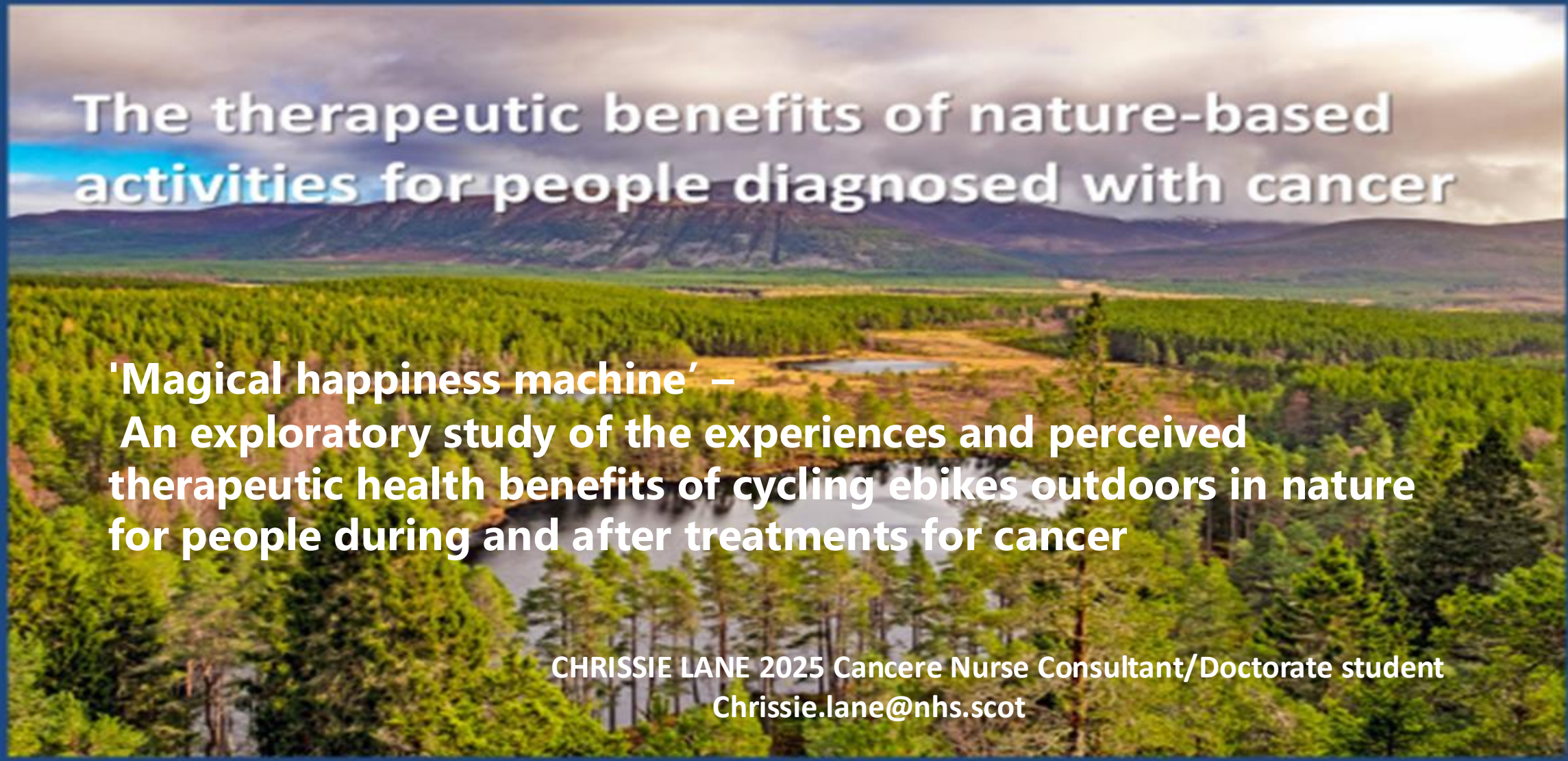

'Magical happiness machine' – An exploratory study of the experiences and perceived therapeutic health benefits of cycling ebikes outdoors in nature for people during and after treatments for cancer

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The main aim of this exploratory qualitative study is to support the recovery of people during and after treatment for cancer by understanding their experiences and the potential health benefits of using ebikes for recreational journeys in nature

- **Is it feasible to use a GoPro for the purposes of conducting video elicitation interviews?**
- **How feasible is it to recruit a representative sample of people with cancer and which recruitment methods yield the most participants?**
- **Are participants willing to travel from different parts of the Highlands at least once a week to such as Cairngorm National Park (CNP) and Fort William to ride ebikes?**
- **Is a route planning app (Komoot) a feasible and acceptable method for participants to measure distance travelled and type of route?**



CONTEMPORARY ISSUES WITHIN CANCER SUPPORTIVE CARE

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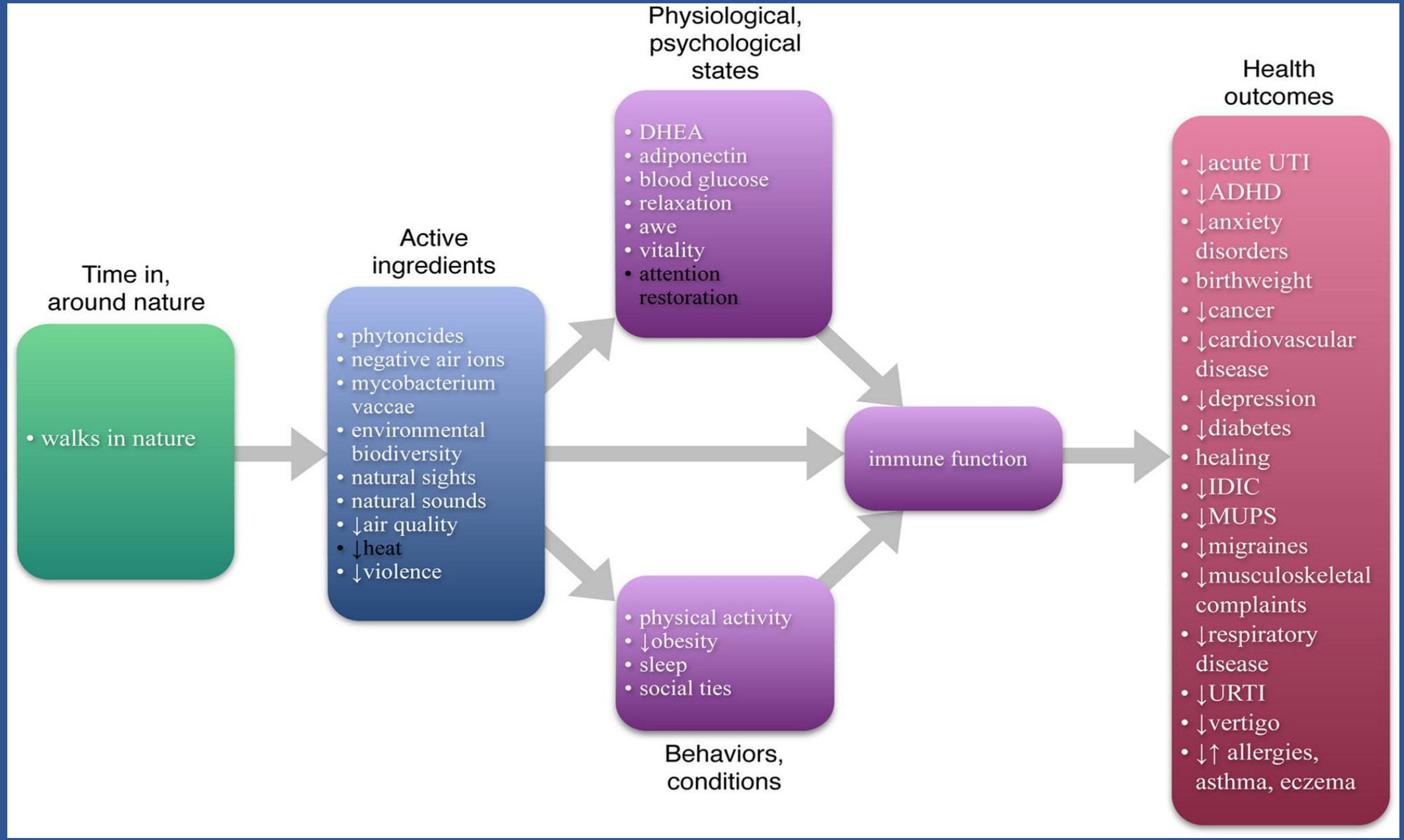
- Cancer treatments have become more successful – shifting paradigm as now have a burgeoning population of people living after cancer therapies, with associated long term side effects

- A shift in approach to care that moves beyond cure and survival by focusing upon recovery and health and wellbeing was identified as one of the top priorities within the National Cancer Survivorship Initiative (NCSI, 2010)

- Harness peoples' motivation to self-manage and choose beneficial lifestyle choices to improve their quality of life, particularly fatigue (James Lind Institute 2019) . Increasing the physical activity levels of people after a cancer diagnosis is associated with improvements in the domains of treatment related side effects, quality of life, functioning and survival (Friedenreich et al 2020)

Qualitative studies about nature in cancer patients' lives concluded that nature provides a 'nurturing context' and 'caring connections' with self and others which serve to support them to navigate the clinical and personal consequences of cancer (Blaschke 2017) and nature programmes may potentially help people with cancer address the problem of stress, which can sometimes be overwhelming during treatment and recovery (Duncan et al 2017; Olsson Möller et al 2019)

Frumkin (2013) advocates that,
"Nature interactions are widely available and inexpensive; they don't need to be prescribed or dispensed by highly trained professionals; they are easily personalized according to age, ability, and cultural preference; they inflict few adverse effects; and they offer numerous co-benefits—claims, by the way, that few medical treatments can make. This field deserves far more research attention than it has had".


Time in, around nature
• walks in nature
Active ingredients
• phytoncides
• negative air ions
• mycobacterium vaccae
• environmental biodiversity
• natural sights
• natural sounds
• ↓air quality
• ↓heat
• ↓violence
Physiological, psychological states
• DHEA
• adiponectin
• blood glucose
• relaxation
• awe
• vitality
• attention restoration
Behaviors, conditions
• physical activity
• ↓obesity
• sleep
• social ties
immune function
Health outcomes
• ↓acute UTI
• ↓ADHD
• ↓anxiety disorders
• birthweight
• ↓cancer
• ↓cardiovascular disease
• ↓depression
• ↓diabetes
• healing
• ↓IDIC
• ↓MUPS
• ↓migraines
• ↓musculoskeletal complaints
• ↓respiratory disease
• ↓URTI
• ↓vertigo
• ↓↑ allergies, asthma, eczema

Fox (Fox, 2014) ponders that the bicycle has the potential to connect the individual with the physicality of the body and the sensory palette of the surrounding natural and human-made world.

Ebikes - offer the opportunity to people who may not be regular cyclists or who have health issues that limit their physical fitness, to undertake moderate levels of physical activity to improve their health and wellbeing (Jones, Harms & Heinen 2016; Louis, J et al 2012). The potential impact of recreational usage of outdoor cycling for people recovering from cancer has not previously been studied

RESEARCH QUESTION

What are the subjective experiences and perceived health benefits of nature for people during and after treatment for cancer, whilst riding ebikes through a natural environment?

The research questions associated with assessing the feasibility and methods to explore these experiences and perceptions are:

1. **How feasible is an evelomobile interview in this population and would a GoPro capture the necessary dialogue and visual for the purposes of conducting video elicitation interviews?**

2. How feasible is it to recruit a representative sample of people with cancer and which recruitment methods yield the most participants?

3. Are participants willing to travel from different parts of the Highlands at least once a week to such as Cairngorm National Park (CNP) and Fort William to ride ebikes?

5. Is a route planning app (Komoot) a feasible and acceptable method for participants to measure distance travelled and type of route?

METHOD

- Recruited 12 people who had a cancer diagnosis (average age 51; 7 women; 5 male; 4 receiving cancer treatments did not complete study)
- Gave them access to an ebike for 10 weeks – rode where they wanted
- Recorded routes on komoot and analysed data
- Undertook 1-2 velo-mobile interviews
- Transcribed interviews – thematic analysis



RESULTS

- Difficulties of recruiting vulnerable participants post covid and through clinical teams
- Bike shops were brilliant!
- It was straight forward interviewing participants as we rode along so did not need to use a GoPro on video. Files were huge! Audio worked well
- Komoot was not a robust means for data collection. Average distance rode ranged from 4.7 m/37 mins to 11.6m/57 mins
- Fatigue, motivation, weather, other time commitments cited as reasons for not ebiking more – BUT all miles they would not have done if they did not have an ebike!

Table 1 Participant Komoot Recordings (average of the recorded data)

Participant	Distance (miles)	Cycling Time (mins)	Average speed (mph)
03	4.86	37	7.6
04	11	64	9.8
05	21.5	112	11.38
06	14.8	109	7.85
07	16.1	83	9.4
08	11.6	59	13.1
10	10.8	37.9	15.1

THEMES (some)

- **Seeking out nature to provide emotional regulation: (a behaviour that leads to an outcome – wellbeing)**

Being in nature and the embodiment of cycling both cultivate present-moment awareness which shifts attention away from worrying thoughts. Being among trees and sensing the surrounding air was perceived as a behaviour that was good for health:

"I liked nothing better than getting out into the trees and you always felt the air was just that bit different and maybe it was your imagination, maybe it was things you'd read about but you'd end up sucking in more of it and taking big lungful's of it thinking it was doing you good"
"Being outside is the bit that drives it, the activity is the bonus, almost."
"Nature quietens your thoughts. It is always changing. You never tire from it"
"I went out to be out"
"Being out in nature, watching & listening to the birds, looking at the scenery and feeling the fresh air makes me happy 100%"
" Even in the rain as well it just feels like you're- you're light when you come back from your burdens and your worries"
"I've always gone out, either driven somewhere, if I couldn't walk or cycle. Yes, gone somewhere that I can look out on something, yeah. Any big things that have happened, that's what we've done, like when we got the diagnosis, that's what we did – it was lunchtime. So we just drove up out (name of a village) way, and just parked somewhere as I need to be outdoors when life is difficult"

Subtheme: Nostalgia

This recalling of positive emotions engages reward-related neural pathways and releasing neurochemicals – serotonin and oxytocin. These create a natural stress release mechanism within a persons' body.

"There was a wee wren just appeared there a second ago, just things like that, of no importance whatsoever but just…then the thing I find with wrens is they always remind me of the west coast and they always remind me of mountain streams because you tend to get them in these little waterfall bits and you can hear them singing and that's a really lovely feeling because that's so many times that's happened, it brings back so many nice memories"

"I think it makes me feel happy…feel happy. Always thinking they were good times….and just feeling warm and a good feeling"

Subtheme: Attention Restoration – Kaplan & Kaplan theory that certain environments can help restore depleted attentional capacity. Restorative environments contain 4 characteristics- 'Being away'/ 'fascination'/ 'extent'/ 'compatibility'

"So when you get everything else out of the way, your other worries, that's when you really enjoy getting into nature and that's when you enjoy just appreciating it and slowing down and breathing and that is your reward, at that point, that sense of timelessness"

"It's really hard to say but sometimes I have this moment where I suddenly realise that I haven't been thinking about anything and I don't have a sense of how long it's gone on for but it's an amazing relief…when suddenly it's like…[exhales] and suddenly my brain feels like it's had this little rest"

"The last bit I was going to say is it really struck me how positive getting out on the bike has been in this last month and a half. I think with four and a half months of treatment so far has been quite a rollercoaster because beforehand there was potential that the drugs weren't going to do very much and then it was a huge known/unknown but relatively seriously outcome-driven, I guess. It's like, 'well there might be nothing left to do', and then that unknown of what does that really mean, time-wise and whatever. So that's been quite an emotional rollercoaster and definitely biking has been really good because you are in the moment, and you forget about it all"

Theme - Immersion into a scenescape

“Oh lovely, it’s just so…fresh air, colours on everything that we can enjoy. The purples, the greens, all the different shades of greens. The dark, even though on a dull day, how the mountains change from being colourful to a really deep, deep blue. Trees that have got nothing on them. Yes, and the smells…the different smells. Wood, lovely woody smell. And heathers. It’s lovely, they are just going over but they are still there. So lovely to just be out in the fresh air and…makes you feel good”

Sub theme - Haptic stimulation is powerful in connecting people to nature environments

“Being out in nature, watching & listening to the birds, looking at the scenery and feeling the fresh air makes me happy 100%”

“I think it’s the freshness. And you can feel the wind, I guess the air is moving, it’s not all shut up and inside”.

“You’re distracted but also you feel like the wind when you’re cycling is washing all the cobwebs away”

“I think just getting out and breathing the fresh air, be it through the wind and the rain”.

Visual connection

“They {views} are just a treat for the eyes. It’s that sense of being able to pause and just enjoy something, it’s almost like your reward, I think, the reward for your hard effort”

“ I remember the feeling of ‘oh gosh, look at these trees, look at the way the landscape changes from month to month, look at that bird.”

“Oh look at these {fungi}. So in the past I would have just have walked past these fungi”

Olfactory –
"…and you know, the smells of wild roses, it's just beautiful. And I used to cycle into [name of a town in the highlands] *and I loved going by this row of wild roses because the smell just made me feel really good, really good as roses always remind me of my mother.* It's like the other day, I was out on my bike and it had been raining and I thought the smell of the grass, it was just so nice – fresh*"*

Soothing sounds –
"Yes, even sitting by the sea and listening to the ripples. Oh yes listening to the wind, even listening to the wind. The stillness of everything and listening to the wind and watching everything blowing. It just felt really relaxing"

"You sit here listening and it's lovely so relaxing but it makes me think 'I could be in swimming, I could be paddle-boarding, I could be doing that…"

THEME - ENABLING BENEFITS OF EBIKES

"Magical happiness machine"

Subthemes - Improved self-efficacy

"… not quite destructive but almost becoming destructive emotional feel of…well, this is only ever going to be progressively not as good and then you get out on the bike and you forget it all because the bike takes any of that depreciation of your ability, fitness, takes it all away. Because it doesn't matter if you are a bit tired and you go a bit slower, because you get the boost from the motor, it's not like somebody is telling you, it just does it. Suddenly you are back out in the woods or doing whatever and it's just magic. And it is complete magic"

"I think one of my bike rides was in the pouring rain, icy, sleety rain and I was thinking I must be off my rocker but actually I really felt the benefits when I came home, I really felt invigorated, I really felt 'oh that was good', good for my body, for my mental health, for everything. Yes, so because of that experience it kind of spurred me on."

"I find this is definitely a lifesaving prescription as much as any medication is. And it just makes you feel so much better. It just makes you feel so much better, and I think the mental side of it is not addressed. So, going back to the bike during chemo, if I had that sense of achievement, I was on my bike twice this week in a chemo cycle, oh, what a difference it would make".

Safety of Home

"Oh absolutely, go for it {cycling an ebike}. No, they are just brilliant, brilliant. It's your freedom back and as I say, for me, I was quite relaxed on it because I know it'll get me home again, I don't have to worry"

"We went out on the Wednesday with a couple of friends and I took the second battery because I knew we were going to go up into the hills a bit. I didn't need the second battery. But it just meant I didn't need to worry about if I needed to use the motor more, I knew I was always going to have power. So the benefit of the ebike was ginormous, I wouldn't have gone out if I didn't have an ebike. And as it turned out, I didn't get as tired, as quickly, as I thought I was going to. There was loads of little happy moments as a result of being outside. And it was a lovely, sunny day and the colours were amazing, you get all the magic of being out at this time of year. And I could have gone for a walk with the dogs and got some of that, but I wouldn't have got all of it that I got from the bike."

Exploration and Micro-adventures

"So, but initially novelty, the sense of freedom, the sense of 'I can go places I wouldn't have gone on my normal bike', I don't have to worry about coming back…… So yeah, I think that – the novelty at the beginning and what sustained it was the discovery of new places to go" (Harris) *"….. I'd ordered the electric bike and - I can't remember, by that time I'd got the electric bike, and that was a very gentle way of getting out and going for quite long journeys and escaping, I think is the word I keep using – escaping, escaping the sense of being trapped at home because you physically weren't able to do things."*

"Aw, it makes me feel alive and adventurous {being outside on an ebike}. Then even when I feel tired, which is something which does sometimes make me feel grumpy, I don't resent feeling tired so much because it feels like I'm tried because I've been having a proper number of adventures on the bike. I don't know if there's something different about being in this post-cancer phase that has made me want to explore more things. So, in a way, now I feel like I want to explore more in a way that I was sort of – didn't really need so much before. But I'm not sure why"

"To me, the benefit is getting to places where I wouldn't be able to get to without the e-bike. I wouldn't have been able to walk to these places and been able to go places- like we went the last time, the lighthouse, where I know it's quiet. But, no it's- like you say, getting up to the lighthouse, getting up to- even one day, up to Loch {name of a loch}, and I don't know. It's just something that I couldn't think about without having the ebike

"I'd been trying to harbour my energy so that I could also do other things but it had been making me really sad, really sad and quite grumpy and just short-tempered and not feeling myself and yeah, I just…I've just got a really short fuse all the time and when I was wasn't working I was basically sitting at home feeling a bit sorry for myself. And so, had this revelation that I needed to prioritise being out on the bike, having adventures and seeing the amazing autumn colours and it didn't matter if I was maybe too tired to do other things, I would just work that out when it happened"

Conclusions –

The embodied social practice of ebiking has the potential to offer health promoting practices (physiological) & nature can provide the therapeutic encounters for psychological wellbeing for people diagnosed with cancer to improve outcomes during and after cancer therapies.

More research is required!

EVELO-MOBILE INTERVIEWS - REFLECTIONS

- Fun for both parties – lots of laughter (& tears!)
- Terrain afforded opportunities for side-by-side interviews (usually!)
- Intimacy of the shared experiences and immediacy of stimulation by environment
- GoPro was comfortable for participants – beware file size!
- Trust & safety – confident in the ebike
- Potential as a therapeutic intervention - participants reported that it was better than any therapy
- Caution – can cause interviewer to day dream!
- Ebikes offer valuable assistance (& confidence) for people with cancer during & after cancer therapies to easily increase activity levels

