To date, two systematic reviews of the knowledge, attitudes, and practices (KAP) of doctors, nurses, and pharmacists⁸ or nurses alone⁹ regarding CAM in oncology have been published. Generally, health professionals were found to have poor knowledge of CAMs. While nurses were found to be more positive and supportive toward their patients' use of CAMs,^{8,9} oncologists and other doctors have been found to be more inclined to discourage CAM use, and pharmacists were found to be more neutral, with all three professions agreeing there are concerns regarding the

*Address for correspondence: Martin R. Keene, College of Medicine and Dentistry, James Cook University, Townsville, 4811, Queensland, Australia.

E-mail: martin.keene@myjcu.edu.au

safety of combining CAMs with conventional treatment.⁸ However, both reviews also stated that heterogeneity in the design of KAP studies made direct comparison of the findings difficult.^{8,9}

Additionally, prior individual studies in the last decade have either combined professions and assessed their KAPs as a group¹⁰ or focussed on the KAPs of one particular profession.^{8,11,12} The only study identified to assess and contrast the KAPs of different health professionals was by Stub et al.¹³ published in 2018, which compared the KAPs of Norwegian physicians, nurses, and CAM practitioners regarding CAM use in oncology. This study found that doctors and nurses with no formal CAM training were generally concerned about the safety of combining CAMs with conventional cancer therapy as well as being hesitant toward their patients' use of CAMs or having discussions regarding CAMs. This was found to oppose the findings of CAM practitioners and health professionals with formal training in CAM treatments,¹³ suggesting a potential influence of CAM knowledge on attitudes and practices regarding these therapies.

This study thus aims to be the first to investigate the KAPs of doctors, nurses, and pharmacists in oncology regarding CAM use by people with cancer in Australia and will provide insight into the comparative perspectives of each profession.

METHOD

Study Population

The population for this research was members from professional oncology association groups in Australia. Specifically, these were the Clinical Oncology Society of Australia (COSA), the Cancer Nurses Society of Australia (CNSA), and the Specialty Practice Oncology and Haematology Interest Group of the Society of Hospital Pharmacists of Australia (SHPA). According to annual reports from the COSA¹⁴ and CNSA,¹⁵ and correspondence with SHPA, the combined membership of the groups is 2923. Inclusion criteria for participants were doctors, nurses, and pharmacists who are members of professional societies and currently working in oncology. Oncology experience or years in oncology practice were not used as inclusion criteria to maximise engagement with health professionals.

Study Tool Design

The definition of CAMs used in this study is taken from the National Centre for Complementary and Integrative Health (NCCIH). They classify CAMs into three

categories: natural products, which contains herbs and vitamins, that can be taken orally; mind and body practices, which include physical therapies and mindfulness techniques such as meditation and yoga; and other complementary health approaches, which comprises traditional health systems and those not in the other categories, such as Ayurveda, traditional Chinese medicine, and homeopathy.¹⁶

The data collection tool was an online questionnaire to determine respondents' knowledge, attitudes, and practices toward CAM in cancer care. The questionnaire design was primarily based, with permission, on the survey developed by Lee et al.¹⁷ in their 2014 paper that investigated the KAPs of oncologists in the United States regarding herbal supplements in oncology. To assess knowledge, the first section of the questionnaire asked 10 multiple choice questions regarding interactions between CAMs and cancer therapies, and indications for CAM in oncology.

In the second section, to assess attitudes respondents were first given statements relating to CAM use in oncology and asked to indicate their agreement to each statement using a Likert scale. Respondents were also asked to indicate the importance of patient and treatment factors in discussing CAMs with their patients.

The third section of the questionnaire, assessing practices, asked the respondents to indicate the percentage of their patients that they believed were using CAMs, the percentage of their patients with whom they had discussed CAMs, and the percentage of those conversations that they had initiated. Respondents were also asked to indicate how supportive they have been of their patients' use of CAMs and to indicate the perceived barriers to CAM discussions with their patients. For questions that used Likert scales, the majority of responses on the scale were taken as the general attitude or practice of respondents.

The fourth section asked respondents whether they received CAM education in their undergraduate degree. This was followed by questions about their demographics, specifically age, which gender they identify as, the highest level of education they have obtained, and their current profession. The questionnaire was pilot tested with 21 health professionals at the Townsville University Hospital to ensure readability and validity. Responses from the pilot test were not included in the final analysis.

Questionnaire distribution was through the online survey platform SurveyMonkey (Momentive, Waterford, NY, USA). Through the respective individuals in charge of survey distribution to members of the COSA and CNSA, and the SHPA Oncology and Haematology Interest Group's online forum, interested members were

invited to participate in the research through a provided link. This link was to an introductory information page which explained the research and the survey. Consenting participants were taken to the online questionnaire to complete. Members of each group were sent a reminder after two months. This questionnaire was available between February and October 2021.

Data Collection and Statistics

Data from the SurveyMonkey website were downloaded into a Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) spreadsheet and transposed into SPSS Version 25 (IBM Corp, Armonk, NY, USA) for statistical analysis. Chi-squared tests and independent *t*-tests were performed comparing the general responses as well as responses between doctors, nurses, and pharmacists to determine statistical significance.

RESULTS

During recruitment a total of 127 people consented to participate. Seventeen respondents did not complete any questions. A further 11 respondents partially completed the questionnaire and did not indicate their profession. This resulted in 99 questionnaires used in the analysis. Based on the combined memberships of surveyed professional groups, this would allow findings to be stated at a 95% confidence level with a 9.68% margin of error.

From this cohort there were nine doctors, 70 nurses, and 20 pharmacists. Responses to demographic questions can be seen in Table 1. Respondents mostly identified as female and possessed a health-related postgraduate qualification. When comparing the different professions, doctors were more evenly split regarding gender (55.6% male, 44.4% female), which was statistically significant compared to nurses (2.9% male, 97.1% female, $p < 0.001$).

Knowledge

Knowledge was assessed by 10 multiple choice questions regarding interactions of CAMs with conventional cancer treatment and indications for CAMs in cancer care. Most respondents scored 3 or 4 out of 10. When separated into professions, doctors obtained a mean score of 4.6, nurses a mean score of 3.4, and pharmacists a mean score of 5.8. The pharmacists' score was found to be statistically higher compared to nurses ($p < 0.001$, data not shown).

Attitudes

To assess attitudes, respondents were asked to indicate their agreement with statements about the use of CAMs in oncology, which is shown in Figure 1. Most respondents disagreed that CAMs have anticancer properties (74.4%), that most CAMs are safe and free of side effects (69.7%), and that their cultural or religious beliefs influenced their attitudes toward CAMs (68.7%). Just over two-thirds of respondents (68.4%) disagreed that they had enough knowledge about CAMs to answer questions. Most agreed that CAMs could help with side effects of cancer treatment (58.6%), and that CAMs have beneficial effects on psychological (71.8%) and physical symptoms (63.6%). More than three-quarters of respondents (78.8%) agreed that patients spend too much money on CAMs, but that they would support their patient's use of CAMs if no other options were available (84.8%). Lastly, almost all respondents (92.9%) agreed that they were concerned about interactions between CAMs and anticancer treatments.

When comparing professions, pharmacists were statistically more likely to indicate that they knew enough to answer patients' questions on CAMs (75%) compared to nurses (20.2%, $p < 0.001$) and doctors (22%, $p = 0.004$). Compared to pharmacists, nurses were more positive about CAMs helping to alleviate side effects (71.4%

Table 1 Participant demographic data

	Frequency (%)	Doctors, frequency (%)	Nurses, frequency (%)	Pharmacists, frequency (%)
Gender				
Male	14 (14.1%)	5 (55.6%)	2 (2.9%)	7 (35%)
Female	84 (84.8%)	4 (44.4%)	68 (97.1%)	12 (60%)
Prefer not to say	1 (1%)	0	0	1 (5%)
Highest education level				
Health-related postgraduate degree	48 (48.5%)	4 (44.4%)	34 (48.6%)	10 (50%)
Research-related postgraduate degree	8 (8.1%)	3 (33.3%)	4 (5.7%)	1 (5%)
Graduate diploma and graduate certificate	27 (27.3%)	0	24 (34.3%)	3 (15%)
Bachelor's degree	16 (16.2%)	2 (22.2%)	8 (11.4%)	6 (30%)

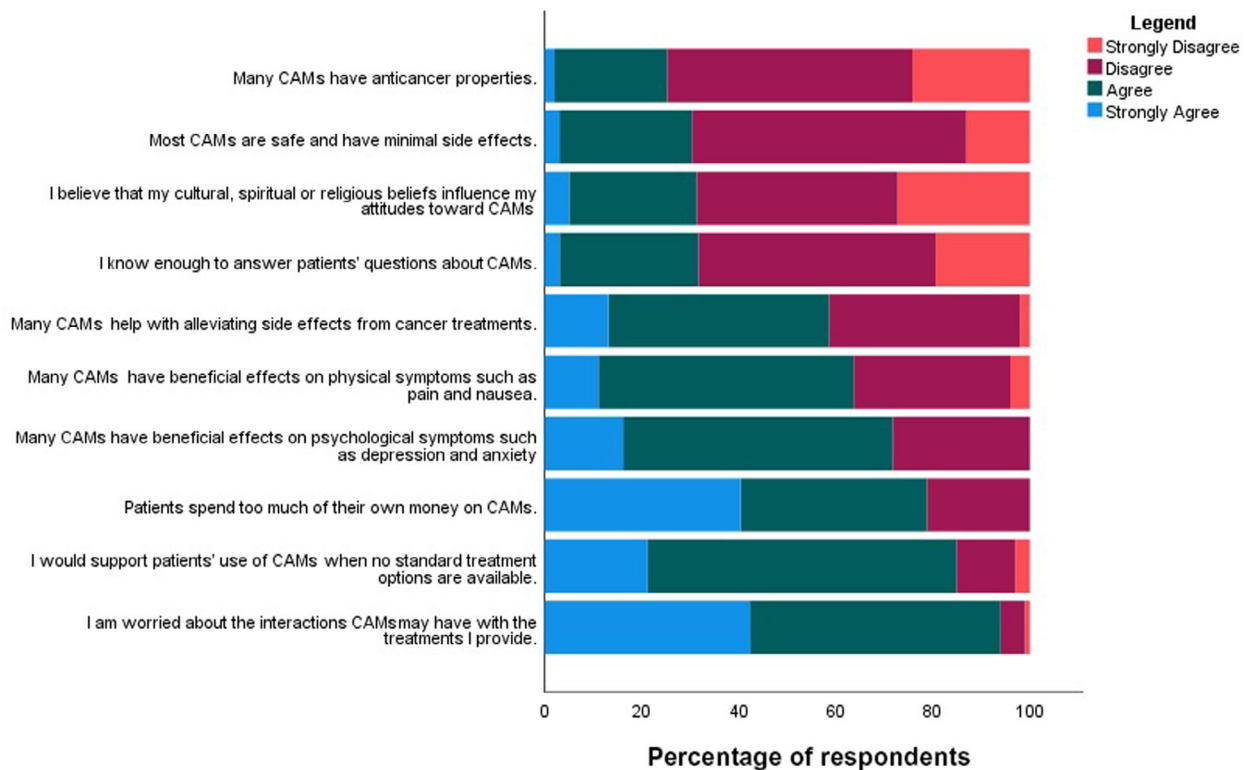


Figure 1 Responses to attitude-related statements.

nurses vs 20% pharmacists, $p < 0.001$), having beneficial effects on psychological symptoms (78.5% nurses vs 40% pharmacists, $p < 0.001$), and physical symptoms (76.3% nurses vs 25% pharmacists, $p < 0.001$).

The last part of this section asked respondents to indicate the importance of certain factors when discussing CAMs with patients. The most prominent factor identified was the safety of CAMs, with all respondents classifying this as 'most important' or 'very important'. This was followed by the efficacy of CAMs (94.9% selecting as 'most' or 'very important'), patient preferences (93.4%), and clinical experience (85.8%, data not shown).

Practices

Practices were first assessed by asking respondents to estimate their patient's use of CAMs and with how many patients they discuss these therapies, summarised in Table 2. The mean number of patients health professionals believed to be using CAMs and the mean number of patients with whom they had discussed CAMs were similar. However, slightly over one-third of discussions regarding CAMs had been initiated by health professionals.

When asked how they would respond during CAM discussions with patients, respondents indicated they

Table 2 Self-estimated practice patterns of respondents

	Mean	Standard deviation
In the past 12 months what is the percentage of your patients or customers with a diagnosis of cancer that currently use CAM? (98 respondents)	41.8	20.6
In the past 12 months, with approximately what percentage of your patients or customers with a diagnosis of cancer have you discussed the topic of CAM? (97 respondents)	40.6	26.8
Please estimate what percentage of these discussions about CAM were initiated by you (90 respondents)	35.9	31.0

would be most inclined to support their patients' CAM use (82.8% would often or sometimes support) than discourage (70.4%) or remain neutral (63.9%). Recommending CAM was close to evenly divided among all health professionals (52.5% would often or sometimes recommend, data not shown).

Table 3 Barriers to discussion of CAM use with people with cancer by all health professionals

	Frequency	Percentage
Do not believe in CAMs	14	14.3%
Limited time during consultation	32	32.7%
No interest in using CAMs	12	12.2%
Lack of scientific data on safety and efficacy	78	79.6%
Lack of professional/hospital guidelines	63	64.3%
Other	18	18.4%

Table 3 shows the barriers health professionals perceived to discussing CAMs with their patients. The two most prominent barriers were a lack of scientific data on safety and efficacy (79.6%) and lack of professional or hospital guidelines (64.3%).

Education

When respondents were asked about education on CAM, almost three-quarters of participants (71.7%) indicated they had not received any in their undergraduate degree. More pharmacists indicated that they had received CAM education (65.0%), which was found to be statistically significant compared to nurses (18.6%, $p < 0.001$, data not shown).

DISCUSSION

This study assessed the knowledge, attitudes and practices of Australian doctors, nurses and pharmacists working in oncology regarding CAM in cancer care. Generally, health professionals scored under 50% on knowledge assessment and felt that they did not know enough about CAMs to answer patient's questions. Assessment of their attitudes showed belief that CAMs could have a role complementary to conventional therapy. However, they also indicated concern about the safety of CAMs. In their practice, most health professionals said they would be inclined to support their patient's CAM use but would discuss CAMs with less than half of their patients. They identified the main barrier to discussing these therapies with their patients was a lack of scientific data on safety and efficacy.

Knowledge, Education and Training

Respondents achieved a general mean knowledge score of 40%, with pharmacists scoring above this average and significantly higher than the nurses. This aligns

with other findings in the study, that significantly more pharmacists received education on CAMs in undergraduate degrees compared to nurses. These observations indicate a fundamental need for training on CAM to increase practitioners' knowledge.

Lee et al.¹⁷ conducted an online questionnaire of oncologists in the United States regarding herbal supplements and found an average score of 1.8 out of 4 (45%) from questions regarding interactions with conventional cancer treatment. This is consistent with our findings of an average of 46% from the doctors. However, Harnett et al.¹⁸ in their 2018 paper surveying Australian community and hospital pharmacists regarding their KAPs toward CAM and cancer, reported an average score of 10 out of 16 (63%), which is slightly higher than our finding of an average of 58% from pharmacists. This discrepancy could be due to the difference in question schedule. As identified in the systematic KAP review of health professionals, the lack of standardisation in questionnaires and the mode of knowledge assessment (self-assessment vs testing) compromises the comparison between studies.⁸

Influence of Knowledge on Attitudes

Despite the knowledge scores, over two-thirds of respondents felt that they did not know enough about CAMs to answer their patients' questions. This suggests that most health professionals are not comfortable in their knowledge of CAMs, which may influence their confidence to have discussions with their patients.

The safety of CAM use in oncology appeared to be a prominent concern from respondents and thus has the potential to affect professional attitudes. Over 90% of respondents agreed to being concerned about interactions and 69.7% disagreed that CAMs are safe. Most respondents also believed that safety is the most important factor when discussing CAMs. Lastly, a lack of data on safety and efficacy were the most commonly identified barriers to CAM discussions. Similar findings were reported in the review of health professions, showing that doctors, nurses, and pharmacists were all concerned about the safety of CAM therapies and their potential interactions with conventional treatment.⁸ These findings highlight that the safety of CAMs for people with cancer is a major concern for these professions and therefore should be a focus of future education. Moreover, it suggests a causal relationship with the findings of the knowledge section. Given that most respondents felt they lacked sufficient knowledge to discuss CAMs with their patients, this could reasonably translate into a conservative view regarding safety. Broom et al.¹⁹ conducted qualitative interviews with oncologists and

oncology nurses in Australia regarding discussing CAMs with their patients. They noted a lack of knowledge tended to result in a conservative view of CAM use due to a perceived potential for interactions, which supports our suggestions.

Conservative views were also found regarding the prevalence of CAMs, as our respondents' average estimation of CAM usage was 41.8% of their patients. This was slightly higher than the estimation range of 25%–40% of patients by doctors in the review of the three professions.⁸ However, a systematic review in 2019, looking at the use of CAMs by oncology patients in the previous decade, found an average global use of 51%.² This suggests that health professionals tend to underestimate how many of their patients are using CAMs.

Regarding attitudes toward the place of CAM in oncology, nurses were significantly more inclined to agree that CAMs were effective in treating the side effects of cancer treatment and the physical and psychological symptoms of cancer, compared to pharmacists, who were overall inclined to be divided. This is similar to the findings of the health professionals review, where nurses generally showed support for CAMs in the treatment of symptoms and side effects, while half of doctors supported CAM use as complementary to conventional treatment, and pharmacists were neutral regarding the use of CAMs for symptomatic relief and improvement in quality of life.⁸

Doctors from our study were mostly divided regarding the role of CAMs in oncology, except for the psychological benefits of CAMs, where they were mostly positive. This is similar to the findings from Beretta et al.¹¹ which surveyed different specialists from Italian hospitals. They found only half of oncologists agreed that CAMs had a role in cancer medicine. Conversely, Yang et al.¹² who surveyed oncologists in China, reported that 95.3% of oncologists were positive toward integrative oncology or the incorporation of CAMs into conventional treatment. It should be noted, however, that over half of the respondents of this survey identified as integrative physicians, which may have influenced this outcome.

Our comparative findings between doctors and nurses is further supported by Broom and Adams,¹⁹ whose interviews suggested that nurses may be more inclined to have a more holistic and patient-centric approach to care regarding CAMs. Respondents expressed views that nurses were more inclined to support a patient's CAM use compared to doctors.

Influence on Practices

Responses to the practice section showed a general trend to be less inclined to engage with patients' CAM

use, with discussion on CAMs occurring on average with 40.6% of patients. This result aligns with the findings of Powers-James et al.²⁰ in their online survey of oncologists in the United States, who stated that respondents talked to an average of 41% of patients about CAMs. Alternatively, the Italian study by Berretta et al.¹¹ found that responding oncologists talked to an average of 49.2% of their patients about CAMs. The reason for the higher percentage in the latter study is not immediately clear, as this was an initial study of KAPs in Italian physicians regarding CAM use by people with cancer.

An average of 36% CAM discussions were initiated by respondents, when taking all three professions together. This is slightly higher than the result from Powers-James et al.²⁰ who found that 25% of responding oncologists were initiating discussions on CAMs. This suggests that oncology health professionals may be reluctant to engage regarding CAMs, relying on patients to broach the subject. This also confirms a previously identified gap in communications between health professional and patients in a systematic review of communication of CAM use in cancer care, where a major reason for patients not disclosing CAMs to their health professionals was that they had not been asked.⁷

The review of health professionals found that doctors and nurses were inclined to support patients who choose to use CAMs, with between 63% and 93% of doctors saying they would support a patient's CAM use.⁸ Our results are within this range, with 82.8% of all respondents saying they would often or sometimes support CAM use. However, it should be noted that the next most likely practice from our surveyed health professionals would be to discourage or remain neutral regarding combining CAMs with conventional therapy, which suggests that responses given by health professionals could be quite variable. This is further illustrated by respondents being divided on their practice of recommending CAMs, which was almost split in half regarding recommending these therapies. The study by Berretta et al.¹¹ did show that 57.6% of oncologists would recommend CAMs, while the review of health professionals suggested that a minority of doctors and nurses would recommend CAMs to their patients.⁸ It should also be noted that 84.8% of respondents in our study agreed that they would support a patient's CAM use when no standard treatment options are available, which suggests that their support in cancer care may vary depending on patient circumstances. This high variability suggests that more research needs to be undertaken to understand how health professionals react to people with cancer using CAMs.

Study Limitations

As with any research, there were limitations to the study. Some of the professions included in this study, namely doctors, were underrepresented compared to others. This may have influenced the findings for this profession and skewed the comparison between groups. Due to the COSA and CNSA survey distribution policies, members were only given one reminder of the questionnaire. This may have limited the potential engagement in our study and subsequently reduced our number of participants.

CONCLUSION

This is the first study, in our knowledge, to compare the knowledge, attitudes, and practices of doctors, nurses, and pharmacists regarding CAM use in oncology, giving a unique perspective of the three professions which play major roles in contemporary cancer care.

Our findings suggest a link between the knowledge, attitudes, and practices of oncology health professionals regarding CAMs. Poor knowledge or a perceived lack of knowledge of CAMs could be attributed to a lack of confidence in discussing CAMs with patients. This would lead to conservative attitudes toward these therapies, driven by concerns over safety when combined with conventional therapy. As a result, this leads to a hesitation to discuss CAMs with patients in practice and varied responses in support of patients' choices to use these therapies. Addressing the knowledge gap for CAMs could have a positive influence on subsequent attitudes and practices. Development of accessible, high-quality, evidenced-based information on CAM use in oncology could improve health professionals' confidence in having discussions with patients and potentially improve health outcomes.

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CONFLICTS OF INTEREST STATEMENT

The authors report no conflicts of interest.

AUTHORSHIP STATEMENT

All authors comply with the *Journal of Pharmacy Practice and Research's* authorship policy.

ETHICS STATEMENT

This project was approved through the James Cook University Human Research Ethics Committee (Reference number: H8279).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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