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Prevalence and Associations for Use of Complementary and Alternative Medicine (CAM) Among Paediatric Cancer Patients in Norway: A Cross-Sectional Survey

Agnete E. Kristoffersen, PhD[1], Trine Stub, PhD[1], Eran Ben-Arye, MD[2], Miek C. Jong, PhD[1], and Dana C. Mora, PhD[1]

Abstract

In Norway, 7,400 individuals diagnosed with childhood cancer before the age of 18 are alive today, facing lasting burdens from the disease and its treatment. This study investigates the prevalence of complementary and alternative medicine (CAM) use among children with cancer in Norway, based on parental reports. It also examines the types of CAM modalities used, their perceived effects, safety, and associated demographic and cancer-related factors. An online cross-sectional survey was conducted in 2021 in collaboration with the Norwegian Children's Cancer Society. The study utilised a modified version of the International Questionnaire to Measure Use of Complementary and Alternative Medicine (I-CAM-Q), adapted for children with cancer. Data were collected from 95 mothers and 22 fathers, covering 117 children, using convenience sampling with a response rate of 17%. Nearly half (47%, n=55) of parents reported that their children used CAM during or after cancer treatment. Modalities included vitamin D supplementation (19%, n=22), music therapy (18%, n=21), art therapy (16%, n=19), psychotherapy (9%, n=10), and massage or aromatherapy (8%, n=9). Although 82% (n = 45) of parents of children using CAM reported benefits, 7% (n = 4) reported adverse effects associated with these modalities. CAM use was primarily motivated by the burden of adverse and late effects of cancer treatment, such as fatigue (p=0.004), worry or unrest (p=0.036), and memory or concentration difficulties (p<0.001). The findings suggest that non-verbal and creative forms of support, such as massage, music therapy, and art therapy, were highly valued in this national sample. Further research is needed to better understand the unmet needs and expectations of both parents and children and to improve the quality of life for children with cancer and their families.

Keywords

CAM, complementary and alternative medicine, complementary medicine, informal caregivers (parents), integrative oncology, Norway, paediatric cancer, and paediatric oncology

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[1]National Research Centre in Complementary and Alternative Medicine (NAFKAM), Department of Community Medicine, Faculty of Health Science, UiT The Arctic University of Norway, Tromsø, Norway
[2]Integrative Oncology Program, Lin, Carmel, and Zebulun Medical Centers, Ruth and Bruch Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

Corresponding author:
Agnete E. Kristoffersen, PhD, NAFKAM, Department of Community Medicine, Faculty of Health Science, UiT The Arctic University of Norway, Hansine Hansens veg 18, Tromsø 9037, Norway.
Email: agnete.kristoffersen@uit.no

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1. Background

Complementary and alternative medicine (CAM) encompasses medical and health practices,[1] systems, and products that are not typically recommended during conventional medicine consultations.[2] In Norway, practices are considered CAM if they are primarily offered outside the public healthcare system, even though some CAM modalities, like art therapy and music therapy, are offered at Norwegian hospitals for specific patient groups.[3] These modalities are mainly offered at hospitals by healthcare personnel (HCP) who are dual-trained (e.g., areas a nurse and art therapist).[4]

Childhood cancer is a rare disease, accounting for 1–4% of all cancers globally.[5] The most common types of childhood cancers include neoplasms of the blood and lymphatic systems, embryonal tumours, as well as tumours affecting the brain, bones, and connective tissues.[6] Advancements in treatment have significantly improved survival rates for many childhood cancers. However, global disparities in survival well known with survival probabilities exceeding 80% in high-income countries, whereas they remain around 30% in low-income countries.[7,8] Cancer remains the second leading cause of death (after accidents) among European children aged 5–14.[9] In Norway, childhood cancer is the leading cause of death among children over the age of one.[10] According to the Norwegian Childhood Cancer Registry, 6,746 Norwegian children and adolescents were diagnosed with cancer between 1993 and 2025, with 212 new cases reported in 2025.[11] The most common types are brain tumours (30%), leukaemia (25%), lymphoma (13%), bone cancer (5%) and neuroblastoma (4%).[11] With a survival rate of 90%,[11] 7,400 individuals in Norway were alive by the end of 2025 after being diagnosed with cancer during childhood or adolescence.[11] However, four out of five of these survivors experience negative long-term effects from the cancer or its treatment.[11]

The high survival rates, prolonged treatment durations, and burden of adverse and long-term effects make the experience profoundly challenging for both patients and their parents.[12,13] Common adverse effects during and shortly after treatment include anaemia, fatigue, infections, mucositis due to immunosuppression, malnutrition, nausea, vomiting, pain, and psychosocial challenges.[12,14] To help their children cope with these challenges, many parents seek additional support beyond conventional medical care.[15,16]

Norway's conventional healthcare system follows the Nordic welfare model, which strongly subsidizes conventional medical treatments offered within the official tax-funded healthcare system with treatment free of charge for children up to 16 years of age.[17] However, some supportive modalities commonly reported for children with cancer, most notably art and music therapy,[18] are also routinely provided within hospital-based paediatric oncology services and are therefore available free of charge to eligible patients.[17] Psychotherapy in Norway is provided within the public healthcare system by licensed psychologists, but is also offered outside the official system by CAM providers such as Gestalt therapists and coaches.[18]

Studies conducted between 1977 and 2015, comprising 61 studies of 7,219 children from 34 countries, report that the prevalence of CAM use, including traditional medicine, among children with cancer varies between 6% and 100%.[16,19] The median estimated prevalence of use was 77% in low-income countries (LIC), 60% in lower-middle income countries (LMIC), and 47% in high-income countries (HIC).[19] The most commonly reported modalities were supplements, dietary changes, visits to a traditional healer, and spiritual modalities. The rationale for use was that parents wanted to do everything possible for their child by boosting the immune system, improving general well-being, and treating adverse effects from conventional cancer treatment.

In Europe, knowledge about CAM use in paediatric cancer care is limited. Since 2018, only three studies in Europe have investigated CAM use in paediatric cancer patients.[20-22] The prevalence of use ranges from 47% in France[20] to 56% in the Netherlands,[21] with a notably high prevalence of 69.3% reported at a Swiss paediatric haematology-oncology centre.[22] The most commonly used modalities across these countries were oral supplements and homeopathy.

In Norway, two earlier studies have examined CAM use among children with cancer. A 1992 study involving 31 children estimated CAM use to be between 30% and 60%, with herbal medicines, religious practices, and dietary supplements being the most commonly reported modalities.[23] A 2007 qualitative study explored CAM use among 21 families of children with cancer, highlighting the use of herbs and supplements. This study found that parents were cautious about giving herbs and supplements to their children due to concerns about potential negative interactions with conventional treatments.[24] Additionally, a 2016 Norwegian study reported that 5% of parents in the general population consulted a CAM provider for their children's health problems annually. Furthermore, 15.7% of parents gave their children supplements, herbs, or natural health products.[25]

Given the considerable time that has elapsed since the last Norwegian study was conducted, together with the limited sample sizes of existing studies, this study aimed to explore the current prevalence of CAM use among children in Norway diagnosed with cancer, based on parent-reported information. It also examines the types of CAM modalities used, their perceived effects and safety profiles, as well as the demographic and cancer-related factors associated with CAM use.

2. Methods

An online cross-sectional survey was conducted throughout 2021 in collaboration with the Norwegian Children's Cancer Society, a nationwide organisation that provides guidance and support to families who currently have, or have previously had, children with cancer. The survey targeted 700 active members and utilised the Norwegian adaptation[26] of the International Questionnaire to Measure Use of Complementary and Alternative Medicine (I-CAM-Q),[27] which includes separate adaptations for cancer contexts[28] and for paediatric populations.

2.1. Participants (inclusion and exclusion criteria)

To be eligible for inclusion, participants had to be at least 18 years old, and be a parent of a child diagnosed with cancer before the age of 18 within the preceding 30 years. Only one parent per child was eligible to participate in the study. Former paediatric oncology patients who were now adults were not invited to participate, nor were other informal caregivers, such as grandparents, family members, or friends, as the study focused exclusively on parents and their child with cancer.

2.2. Data collection

Participants were recruited using convenience sampling,[29] a non-probability method in which respondents are selected because they are readily available. The data collection followed Dillman's survey method, which emphasizes tailored design to maximize response rates through clear communication, multiple contact attempts, and user-friendly survey formats.[30] One week before the survey was distributed, the Norwegian Children's Cancer Society sent an email to prepare participants for the upcoming survey. The survey itself was distributed via an invitation letter containing a link to the online questionnaire, which was designed and managed using Nettskjema.no.[31] Additionally, two reminder emails were sent after the initial distribution to encourage participation. The invitation was further shared with all members through three editions of the organisation's quarterly newsletter. The Norwegian Children's Cancer Society had approximately 1,900 registered family members; about 700 were 'active' at the time of the study (as defined by the Society) and were expected to receive the invitation. Because the exact number of eligible members who actually received or saw the invitation is unknown (e.g., undeliverable emails, spam filters), the response-rate denominator was treated as an estimate.

The survey link was also shared on three separate occasions in 2021 via the Facebook pages of the 13 regional local chapters of the Norwegian Children's Cancer Society. Additionally, the investigators partnered with the childhood oncology unit at the University Hospital of Northern Norway, where informational pamphlets were distributed to parents of hospitalised children. To further enhance outreach, the survey was promoted on the social media platforms of the National Research Centre in Complementary and Alternative Medicine in Norway (NAFKAM). The survey platform did not block duplicate submissions; the final dataset was screened for duplicate or implausible entries, and none were retained in the analytic sample. As an incentive to encourage participation, respondents were offered the opportunity to enter a lottery when completed the survey. Twelve gift cards, each valued at 1,000 NOK, were randomly awarded to participants.

2.3. Questionnaire content

The questionnaire used in the survey was adapted from the Norwegian version[26] of the validated International Questionnaire to Measure Use of Complementary and Alternative Medicine (I-CAM-Q).[27] The previously developed cancer-specific I-CAM-Q[28] served as the basis for our instrument, which was then further refined using interviews with parents of children with cancer in Norway conducted two years prior to this survey,[32] and an integrative review on the information and communication needs of parents of children with cancer regarding the use of CAM.[33,34] The chief adviser for scientific development at the Norwegian Children's Cancer Society reviewed the questionnaire and provided feedback, which was incorporated into the final version of the questionnaire.

2.4. Measures

2.4.1. Personal characteristics

The gender of the parents and children with cancer was determined by asking the parents to identify as a woman or man and to indicate whether their child was a girl or boy. The parents' age at the time of the survey was obtained as a continuous variable. In the analysis, the parents' age was categorised into three groups (26-40 years, 41-50 years, and 51-62 years), representing the age span of the parents. Level of parental education was recorded using six levels: primary education (up to 10 years), upper secondary education (from 11-13 years), lower levels at university/college (up to 4 years), higher levels at university/

college (more than 4 years), and don't know, and refuse to answer. These were merged into a measure with four categories; less than 13 years of education, college/university less than 4 years, college/university 4 years or more, and refuse to answer, as none of the parents answered "don't know." Household income was collected using the following categories: NOK <150,000, 150,000-250,000; 251,000-350,000; 351,000-450,000; 451,000-550,000; 551,000-750,000; 751,000-1,000,000; and more than NOK 1,000,000, don't know, and refuse to answer. These were re-categorised into low (< NOK 550,000/USD 55,000), middle (NOK 550,000 – 1,000,000/USD 55,100-100,000), high household income (>NOK 1,000,000/>USD 100,000), and refuse to answer. None of the respondents checked "don't know." Other personal characteristics included location (city (more than 50,000 inhabitants), town (between 10,000 and 50,000), village (less than 10,000), rural area, don't know, and refuse to answer).

2.4.2. Cancer diagnosis and treatment

The parents were asked about their child's cancer diagnoses (leukaemia, lymphoma, neuroblastoma, bone cancer, Wilms tumour of the kidney, soft-tissue sarcoma, retinoblastoma, germ cell tumour, other, don't know), and which treatment the child had received (chemotherapy, surgery, radiotherapy, stem cell/bone marrow transplantation, antibody treatment, cancer treatment with hormones, and/or other, and don't know). Parents were further asked to mark adverse effects experienced by the child due to cancer treatment (i.e. weakened immune system, poor appetite) while the recurrence of cancer was assessed by asking if the child had cancer again after the first time (yes/no). The child's age when diagnosed with cancer was asked as a continuous variable and then grouped into three categories (0-5 years, 6-10 years, and 11-16 years representing the age range of the children in the study). The survey inquired about the child's age at the time of the study as a continuous variable. If the child was no longer undergoing treatment, the age at which the child entered remission was also requested. Additionally, parents were asked to confirm if the child was still alive (yes/no), and if not, to provide the age at which the child passed away.

2.4.3. Overall health of the child

A Likert scale was used to measure the child's overall health (very good, good, neither good nor bad, bad, very bad), their health compared with other children the same age (better health, similar health, poorer health, don't know), and the extent to which cancer treatment affected the child's cognitive development (minimally, to some extent, very much, don't know).

For analysis we collapsed categories to improve cell sizes and support meaningful comparisons. "Overall health" was grouped as very good/good, neither good nor bad, and bad/very bad. "Health compared with others" was grouped as better/similar health, poorer health, and don't know. Three respondents (2.6%) did not answer the overall-health item because their child had died; these responses were treated as missing.

2.4.4. Complementary and alternative medicine (CAM)

The questionnaire measured various CAM modalities used by the children with the following question: *Has the child used any of the following to help reduce health challenges resulting from cancer diagnosis or treatment? (Please mark all that apply)*: *Provider-based therapies* (acupuncture, healing, homeopathy, massage/aromatherapy, psychotherapy, reflexology); *natural remedies/dietary supplements (*vitamins B, C, D, and E, turmeric garlic, blueberry extract, ginger*)*, and *self-care practices (*meditation, music therapy (both listening/playing), art therapy (drawing), and yoga).[35]

Psychotherapy in Norway is offered by both licensed health professionals (psychologists) and CAM providers (e.g., gestalt therapists).[18] In this paper, psychotherapy is considered part of the CAM outcomes; however, the tables also include footnotes presenting percentages of CAM use excluding psychotherapy. Additionally, as art and music therapists are not licensed HCP in Norway, their practices are classified as CAM in line with the Norwegian Act regarding alternative treatment for diseases.[3]

For each modality or category, respondents were asked whether they had used it to address specific symptoms, such as pain, fatigue, nausea, or vomiting. Respondents were also asked to indicate whether each care modality had any impact (yes/no) and, if it had, to specify the outcome as one of the following: symptoms cured, symptoms reduced, no change, or unsure. Furthermore, for each modality used, they were asked to report whether any adverse effects were experienced (yes/no). For *self-care practices*, parents were asked whether these practices were used for a specific reason (yes/no) and, if so, to indicate the reasons for use (e.g., maintaining a normal routine, helping the family focus on something else, taking a break from the illness/hospital, benefiting the child, or "I don't know"). Parents were further asked whether the CAM modalities were used during active cancer treatment (while receiving cancer treatment, e.g., chemotherapy, radiotherapy, etc), after cancer treatment (once the child ended cancer treatment), and/or during palliative care (end-of-life care received while the child was in a terminal phase).

2.5. Statistical methods

Descriptive statistics, including frequencies and percentages, were used to summarize the sample characteristics and the prevalence of CAM modalities among respondents. The prevalence of CAM use was compared across groups using the Pearson chi-square test for categorical variables with larger sample sizes, and Fisher's exact test was applied for smaller sample sizes or sparse data. For continuous variables, independent-samples *t*-tests and Mann–Whitney *U* tests were conducted. Missing data were handled using a complete-case approach: observations with missing values on variables required for a given analysis were excluded from that analysis. All statistical analyses were performed using SPSS version 28.0.1.0, with p-values <0.05 considered statistically significant.

3. Results

3.1. Participant characteristics

A total of 117 responses were received from the survey, resulting in a response rate of 17%. The respondents were parents of children with cancer, reporting on their child's use of CAM. Of 117 respondents, 21.4% (n=25) reported that their child was still undergoing cancer treatment at the time of survey completion. Among the 89 parents whose child had completed therapy and was alive at survey completion, the recall window ranged from 0–30 years: 60.7% (n=54) completed the survey within 0–5 years after the end of their child's therapy, 22.5% (n=20) within 6–10 years, and 16.9% (n=15) more than 10 years after end of therapy. An additional 3 parents (2.6%) reported their child had died; timing of death was not recorded. The majority of respondents were mothers (81%, n = 95), with a mean parental age of 43 years (SD = 7.98) at the time of the study (Table 1). Most parents had attended university or college (71%, n = 83), and 43% (n = 50) had completed four or more years of university education. Similarly, 43% (n = 50) of parents reported a household income exceeding NOK 1,000,000 (USD 100,000) (Table 1). More than half of the participants (58%, n = 68) lived in cities or towns. Among the children with cancer, 52% (n = 61) were female, and 61% (n = 71) were diagnosed with cancer between the ages of 0 and 5. The overall age range of diagnosis spanned from 0 to 16 years (Table 1). The most commonly reported cancer diagnoses were leukaemia (53%, n = 62) and brain cancer (15%, n = 18) (Table 2). Most children underwent chemotherapy (94%, n = 110), surgery (37%, n = 42), and/or radiotherapy (27%, n = 32). Adverse effects from conventional cancer treatment were reported for all children (100%, n = 117). A median of 8 different adverse and late effects was reported (IQR = 7), with the number of complaints ranging from 1 to 22 per child. Most frequently reported were weakened immune system (73%, n = 85), poor appetite (70%, n = 82), nausea and vomiting (70%, n = 82), pain (68%, n = 78), and fatigue (61%, n = 71). Additionally, 17% (n = 20) of parents reported cancer recurrence in their child (Table 2).

3.2. Use of CAM

Nearly half of the parents (47%, n = 55) reported that their child utilised various CAM modalities throughout their cancer journey. Specifically, 27% (n = 31) of children used natural remedies or supplements, while 21% (n = 24) received treatment from CAM providers. Similarly, 21% (n = 24) participated in self-care practices. The number of CAM modalities used ranged from one to five, with an average of 2.15 (SD = 1.11) modalities per child (Table 3). The most frequently used CAM modalities included vitamin D supplementation (19%, n = 22), music therapy (18%, n = 21), art therapy (16%, n = 19), psychotherapy (9%, n = 10), and massage or aromatherapy (8%, n = 9) (Table 3). Vitamin D supplementation was primarily used to address issues such as poor appetite, fatigue, and a weakened immune system. Activities such as drawing and playing music were adopted not only because they were familiar within the family and surrounding environment but also because they were perceived as beneficial to the child's health. Psychotherapy was utilised to address concerns such as worry and psychological reactions, while massage and aromatherapy were primarily employed to alleviate pain. Psychotherapy can be considered CAM in Norway, depending on the provider's qualifications. A sensitivity analysis was conducted to account for this classification and is presented at the bottom of Table 3. Among parents reporting their child's CAM use, 82% (n=45) reported that the modality used had an effect. Among those who found the CAM modalities effective, 53% (n = 24) indicated they reduced symptoms, 11% (n = 5) reported symptoms were cured, and 36% (n = 16) did not specify how the modalities were beneficial. However, 7.3% (n = 4) reported that their child experienced adverse effects from the CAM modalities. These events were associated with psychotherapy (n = 1), reflexology (n = 1), vitamin D (n = 1), vitamin E (n = 1), and unspecified vitamins (n = 1) (Table 3). The time associated with CAM use varied, with 70% (n = 40) of children using CAM during cancer treatment and 80% (n = 44) using CAM post treatment and (Table 3). Parents who organized CAM treatment for their children were significantly more likely to do so if their child experienced specific symptoms, such as shortness of breath (71%, n = 15), worry (62%, n = 34), fatigue (58%, n = 41), and difficulties with memory and concentration (67%, n = 31),

Table 1. Characteristics of study participants (the parents as well as their children with cancer) and the associations with the child's usage of complementary and alternative medicine

Characteristics of respondents (parents)	Total		Child used CAM		Child did not use CAM		p-value
	(n=117)		(n=55)		(n=62)		
	%	N	%	N	%	n	
Parent's role							0.267*
Mothers	81.2	95	49.5	47	50.5	48	
Fathers	18.8	22	36.4	8	63.6	14	
Parent's age							0.415*
26-40	37.6	44	54.5	24	45.5	20	
41-50	42.7	50	44.0	22	56.0	28	
51-62	19.7	23	39.1	9	60.9	14	
Mean age (years, SD)	43.2 (7.98)		42.3 (7.90)		44.0 (8.03)		0.255§
Education Level							0.366^
Less than 13 years of education	25.6	30	36.7	11	63.3	19	
College/university (≤4 yrs)	28.2	33	54.5	18	45.5	15	
College/university (>4 yrs)	42.7	50	46.0	23	54.0	27	
Refused to answer	3.4	4	75.0	3	25.0	1	
Household income							0.163^
Low (< NOK 550,000)	17.1	20	30.0	6	70.0	14	
Middle (NOK 550,000 to 1,000,000)	35.9	42	42.9	18	57.1	24	
High (>NOK1,000,000)	42.7	50	58.0	29	42.0	21	
Refused to answer	4.3	5	40.0	2	60.0	3	
Area of residence							0.564*
City (>50,000)	29.1	34	50.0	17	50.0	17	
Town (10,000 - 50,000)	29.1	34	52.9	18	47.1	16	
Village (<10,000)	23.9	28	35.7	10	64.3	18	
Rural area	17.9	21	47.6	10	52.9	11	
Characteristics of the patient (children with cancer)	Total (n=117)		Used CAM (n=55)		Did not use CAM (62)		p-value
Child's sex							0.218*
Female	52.1	61	41.1	23	47.5	29	
Male	47.9	56	52.5	32	58.9	33	
Age at cancer diagnosis							0.859*
0-5 years	60.7	71	46.5	33	53.5	38	
6-10 years	24.8	29	44.8	13	55.2	16	
11-16 years	14.5	17	52.9	9	47.1	8	
Mean age (Years, SD)	1.5 (0.74)		5.6 (4.04)		4.9 (3.97)		0.316§

*Pearson chi-square test; ^Fisher exact test.
§Independent sample t-test.

compared to children without these symptoms ($p<0.05$, Table 3). Parents reported using CAM to address symptoms including worry and shortness of breath, as well as fatigue and difficulties with memory and concentration.

Children who used CAM had a higher adverse/late-effects index than those who did not, although the difference was not statistically significant. Children who used CAM (n = 55) had a median of 8 adverse/late effects (IQR = 10, range 1–22), compared with a median of 7 (IQR = 6, range 2–18) in children who did not use CAM (n = 62). Mann–Whitney U = 1397.5, Z = −1.685, two-tailed p = 0.092 (Monte Carlo p = 0.088, 99% CI 0.083–0.094). The rank-based effect size was small (r = 0.16), indicating a small difference in distributions.

Table 2. Health characteristics of children with cancer as reported by their parents, and their associations with complementary and alternative medicine usage

	Total		Child used CAM		Child did not use CAM		
	%	n	%	n	%	n	p-value
Cancer diagnosis							
Leukemia	53.0	62	50.0	31	50.0	31	0.491*
Brain	15.4	18	55.6	10	44.4	8	0.430*
Wilms kidney tumor	7.7	9	33.3	3	66.7	6	0.498^
Neuroblastoma	6.8	8	25.0	2	75.0	6	0.279^
Lymphoma	6.0	7	42.9	3	57.1	4	1.000^
Bone cancer	3.4	4	50.0	2	50.0	2	1.000^
Soft-tissue sarcoma	2.6	3	33.3	1	66.7	2	1.000^
Retinoblastoma	1.7	2	0.0	0	100	2	0.497^
Germ cell tumor	0.9	1	100	1	0.0	0	0.470^
Other	4.3	5	40.0	2	60.0	3	1.000^
Don't know	0.9	1	100	1	0.0	0	0.470^
Cancer treatment							
Chemotherapy	94.0	110	47.3	52	52.7	58	1.000^
Surgery	36.8	42	46.5	20	53.5	23	0.935*
Radiotherapy	27.4	32	53.1	17	46.9	15	0.416*
Stem cell/bone marrow transplantation	16.2	19	47.4	9	52.6	10	0.973*
Antibody treatment	6.8	8	62.5	5	37.5	3	0.472^
Cancer treatment with hormones	3.4	4	100	4	0.00	0	0.046^
Other	3.4	4	0.0	0	100	4	0.121^
Don't know	0.9	1	0.0	0	100	1	1.000^
Adverse and late effects from cancer and cancer treatment							
Weakened immune system	72.6	85	44.7	38	55.3	47	0.416*
Poor appetite	70.1	82	47.6	39	52.4	43	0.855*
Nausea/vomiting	70.1	82	42.7	35	57.3	47	0.151*
Pain	66.7	78	47.4	37	52.6	41	0.896*
Fatigue	60.7	71	57.7	41	42.3	30	0.004*
Feeling worried (unrest)	47.0	55	61.8	34	38.2	21	0.003*
Sleep disorders	47.0	55	54.5	30	45.5	25	0.124*
Difficulty with memory and concentration	39.3	46	67.4	31	32.6	15	<0.001*
Dry mouth	38.5	45	44.4	20	55.6	25	0.660*
Feeling sad	35.9	42	52.4	22	47.6	20	0.384*
Dental problems	31.6	37	54.1	20	45.9	17	0.299*
Psychological reactions	31.6	37	59.5	22	40.5	15	0.066*
Sleepiness (drowsiness)	28.2	33	57.6	19	42.4	14	0.151*
Hormone changes	23.1	27	55.6	15	44.4	12	0.310*
Neuralgia	23.1	27	51.9	14	48.1	13	0.565*
Numbness/tingling	22.2	26	57.7	15	42.3	11	0.216*
Shortness of breath	17.9	21	71.4	15	28.6	6	0.013*
Muscle cramps	17.1	20	40.0	8	60.0	12	0.490*
Reduced fertility	14.5	17	58.8	10	41.2	7	0.291*
Hearing problems	13.7	16	37.5	6	62.5	10	0.412*
Lung problems	13.7	16	68.8	11	31.2	5	0.061*
Osteoporosis	8.5	10	60.0	6	40.0	4	0.513^
Radiation damage	7.7	9	66.7	6	33.3	3	0.303^
Lymphedema	6.8	8	75.0	6	25.0	2	0.145^
Heart diseased	5.1	6	66.7	4	33.3	2	0.418^
Other	12.0	14	35.7	5	64.3	9	0.367*
Cancer reoccurrence							0.428*
Yes	17.1	20	55.0	11	45.0	9	
No	81.2	95	45.3	43	54.7	52	
Child overall health							0.068*

(continued)

Table 2. (continued)

	Total		Child used CAM		Child did not use CAM		
	%	n	%	n	%	n	p-value
Very good/Good	70.1	82	40.2	33	59.8	49	
Neither good nor bad	15.4	18	55.6	10	44.4	8	
Bad/Very bad	12.0	14	71.4	10	28.6	4	
Health compared to others his/her age							0.181^
Better/Similar health	41.9	49	36.7	18	63.3	31	
Poorer health	52.1	61	54.1	33	45.9	28	
Don't know	3.4	4	50.0	2	50.0	2	
Effect on cognitive development by cancer							0.246^
Minimal	39.3	46	37.0	17	63.0	29	
To some extent	38.5	45	51.1	23	48.9	22	
Very much	16.2	19	63.2	12	36.8	7	
Don't know	6.0	7	42.9	3	57.1	4	

*Pearson chi-square test; ^Fisher exact test.

4. Discussion

The study found that many parents (47%, n=55) actively sought CAM to mitigate the adverse and late effects experienced by their children during (70%), as well as after (80%) anti-cancer treatment. Parents reported using CAM to address symptoms including worry and shortness of breath, as well as fatigue and difficulties with memory and concentration. Among parents whose children used CAM, 82% (n = 45) reported that the therapies were beneficial. Adverse effects associated with these modalities were reported in fewer than 8% of cases.

The findings of our study are consistent with the prevalence rates of CAM use reported among children with cancer in other high-income countries.[19,21,36-39] Studies conducted in Switzerland,[22,36] France,[20] the Netherlands,[21] and the United States[38] indicate that the use of CAM in paediatric oncology patients varies broadly, with reported rates ranging from 35% to 70%.

In this study, the most frequently used CAM modalities included vitamin supplementation, art and music therapy, psychotherapy, and massage/aromatherapy. The prominent use of vitamins resonates with findings from prior research[21,36,38,39] which consistently highlight vitamins as a commonly chosen CAM modality in children with cancer. For instance, Sanchez et al observed that vitamins were utilised by 15% of their study's participants.

Vitamin D deficiency is widely recognised as the most common nutritional deficiency, and studies have shown that vitamin D deficiency is more prevalent in children with haematological malignancies compared to their healthy peers.[40-43] In the present study, vitamin D was provided for 19% (n=22) of children. It was primarily used to address issues such as poor appetite, fatigue, and a weakened immune system. The importance of vitamin D in cancer pathogenesis has gained increasing recognition for its positive effects on bone health and for strengthening the immune system.[43] Guidelines recommend a daily intake of 10µg to 15µg for children under the age of 18.[44] Vitamin D is found in many types of fish, with the highest concentrations present in fatty fish species such as salmon, trout, mackerel, halibut, herring, and plaice. However, the frequent difficulties children with cancer face in meeting their nutritional needs[43] may have contributed to the use of vitamin D to address issues related to the child's poor appetite.

In addition to addressing physical health, our research also highlighted the importance of emotional and psychological well-being and the need for such support. We found that 18% of the children engaged in music as a way to maintain a sense of normalcy and to offer a much-needed respite from their illness and hospital stay during cancer treatment.[45,46] In a qualitative study conducted by the same research team,[18] music was used to strengthen family relationships and allow the children to express their emotions. For example, a participant who was a music therapist at the hospital treated a little girl who stopped talking after surgery. During a music therapy session, a week after surgery, the music therapist and the girl were looking for the girl's voice. They found the voice inside the guitar by playing lullabies. Having found her voice, the girl started to talk again. Moreover, music therapy has been documented to enhance the overall well-being of paediatric cancer patients as well as alleviate distress, anxiety, and pain.[47,48] Although no previous studies have reported on the specific prevalence of music therapy among paediatric oncology patients, there is a consensus that music therapy is widely utilised in paediatric oncology globally.[49,50] Similarly, 16% of the parents in this study reported using art therapy, such as drawing, for the same reasons as playing music. Drawing provides a natural form of expression for children who may struggle to verbally articulate their

Table 3. Use of complementary and alternative medicine among children with cancer as reported by their parents

Total use		Self-reported effect from modality				Self-reported effect on symptoms*								Self-reported adverse effects*				When was treatment used¥					
		Yes		No		Cured		Reduced		No change		Don't know		Yes		No		During cancer treatment		After cancer treatment		Palliative care	
%	n§	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	
CAM Provider	20.5	24	97.7	22	8.3	2	4.5	1	95.5	21	0.0	0	9.1	2	8.3	2	91.7	22	58.3	14	75.0	18	4.2	1
Psychotherapy^	8.5	10	80.0	8	20.0	2	0.0	0	80.0	8	0.0	0	0.0	0	10.0	1	90.0	9	70.0	7	70.0	7	10.0	1
Massage/aromatherapy	7.7	9	88.9	8	11.1	1	0.0	0	88.9	8	0.0	0	0.0	0	0.0	0	100	9	33.3	3	88.9	8	11.1	1
Acupuncture	3.4	4	100	4	0.0	0	25.0	1	75.0	3	0.0	0	0.0	0	0.0	0	100	4	25.0	1	75.0	3	0.0	0
Healing	2.6	3	100	3	0.0	0	0.0	0	33.3	1	0.0	0	66.7	2	0.0	0	100	3	100	3	66.7	2	0.0	0
Homeopathy	0.9	1	0.0	0	100	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	100	1	0.0	0	100	1	0.0	0
Reflexology	0.9	1	0.0	0	100	1	0.0	0	0.0	0	0.0	0	0.0	0	100	1	0.0	0	0.0	0	100	1	0.0	0
Touch assist therapy	0.9	1	100	1	0.0	0	0.0	0	100	1	0.0	0	0.0	0	0.0	0	100	1	100	1	0.0	0	0.0	0
Natural remedies/ supplements	26.5	31	71.0	22	29.0	9	18.2	4	40.9	9	9.1	2	50.0	11	6.5	2	93.5	29	45.2	14	80.6	25	6.5	2
Vitamin D	18.8	22	68.2	15	31.8	7	9.1	2	22.7	5	9.1	2	0.0	0	4.5	1	95.5	21	40.9	9	77.3	17	9.1	2
Vitamin C	7.7	9	77.8	7	22.2	2	0.0	0	22.2	2	11.1	1	0.0	4	0.0	0	100	9	55.6	5	88.9	8	11.1	1
Vitamin B	1.7	2	50.0	1	50.0	1	0.0	0	0.0	0	0.0	0	50.0	1	0.0	0	50.0	1	100	2	50.0	1	50.0	1
Vitamin E	1.7	2	50.0	1	50.0	1	50.0	1	0.0	0	0.0	0	0.0	0	50.0	1	50.0	1	100	2	0.0	0	50.0	1
Other vitamins	5.1	6	100	6	0.0	0	33.3	2	50.0	3	0.0	0	66.7	1	16.7	1	83.3	5	66.7	4	100	6	0.0	0
Turmeric	1.7	2	100	2	0.0	0	0.0	0	0.0	0	0.0	0	100	2	0.0	0	100	2	50.0	1	50.0	1	0.0	0
Garlic	1.7	2	50.0	1	50.0	1	0.0	0	0.0	0	0.0	0	100	1	0.0	0	100	2	0.0	0	50.0	1	0.0	0
Blueberries/extract	1.7	2	100	2	0.0	0	0.0	0	50.0	1	0.0	0	50.0	1	0.0	0	100	2	50.0	1	50.0	1	0.0	0
Ginger	0.9	1	100	1	0.0	0	0.0	0	0.0	0	0.0	0	100	1	0.0	0	100	1	0.0	0	0.0	0	0.0	0
Other supplements	2.6	3	100	3	0.0	0	66.7	2	33.3	1	0.0	0	0.0	0	0.0	0	100	3	100	3	66.7	2	0.0	0
Self-help practices	20.5	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95.8	23	70.8	17	8.3	2
Music therapy	17.9	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95.2	20	76.2	16	9.5	2
Art therapy	16.2	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94.7	18	78.9	15	5.3	1
Yoga	0.9	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	1	0.0	0	0.0	0
Meditation	0.0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of CAM	**47.0**	**55**	**81.8**	**45**	**18.2**	**10**	**11.1**	**5**	**53.3**	**24**	**6.7**	**3**	**28.9**	**13**	**7.3**	**4**	**92.7**	**51**	**72.7**	**40**	**80.0**	**44**	**5.5**	**3**

*Due to missing responses, the numbers do not always amount to the total number of users for each modality; ^ Psychotherapy is offered both by authorized health care providers (psychologists and psychiatrists, not CAM) and by CAM providers (CAM). The use of psychotherapy is included in the calculation of CAM in the table. If psychotherapy was excluded, the percentage of CAM users would decrease from 47% to 36.3% and use of CAM providers from 20.5% to 12.8%; - effect and adverse effects were not collected for self-help practices. §This column contains the denominator for the assessment of the percentages in the remaining columns. ¥ Survey participants could have checked more than one category.

thoughts and feelings.[51] It has been increasingly recognized as an effective treatment for reducing depression and anxiety in children with cancer.[52,53] While detailed studies on the prevalence of art and music therapy in paediatric oncology are scarce, a recent study indicated that 5.2% of Norwegian somatic hospitals offer art and expression therapy to their patients.[4] In the qualitative study mentioned above,[18] modalities like play, psychodrama therapy, music, and virtual reality programmes were often used for stress management, to divert the attention of children from painful procedures, treatment regimens, and the burden of having a cancer diagnosis. At the hospital, children played to process emotions, and through role-play they coped with their situation. Using techniques such as role-play, the HCP helped children to process their emotions. The playroom was a safe space where patients and their parents could freely express their emotions without restraint. The notable prevalence of psychotherapy as a frequently utilised modality in this study may reflect a distinctive characteristic of the Norwegian context.[16,21,36,38,39] Parents who sought psychotherapy for their children often did so to address concerns such as worries and psychological reactions. These findings align with existing literature, which highlights that children with chronic physical conditions, including cancer, face an increased risk of psychological challenges such as anxiety and depression.[54] Children with cancer frequently endure persistent pain, often resulting in extended hospital stays.[55] In the present study, massage and aromatherapy were used primarily to alleviate pain following the completion of cancer treatment. Most parents found these modalities beneficial for their children. This aligns with previous research demonstrating the effectiveness of massage and aromatherapy in reducing pain among paediatric cancer patients[55-57] using essential oils such as peppermint,[55] lavender, orange, juniper berry, patchouli, and ylang-ylang.[58]

Consistent with previous research,[36,38,39] a significant proportion of parents (53%, n=24) reported a positive impact of CAM modalities on their children's well-being. Notably, of the 55 participants, 82% (n = 45) found CAM beneficial, with 53% (n = 24) specifically reporting a reduction in the severity of symptoms related to cancer treatments. These findings are consistent with a Swiss study, in which 87% of parents reported benefits from their child's CAM use. Specifically, 76% observed improvements in their child's overall health, while 54% noted a reduction in adverse effects related to chemotherapy and radiotherapy.[36]

Our findings also parallel those of Laengler et al,[39] in which less than 8% of parents reported adverse effects from their child's use of CAM. In the present study only four parents reported adverse effects attributed to their child's CAM use, including muscle pain, headache and nausea, linked to psychotherapy, reflexology, vitamin D and vitamin E. These findings were observational; therefor, the study design does not allow for definitive causal inference. Future longitudinal research is required. A systematic review[59] of observational studies reported that 58% of the included studies did not report adverse effects from CAM modalities. This lack of safety data is concerning because parents and HCPs need evidence on whether an intervention imposes additional physical or psychosocial burden on the child. Moreover, data on CAM use in paediatric brain tumour populations are limited. In adults, Armstrong et al reported CAM use by 34% of brain tumour patients.[60] In the present study, 55.6% of children with brain tumours reported CAM use, making brain tumours the cancer type most commonly associated with CAM use. This finding is based on a small subgroup (n = 18) and should be interpreted cautiously. It may reflect greater morbidity and treatment intensity (e.g., surgery, radiation, chemotherapy, prolonged steroid use) and/or higher symptom burden in this group, which could confound the association.[61] The intensity and complexity of these treatments may drive the search for additional supportive care options, like CAM, to alleviate the physical and psychological burden experienced by these young patients. From the literature, we know that cancer patients use CAM to strengthen the immune system, alleviate adverse effects from cancer treatment, give hope, and reduce stress.[28,62] Parents of children with cancer provide CAM for their children to contribute to the child's recovery (do everything possible for their child) and to offer a sense of hope.[23,24] Results from unpublished data from Norway[34] show that parents express interest in discussions about CAM and other supportive care approaches. These discussions focus on strategies to support their own well-being, as well as that of their children and families, by reducing anxiety, preparing healthy meals, and maintaining a normal daily routine.

The inclination of parents to seek CAM modalities for their children may be influenced by the presence of distressing symptoms and the constraints of available pharmacological interventions. Children with symptoms such as fatigue, nausea/vomiting, immunosuppression, anxiety, and concentration difficulties were more likely to use CAM than those without these symptoms. However, because the study is cross-sectional and subject to potential selection bias and confounding, we cannot determine temporality or causality (i.e., whether symptoms prompted CAM use or vice versa). The similar pattern observed in a recent Norwegian study of adult cancer patients[63] provides external consistency and thus strengthens confidence in the robustness of this association across populations, although it does not address causality.

Particularly, fatigue stands out as a symptom that significantly impairs quality of life both during and post-cancer treatment. Given that pharmacological remedies are not routinely recommended for managing fatigue,[64] parents and caregivers may be more motivated to explore non-pharmacological options that can offer symptom relief and enhance the overall well-being of their children.

Chemotherapy-induced nausea and vomiting (CINV) is a prevalent adverse effect that is typically managed with antiemetic medications. Despite the use of these drugs, control of CINV remains suboptimal and is often only partially

achieved.[64] Previous research has consistently identified immune system enhancement as one of the primary motivations for the use of CAM in paediatric oncology patients.[36,39] The risk of late infections and the potential need for reimmunization among children with cancer are insufficiently described.[65] Additionally, children undergoing cancer treatment commonly experience profound anxiety,[66] with worry being cited as an especially troubling symptom.[13] Despite the frequency and intensity of anxiety, it may be under-assessed and under-managed by healthcare providers.[66] Compounding these challenges, many paediatric cancer patients also struggle with concentration, a symptom for which therapeutic options are notably scarce.[67] In light of these unmet needs, CAM modalities such as music therapy[68,69] and acupuncture[70] may offer valuable treatment avenues for these prevalent concerns.

4.1. Strengths and limitations

When interpreting the findings of this study, it is essential to consider both its strengths and limitations.

A key strength of the present study is its exploration of CAM use among paediatric patients in Norway, a country with high socioeconomic status and an advanced healthcare system, where a marked divide exists between conventional medicine and CAM. Consequently, parents primarily seek complementary therapies outside the paediatric oncology wards where their children receive treatment. In contrast to the presently acknowledged integrative oncology paradigm, where evidence-based complementary medicine modalities are being provided ***within*** the oncology centre, the present study explores CAM use among children in a clinical setting where these modalities are utilised mostly ***outside*** the conventional treatment setting. The gap between the concepts of CAM and integrative oncology is far from semantic but reflects a scientific rigor, legitimacy, openness, and level of communication between healthcare professionals, patients, and their informal caregivers. The present findings may be relevant not only to Norway but also to other European countries, particularly those in Scandinavia, France, and Eastern Europe, where integrative oncology has not yet been widely adopted despite a growing body of evidence-based research. One possible barrier to integration is the classification of music therapy, art therapy, and certain forms of psychotherapy as CAM. In other countries, these modalities may instead be considered components of psycho-oncology or supportive care rather than CAM. The present study therefore contributes a perspective that has received limited attention in the integrative paediatric oncology literature. It describes a setting in which the integration of supportive modalities may be constrained despite potential facilitators, including parental openness and the availability of national resources. These findings may inform a gradual, evidence-informed process of recognising and integrating appropriate supportive modalities while maintaining scientific rigour.

One of the primary limitations is the relatively small sample size and low response rate, which undermine the generalisability of the findings. Despite efforts to reach respondents through various channels, the number of survey participants remained limited. This challenge is consistent with findings from other research on CAM use in paediatric cancer patients,[16,22] which reports a moderate median sample size of 75 participants across 28 studies.[16] This limitation could be attributed to several factors, including the significant burden parents face in caring for a child with cancer while managing other responsibilities, as well as the anxiety and stress induced by the research process,[71] particularly for parents who have lost their child to cancer.[22]

Another limitation is the possibility that the survey link may have been distributed to parents of children with cancer who are not members of the Children's Cancer Society. This could have further reduced the response rate among the intended target group, introducing some uncertainty about whether the data fully represent members of the Children's Cancer Society. However, it is certain that all respondents are, or have been, parents of children with childhood cancer, ensuring that the study remains relevant to this population. Nevertheless, the findings of this study are based on a smaller and specific group of childhood cancer survivors in Norway, and as such, the percentages presented should be interpreted with caution. Future studies with larger and more diverse samples are needed to validate or challenge these findings. The study may also be subject to selection bias. Participation was voluntary and may have preferentially attracted parents who are more engaged in their child's care or who have particularly strong experiences or opinions about supportive therapies, which could inflate estimates of CAM use and reported benefits. Notably, the questionnaire did not label "CAM" as a separate category in the instrument or participant information sheet; it was not CAM-specific but surveyed a broad range of supportive-care approaches, including non-CAM modalities (the non-CAM items are not reported here). This neutral framing likely reduced but did not eliminate CAM-specific selection and reporting bias. Consequently, the results should be interpreted with appropriate caution. However, non-response bias remains a concern, as parents who chose not to participate may differ significantly from those who did, potentially being less interested in CAM or facing greater time constraints. These factors could limit the generalizability of the findings to the broader population of parents of children with cancer. Although our recall window potentially extended up to 30 years, this risk is mitigated because most respondents reported much shorter intervals: of 117 parents, 67.5% reported contemporaneous or near-contemporaneous experience (0–5 years), while only 12.8% reported more than 10 years since end of therapy. Being diagnosed within the last 30 years is further not equivalent to being out of

treatment for 30 years, many children experience prolonged or late effects and may receive ongoing care long after diagnosis. Our measures reflect CAM use across the cancer trajectory (during treatment, in the immediate aftermath, and in survivorship) which complicates simple interpretations of recall interval. Nevertheless, recall bias may have affected our findings: over long intervals parents can misremember or misreport their child's CAM use and its effects. A cancer diagnosis is profoundly traumatic, and parents often vividly recall treatments and symptoms[72]; however, vivid memories can still be inaccurate, and peripheral details may be forgotten, so the perceived role or effectiveness of CAM could be either over- or underestimated.[73]

Similarly, response bias could have influenced the findings, as participants may have provided socially desirable answers or exaggerated the benefits of CAM to align with perceived expectations or personal beliefs.[74] However, efforts were made to minimize this bias by ensuring full anonymity of the respondents. Measurement bias is another potential limitation, as the reliance on subjective self-reports may not have fully captured the extent of CAM use or its outcomes. However, it is worth noting that the agreement between self-reported data and registered healthcare utilization is generally high,[75] which lends some credibility to the findings.

A significant study limitation, which may impede generalization to other countries, is the CAM categorization adopted in the present study, especially the inclusion of psychotherapy and expressive arts like music and art therapy. These modalities may be regarded in other paediatric oncology settings as non-CAM, particularly when provided by the psycho-oncology unit embedded in the paediatric department or by the supportive/palliative care service. Nevertheless, these therapies often include mind-body therapies, such as relaxation and guided imagery, regarded within the complementary and integrative medicine scope of practice. Moreover, some of these expressive therapies are also regarded as part of leading integrative medicine, such as Anthroposophical medicine, with specialized branches of music, art, and movement (Eurythmy) modalities relevant in supportive cancer care.[76] In the case of psychotherapy, it remains unclear whether the psychotherapy reported by respondents was delivered by a licensed psychologist (typically not classified as CAM) or by a psychotherapist operating outside of conventional healthcare. This ambiguity may have influenced the reported prevalence of CAM use. For example, nine individuals reported using psychotherapy without engaging in any other forms of CAM. To address this issue, the prevalence of CAM use excluding psychotherapy is presented in Table 3.

Emotional bias may also have influenced responses, particularly among parents who experienced significant emotional distress, such as those who lost a child to cancer, potentially affecting how CAM use and its perceived benefits were reported.[77]

Another limitation is that parents were asked to relate and interpret their child's association with CAM use, while not exploring the child's direct perspective, at least with adolescents, and without referring to their own quality of life -related concerns and CAM experience. In contrast, present integrative oncology interventions in paediatric oncology, tend to focus not only on the sick child but on the parents' self-perspective, experience, and quality of life -related concerns as reported by Gressel et al in Israel.[78]

Despite these limitations, the study has several notable strengths. The findings regarding CAM use are consistent with those reported in earlier studies conducted in other high-income European countries,[19-22,36,38,39] lending credibility to the results and ensuring criterion validity. Furthermore, although the sample size is small, it is comparable to the population of children diagnosed with cancer in Norway. For example, the distribution of cancer diagnoses in the sample, where leukaemia and central nervous system tumours are the most common, mirrors the national statistics.[11] Similarly, the majority of children in the sample were diagnosed at age five or younger, which aligns with the broader Norwegian childhood cancer population, where cancer is more frequently diagnosed in children aged 0–6 years.[79] Additionally, the symptoms most commonly reported in this study (weakened immune system, poor appetite, nausea/vomiting, pain, and fatigue) are consistent with those documented in the literature.[13,64,80] Finally, this study represents the first nationwide investigation into CAM use among children with cancer in Norway.[23,24]

This study provides valuable insights into the use of CAM among paediatric cancer patients and their families. By acknowledging potential biases, the findings highlight the complexity of researching CAM use in this population and underscore the importance of interpreting the results in light of these limitations.

Using a symptom-focused lens of fatigue, anxiety, and worry, CINV, and cognitive concerns, we recommend integrating supportive CAM modalities such as music therapy, art therapy, psychotherapy, and massage within paediatric cancer centres. This implementation must, however, be guided by a formal risk-benefit evaluation for each modality.[81] We also encourage routine, non-judgmental conversations about CAM and other supportive modalities in paediatric oncology settings. Keep in mind that clinicians do not need to be CAM experts to initiate these conversations.[32]

Future research should aim to address these biases through more diverse sampling and strategies to minimize recall and response biases, thereby providing a more comprehensive understanding of CAM use in paediatric cancer care. Future work could be prospective and longitudinal, linking CAM use to patient-reported outcomes (PROs) and healthcare use, including adolescent self-reports. Moreover, the present study, with its focus on the parents, may be regarded in the broad context of the

informal caregiver literature, while attending to the significant other's or carer not only as a source of information but as a client that should be further explored in terms of their health-related concerns. While parents are often perceived as the most devoted informal caregivers, the present study may also suggest attending to their own needs and expectations within the parent-child dyad. In this regard, the present study may be meaningful not only as narrow-angle CAM research in a specific paediatric oncology environment in Norway but as a call for in-depth integrative oncology research in the adult setting while highlighting the role of the informal caregivers.

5. Conclusion

In this national parent sample, many families reported using CAM and supportive care modalities during and after treatment, mainly for symptom relief. Reported benefits were common, and adverse events were uncommon. Given the symptom burden and limited pharmacological options, it's reasonable to explore evidence-informed supportive interventions and ensure open clinician-family communication about use, safety, and expectations.

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ORCID iDs

Agnete E. Kristoffersen https://orcid.org/0000-0003-4642-0310
Eran Ben-Arye https://orcid.org/0000-0002-4058-3672
Dana C. Mora https://orcid.org/0000-0003-1209-3526

Ethical Considerations

The research was conducted in accordance with the Declaration of Helsinki. The study was sought approved by the Regional Committee for Medical Research Ethics Northern Norway (REK 178081) that stated that "*the project does not appear to be a medical and health research project that should be assessed by the REK (Regional Committees for Medical and Health Research Ethics) according to the Health Research Act*." As a result, approval from the Regional Committees for Medical and Health Research Ethics was not required. Instead, approval was sought and granted by the Norwegian Centre for Research Data (NSD) in November 2020 under reference NSD 493228.

Consent to Participate

Informed consent was obtained from all participants. Before completing the questionnaire, the parents received an information letter detailing the study's objectives, along with the purpose and content of the survey. Participants were required to select "I agree to participate" before proceeding with the survey. They were also explicitly informed of their right to withdraw from the study at any time without facing any adverse consequences. To ensure anonymity, the survey did not collect any personally identifiable information, such as names, birth dates, or residential addresses.

Author Contributions

D.M., A.E.K., T.S., and M.J. conceived the study, and contributed to the development of the questionnaire. D.M and A.E.K. conducted the initial and final analyses and drafted the initial version of the paper. All authors gave input in how to interpret and structure the findings and reviewed subsequent versions. All authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

The dataset on which this paper is based has not been deposited in any repository. However, all datasets and materials used in this study are accessible from the corresponding author upon reasonable request. Interested parties requesting access to the data must be prepared to adhere to comply with Norwegian privacy regulations and data-protection standards.

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Appendix

List of abbreviations

CAM	Complementary and alternative medicine
CINV	Chemotherapy-induced nausea and vomiting
CI	Confidence interval
HCP	Healthcare professionals (or healthcare personnel)
HIC	High-income countries
I-CAM-Q	International Questionnaire to Measure Use of Complementary and Alternative Medicine
IQR	Interquartile range
LIC	Low-income countries
LMIC	Lower-middle income countries
NAFKAM	National Research Centre on Complementary and Alternative Medicine (Norway)
NOK	Norwegian kroner
PRO(s)	Patient-reported outcome(s)
SD	Standard deviation
USD	United States dollar.