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Benefits and Burdens of Vaporized Botanical Cannabis Flower Bud for Cancer-Related Anorexia: A Qualitative Study of the Experiences of People with Advanced Cancer Enrolled as Inpatients in a Phase I/IIb Clinical Trial and Their Family Carers

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Abstract

Background: Clinical trials are underway of medicinal cannabis for cancer-related anorexia, using various formulations and modes of administration.
Objectives: To explore the benefits and burdens of vaporized medicinal cannabis flower bud for anorexia from the perspectives of trial participants with advanced cancer and their carers.
Design: People with advanced cancer enrolled as inpatients in a Phase I/IIb clinical trial, and their carers participated in face-to-face semi-structured interviews. Analysis used the framework method.
Setting: Inpatient specialist palliative care.
Results: Ten out of 12 trial participants and 6 carers were interviewed. All perceived benefits to eating but, in two cases, this arose from reduced nausea rather than appetite stimulation. Carers sometimes perceive more benefit than patients. Psychoactive effects were well-tolerated and even enjoyed. Burdens included throat irritation and adverse smell and taste, but these were transient.
Conclusions: Vaporized flower bud warrants comparison with other formulations/modes of medicinal cannabis for cancer-related anorexia.

Keywords: anorexia; cancer; cannabis; caregivers; clinical trial; qualitative research

Introduction

Anorexia occurs in up to 80% of people with advanced cancer, contributing to weight and muscle loss and reducing survival.[1] Medicinal cannabis – the term used to describe a cannabis product that is prescribed by a registered health care practitioner to relieve symptoms[2] – has emerged as a potential treatment, but evidence is mixed on its efficacy.[3–7] Clinical trials have generally used isolated cannabinoids administered in tablets or capsules.[6] However, whole cannabis flower bud may have the advantage of enabling an "*entourage effect*": that is, "*the idea that compounds found in cannabis—such as cannabinoids, terpenes, and flavonoids—can work synergistically, enhancing the therapeutic effect outcome compared to the effects when they are used individually*"[8] (p. 1).

In the community, people with cancer often smoke flower bud cannabis, but bioavailability depends on inhalation depth and duration.[9] Smoking cannabis can also cause respiratory problems, unpleasant taste/smells, and mouth dryness.[3,10] Qualitative studies on cannabis for other medical conditions suggest that, compared with smoking, patients perceive vaporizing to have advantages in taste, cough, portability, discretion,

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and cost-efficiency.[11,12] Biomedical research suggests that using a vaporizer also reduces harmful pyrolytic by-products and allows for more precise dosing, enabling better control over cannabis consumption and more accurate bioavailability studies.[13]

The current study aimed to explore benefits and burdens of vaporized medicinal cannabis flower bud for anorexia from the perspectives of trial participants with advanced cancer and their carers.

Methods

Study design

This was a substudy of a single-arm, single-blind, single-site, investigator-led Phase I/IIb clinical trial designed to investigate the pharmacokinetic dose–response parameters, safety, and feasibility of vaporized botanical cannabis flower bud in advanced cancer (Australian New Zealand Clinical Trials Registry: 12616000516482).[14] The supplementary material describes the investigative agent, Bedrobinol (Bedrocan®, the Netherlands) and vaporizer in more detail (see also Razmovski-Naumovski et al., 2025).[15] Bedrobinol uses a botanical cannabis "Sativa" strain (delta-9-tetrahydrocannabinol 15.4% and cannabidiol 0.05%). Participants were admitted as inpatients to a quaternary referral hospital in metropolitan Sydney, Australia.

The substudy used a qualitative approach with a pragmatic orientation to enable in-depth exploration of patient and carer perspectives. Participants were recruited between February 2017 and August 2019.

Ethics

This study received ethics approval through the Hunter New England Human Research Ethics Committee (HREC/15/HNE/381). All participants provided written informed consent.

Participant selection

The trial included adults with advanced cancer who reported appetite loss ≤4 on a 0–10 numeric rating scale for ≥2 weeks with no response to treatment. All trial participants and visiting family carers were invited to be interviewed.

Data collection

Interviews were conducted on Day 8 by a female trials nurse. Patients and carers were interviewed separately to maintain different perspectives (see Box 1 for the interview guide, developed by the investigators). Interviews were audio-recorded and transcribed.

Performance status was clinician-rated at baseline using the Australia-modified Karnofsky Performance Status.[16] Patients rated Global Impression of Change in Appetite (GIC-A) at Day 8 using a 7-point single-item Likert scale (1 = "very much better" to 7 = "very much worse").[17]

Data analysis

Analysis used the framework method[18] with a deductive approach focused on benefits and burdens of cannabis and vaporizing. Transcripts were coded using NVivo V11 software by a female medical student (M.G.), with review/discussion by two others to agree interpretation of any ambiguities (T.L., V.R.-N.).

Box 1. Patient and Carer Interview Guides

Patient interview guide

1. Can you tell us about the experience you have had with loss of appetite?
2. Has loss of appetite had any impact on you, physically and emotionally?
3. Has the loss of appetite you have experienced impacted your family, and if so, in what way?
4. We would like to understand how you found the study intervention to help us fine-tune the methods for future studies.
   a. Can you tell us your opinion about the ease of use of the vaporizer? Did it pose any difficulties?
   b. Can you tell us about the effects from the cannabis flower bud that you have experienced, both positive and negative?
   c. Are there particular issues that you feel are important for us to change for any future studies?

Carer interview guide

1. Can you tell us your view of the experience of loss of appetite of (insert name of participant)?
2. How has (insert name of participant)'s loss of appetite impacted you and other family/friends?
3. We would like to understand your perception of aspects of the study to help us fine-tune methods for future studies.
   a. Can you tell us your view of any particular aspects of the study, which you feel are important for us to change in future studies?
   b. In your opinion, what have been the overall effects of the cannabis flower bud on (insert name of participant), both positive and negative, during the time of the study?

Results

Of the 12 trial participants, 10 were interviewed (Table 1). One refused, while the other withdrew before the interview. All patients who were interviewed had completed all doses in the trial.

Perceived benefits

All participants perceived that cannabis had some effect on eating, although the degree of benefit varied:

> *"*Oh my god, it did improve. Right from the beginning it was a bit better.*" P01, 64-year-old woman with breast cancer, GIC-A "very much better"*

> *"*Well, I thought it was good. It made me want to eat.*" P02, 61-year-old man with prostate cancer, GIC-A "much better"*

> *"*It has just been a slight change in the taste and appetite.*" P08, 62-year-old woman with pancreatic cancer, GIC-A "same"*

Table 1. Baseline Characteristics and Outcomes of 10 Inpatients with Advanced Cancer and 6 Carers Who Participated in Interviews

ID	*Age*	*Sex*	*Participating carer*	*Primary diagnosis*	*AKPS*	*GIC-A*
P01	64	Female		Breast	80	1
P02	61	Male		Prostate	80	2
P03	60	Male	Brother (C03)	Pancreatic	70	4
P04	73	Female	Husband (C04)	GIT	80	4
P05	82	Male		Lung	80	4
P06	63	Male	Wife (C06)	Pancreatic	70	2
P07	51	Female	Husband (C07)	Pancreatic	70	3
P08	62	Female		Pancreatic	70	4
P09	73	Female	Husband (C09)	Head and neck	80	3
P10	70	Female	Husband (C10)	Colorectal/secondary lung	80	3

AKPS, Australia-modified Karnofsky Performance Status; GIT, gastrointestinal tract; GIC-A, Global Impression of Change in Appetite.

Two patients perceived that cannabis encouraged eating by reducing nausea rather than stimulating appetite. These two rated the GIC-A as "same" and "a little better":

> *"Eat the food and keep it down . . . No nausea. But before, going back a month or two, I had really bad nausea—it was awful." P04, 73-year-old woman with GIT cancer, GIC-A "same"*

> *"I don't have an appetite . . . I don't want to eat [but] force myself to eat. I would be sick . . . but . . . I've gotten over the hurdle." P09, 73-year-old woman with head and neck cancer, GIC-A "a little better"*

Carers sometimes perceived more benefit than patients:

> *"In my perception, she is actually got better appetite now, she looks better, and she looks happier within herself." C10, husband to 70-year-old woman with metastatic colorectal cancer, GIC-A "a little better"*

Carers derived emotional benefit from witnessing improvements:

> *"[The effects have been] positive—seeing him want to eat." C06, wife to 63-year-old man with pancreatic cancer, GIC-A "much better"*

Cannabis-related adverse effects

Only one patient reported no adverse effects. Psychoactive effects were reported by 6/10 and included "*intoxication*," sedation, and dizziness/light-headedness. Patients described intoxication in terms of feeling "*relaxed*" or "*mellow*" rather than adverse. One patient reported feeling so sedated that they were unable to stay awake. Sensory changes were described by one patient as follows:

> *"I felt almost more supersensitive—almost a ringing in my ears. And my vision was, a bit—I think it [the cannabis] sort of limits it [vision], it focuses it more, rather than being as broad." P10, 70-year-old woman with metastatic colorectal cancer, GIC-A "a little better"*

Another patient reported "*odd*" and "*unpleasant*" effects as follows, which were more pronounced early on:

> *"I'm not sure whether I had very slight black out for a very short time or I just didn't get the memories in the right order, you know? But it went, it went . . . The strobing didn't help either." P01, 64-year-old woman with breast cancer, GIC-A "very much better"*

One carer was concerned that cannabis would prohibit driving if used after the trial, given its illegal status.

Vaporizer-related adverse effects

Several patients reported vaporizer-related burdens, albeit mild and transient.

Two patients reported throat irritation leading to a cough, while another's voice was impacted. One alleviated discomfort through careful positioning:

> *"So I've been jiggling with that a little bit myself, trying to get it so that I don't get the tingly on the roof of the mouth etc. It all takes time." P04, 73-year-old woman with GIT cancer, GIC-A "same"*

Not all patients perceived the heat to be of concern:

> *"You could feel it getting hot but nothing that would bother you, it's not that hot." P02, 61-year-old man with prostate cancer, GIC-A "much better"*

One patient reported a smell on clothes, and three an intermittent but unpleasant taste:

> *"Oh, I just got that taste in my mouth sometimes, awful taste, not all the time, just every now and then." P09, 73-year-old woman with head and neck cancer, GIC-A "a little better"*

Vaporizer ease of use

All six patients who commented on ease of use reported no difficulties after a brief learning period:

> *"It is hard to inhale it and hold your breath there for X amount of time. But again, I'm not used to doing it, too. But yeah, I did find it easy enough to use." P07, 51-year-old woman with pancreatic cancer, GIC-A "a little better"*

One participant suggested improvements to the vaporizer's design:

> *"If it was something that fit more ergonomically, I suppose, to your lips, you wouldn't have to have that effort in using it." P01, 64-year-old woman with breast cancer, GIC-A "very much better"*

Discussion

This qualitative study found that vaporized cannabis bud had a positive benefit–burden ratio according to patients with advanced cancer enrolled in a Phase I/IIb clinical trial and their family carers. Patients also found the vaporizer easy to self-administer after a brief period of trial and error.

Interestingly, our findings suggest that some people with advanced cancer may believe that cannabis helps them to eat by reducing nausea rather than stimulating appetite, providing context for clinical trials using patient-reported outcome measures such as the GIC-A and Functional Assessment of Anorexia/Cachexia Treatment (FAACT).[19] Cognitive interviewing[20] may be needed to explore how the various effects from vaporizing cannabis might influence GIC-A responses and participant interpretation of FAACT items such as "*most food tastes unpleasant to me*" and "*I have difficulty eating rich or 'heavy' foods*." Notably, the FAACT only assesses nausea by means of a single item in its "physical well-being" subscale rather than its anorexia–cachexia subscale, so this symptom will be missed if the latter is administered as a stand-alone measure.

Surprisingly, only a minority of participants in our study reported psychoactive effects from cannabis. In accordance with previous medicinal cannabis studies for other symptoms, these were perceived positively by some patients.[7,20] However, feelings of intoxication that some individuals find enjoyable as an inpatient may raise more concerns in the community, where these feelings could limit day-to-day activities, highlighting the need for testing in that setting. In particular, the impact of cannabis on driving, mentioned by one participant in our study, has been found by other research to dissuade people from taking part in trials.[21]

Limitations

Our study is limited by its small sample of patients with relatively good performance status. Moreover, people may enroll in cannabis trials because they believe it will be effective for symptom control,[21] exposing perception of benefit to confirmation bias. Interviews were cross-sectional rather than longitudinal to minimize burden to participants. Given recall bias, this precluded detailed exploration of how perceptions of benefits and adverse effects may have changed over time in accordance with variation in dose. Participants may also have been mistaken in attributing benefits and adverse effects to cannabis versus other causes. Finally, the trial's inpatient setting and short follow-up period limited exploration of benefit–burden and adherence in the community and longer term.

Conclusion

Vaporized cannabis flower bud for cancer-related anorexia warrants comparison with other formulations and modes of administration, both quantitatively and qualitatively.

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Authors' Contributions

T.L., V.R.-N., J.P., R.C., B.N., B.F., J.M., and M.A. contributed to the design and methods for this research. T.L., M.G., and V.R.-N. conducted the analysis and drafted the article. All authors contributed to the critical revision of the article and approved the final version.

Data Availability

The data cannot be shared due to the potential for reidentification based on whole transcripts.

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Author Disclosure Statement

The authors declare that there are no conflicts of interest.

Supplementary Material

Supplementary Data

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