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## Article

# Perceived Barriers, Facilitators, And Needs Related to Promoting Physical Activity in Cancer Care: Qualitative Insights from Oncology Care Providers

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**Simple Summary:** Regular physical activity can help people with cancer recover and feel better, but oncology care providers often struggle to include physical activity advice in routine care. We interviewed 16 cancer doctors, nurses, and support staff to learn how they view physical activity counseling, the obstacles they face, and what would help them support patients in staying active. Providers reported valuing physical activity but noted barriers such as unclear exercise guidelines, limited training, time pressures, and patients' health or safety concerns. They expressed a need for targeted education, straightforward recommendations, and stronger teamwork. Addressing these gaps could make physical activity an integral part of cancer care, improving survivors' recovery, quality of life, and long-term health.

**Abstract: Background:** Physical activity (PA) is associated with lower mortality and cancer recurrence risks. Although evidence shows health benefits for cancer patients before, during, and immediately after treatment, PA recommendations are not regularly included in the standard care. **Objective:** The study aimed to identify perceived knowledge, barriers, and facilitators of oncology providers' PA promotion for cancer patients using the 5A (Assess, Advise, Agree, Assist, and Arrange) framework. **Methods:** A qualitative research design with phenomenological approach was adopted. A purposive sample of 16 oncology care providers in Nebraska participated in semi-structured interviews via Zoom/phone. Interviews were audio-recorded, transcribed, and imported into MAXQDA 2024 for thematic analysis. **Results:** Analysis of the qualitative data identified five themes: (i) Perception of PA among oncology care providers suggested that they were able to define PA; (ii) PA counseling practices included advising on PA and assessment; (iii) Barriers to PA counseling included lack of guideline awareness, insufficient training, low prioritization, uncertainty about responsibility, time constraints, limited resources, lack of referral systems, patient health conditions, and environmental factors; (iv) Facilitators were identified as acknowledged health benefits for cancer survivors, awareness of PA recommendations, access to community resources, and support from interdisciplinary teams; and (v) Expressed desire among oncology care providers for training on incorporating PA into oncology care. **Conclusions:** Oncology providers recognized PA's health benefits for cancer survivors but did not promote it due to inadequate knowledge of

guidelines and lack of resources. These barriers require improved PA counselling education to help providers incorporate PA into clinical care.

**Keywords:** oncology care providers; barriers; facilitators; physical activity; qualitative study

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## 1. Introduction

Advancements in early detection and treatment have markedly enhanced cancer survival rates, with 69% of patients surviving beyond five years post-diagnosis [1]. Despite this positive trend, cancer treatments such as surgery, hormone therapy, radiation therapy, and chemotherapy can induce immediate, late, and long-term side effects such as cancer-related fatigue, musculoskeletal pain, metabolic dysfunction, cardiovascular impairment, cognitive concerns, diminished mental health, and the onset of other chronic illnesses [2–9] that can negatively impact the health and well-being of cancer patients [10–12].

Research has consistently indicated that regular physical activity (PA) can alleviate many adverse side effects associated with cancer treatments [13,14]. Specifically, PA has been demonstrated to significantly enhance muscular strength, aerobic endurance, physical function, and various aspects of quality of life (QOL), including improved sexual health and reduced fatigue [15–21]. Furthermore, there was evidence that PA may decrease the likelihood of developing other chronic diseases (e.g., cardiovascular disease or hypertension) and confer survival benefits across diverse groups of cancer patients [22–24]. The American Cancer Society and the American College of Sports Medicine have issued PA guidelines for cancer survivors that advocates for 150-300 minutes per week of moderate-intensity or 75-150 minutes per week of vigorous-intensity PA, along with muscle-strengthening activities on two or more days per week tailored to the specific needs of each cancer survivor [25,26].

Despite the established health benefits of PA and the issuance of PA guidelines, a notable disparity persists in PA participation among cancer patients when compared to healthy individuals of similar ages, with many cancer patients failing to engage in sufficient PA to recoup related health benefits [27,28]. Research indicates that most cancer survivors are inadequately active, with adherence to PA guidelines ranging from 17% to 47% [29–31]. It thus becomes imperative to identify effective strategies to inform and motivate cancer patients to engage in PA.

Although cancer patients express a desire for PA guidance, they frequently do not receive advice or counseling from their oncology care providers (e.g., oncologists and oncology nurses), who are their preferred sources of information [32–34]. Less than 40% of cancer patients reported receiving PA recommendations from oncologists during and after treatment [35–37]. Consequently, it has been recommended that a multidisciplinary team of oncology care providers, including oncologists, oncology nurses, oncology nurse practitioners, patient navigators, and oncology social workers, should collectively assume the responsibility of discussing PA recommendations with cancer survivors to enhance their PA levels [38,39].

Barriers and facilitators influencing oncology care providers' routine provision of PA recommendations to cancer patients remain under investigation. This study aimed to explore the perceptions of PA counseling and related clinical practices of oncology care providers to identify barriers, facilitators, and preferences related to PA counseling within the context of oncology care. A comprehensive understanding of oncology care providers' strategies for promoting PA and the challenges associated with such promotion can inform future interventions and potentially influence their training in the cancer care continuum.

## 2. Methods

### 2.1. Study Design

A qualitative phenomenological approach was employed to explore the roles, opinions, experiences, and recommendations of oncology care providers with regards to the provision of PA

counseling for cancer survivors [40]. This approach focuses on examining phenomena by illuminating experiences and understanding the meaning attributed to participants [41]. It is grounded in the philosophy of social constructivism, emphasizing the interpretation of events and life through a sociocultural and historical perspective. This involves an iterative process to gain insight into participants' viewpoints, thereby constructing a more comprehensive understanding of their lived experiences [42].

## *2.2. Sampling and Recruitment*

Eligibility for participation was restricted to individuals providing direct care and treatment to patients with cancer. A purposive sampling method was employed to recruit 16 oncology care providers (4 male and 12 female) from diverse demographic groups within a large hospital in the Midwest region. Oncology care providers include physicians (surgical oncologists, medical oncologists, and radiation oncologists), nurses (advanced practice nurses and registered nurses), and allied health professionals (physician assistants, dietitians, and oncology social workers). The recruitment target was to enlist 16 oncology care providers. Previous research indicates that 8 to 16 in-depth interviews can achieve 80-90% data saturation [43].

A total of 16 participants were recruited through purposive and snowball sampling [43]. Recruitment was conducted by disseminating digital flyers to community partners (oncology clinics and hospitals) through social media, email, and referrals from other potential participants. The flyer provided a brief introduction to the study, the eligibility criteria, and the contact information. Eligible participants were contacted by the lead author (GK) using their preferred method of communication (i.e., text, email, or phone call) to schedule an interview at a time and date convenient for them.

## *2.3. Data Collection*

Data were collected from August 2023 to February 2024 through using a semi-structured interviews via Zoom and/or telephone, based on participants' preferences. The interview guide was developed to elicit oncology care providers' perceptions and practices regarding PA counseling, including barriers and facilitators. The interviews were conducted by the lead author, who has significant qualitative interview experience, and was trained by a faculty mentor (DS) with over 15 years of research experience. A "think aloud" cognitive interview approach was used to assess face validity and determine interview duration [45]. The guide was pilot tested to an oncological care provider from Nebraska Medicine and before being finalized for use in the data collection. Verbal informed consent was obtained before each interview. Semi-structured interviews were conducted by one investigator (GK) with additional probing questions used when needed for clarity or detail. Each interview lasted approximately 25 minutes and were audio recorded with permission. After the interview, the interviewer made field notes regarding mood, gestures, and noteworthy occurrences (gestures were not applicable to telephone interviews). The participants received a \$50 prepaid visa gift card as compensation for participation in the study.

## *2.4. Semi-Structured Interview*

The interview guide was developed in accordance with the 5A guidelines (Appendix 1), which involved clinicians inquiring about (or assessing), advising, agreeing upon, assisting with, and arranging follow-up concerning patients' efforts to change their behavior. This framework serves as a model for brief counseling that may encourage PA [46]. It is employed to discuss current behavior, recommend changes, evaluate readiness for change, assist with goal setting, and schedule follow-up. The 5As have been validated as a cohesive framework for behavioral therapy in primary care [46]. Consequently, to ensure the objectivity and trustworthiness of our study, we developed a qualitative semi-structured interview guide based on the 5As framework. This approach enhanced the credibility of our findings, rendering them more reliable and credible [47].

## *2.5. Ethical Considerations*



This study was approved by the University of Nebraska Medical Center Institutional Review Board (IRB# 0468-23-EX). The study objectives and voluntary participation were explained to the participants, and informed consent was obtained before beginning semi-structured interviews. Confidentiality was assured by using a code number instead of names (e.g., Oncology care providers (OCP), 1, 2,3, etc.) and removing identifying information such as their name and affiliation from the transcripts before data analysis. All audio recordings and transcripts were saved securely. The Standards for Reporting Qualitative Research (SRQR) guidelines were followed in this study [48].

2.6. Data Analysis

The interviews with oncology care providers were audio-recorded, transcribed verbatim, and anonymized. Initial automatic transcription was performed using Otter.ai©, followed by meticulous review and correction by the lead author to ensure accuracy. The transcripts were subsequently uploaded to MAXQDA 2024 (VERBI Software, 2024) for data analysis.

The study utilized thematic analysis to demonstrate the concepts of framework analysis following the five processes of familiarization: defining a thematic framework, indexing, charting, mapping, and interpretation [49]. The analysis involved reading transcriptions multiple times to understand participants and their responses, identifying important phrases and rephrasing them broadly, forming and confirming meanings through team discussions, categorizing themes, and creating a comprehensive description of themes.

The rigor of the study was achieved by employing well-known qualitative research methodologies to enhance reliability and dependability. Peer debriefing and triangulation methods were employed to examine participants' responses and produce qualitative thematic results [43]. The lead author deductively created a codebook using semi-structured interview questions. Two researchers, GK and PC, reviewed five randomly chosen transcripts representing approximately 25% of all the participants and coded them according to the codebook. The coding was checked for similarities and inconsistencies, and both researchers met to discuss any conflicts in the coding. The lead author continued coding the transcripts because of the high level of agreement. The researchers took notes during the coding process to discover similarities in oncology care providers' responses to the interview questions and preliminarily identify relevant themes [50].

The lead author examined the coded transcripts and notes from the coding process to develop and enhance themes in the data. The lead author (GK) aimed to identify three to five main themes in the responses of oncology care providers [51]. Themes and sub-themes were discussed with the research team (PC) so that they could be assigned more succinct titles and meanings. The two researchers then conducted a final review of all coded data and met to resolve any discrepancies through discussion until the full consensus was achieved.

3. Results

3.1. Sample Characteristics

In total, 16 oncology care providers completed the semi-structured interviews. Participants were predominantly middle-aged, with 43.8% aged between 40-49 years and a female majority (75%). The racial and ethnic breakdown of the participants showed that 75% were white, while Hispanics and Asians each account for 12.5%. Most participants were married (87.5%) and had worked in various clinical specialties, with 50% being staff physicians. The most common practice area was medical oncology (52.2%), which treated mixed cancer cases (37.5%). Most participants (93.3%) provided outpatient care, and the average number of years of practice was 11.75 years. For additional sociodemographic information, see Table 1.

**Table 1.** Socio-demographic characteristics of the oncology care providers (N=16).

Characteristic	N (%)
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Age (years)	
19-39	5 (31.3)
40- 49	7 (43.8)
50-59	2 (12.5)
60 and above	2 (12.5)
Gender	
Male	4 (25)
Female	12 (75)
Race/ Ethnicity	
White	12 (75)
Hispanic	2 (12.5)
Asian	2 (12.5)
Marital Status	
Single	2 (12.5)
Married	14 (87.5)
Clinical Specialty	
Staff Physician	8 (50)
Nurse Practitioner	2 (12.5)
Registered Nurse	2 (12.5)
Physician Assistant	2 (12.5)
Registered Dietician	1 (6.3)
Social Worker	1 (6.3)
Clinical Practice	
Medical Oncology	9 (52.2)
Surgical Oncology	2 (12.5)
Radiation Oncology	1(6.3)
Symptom Management/Palliative care	2 (12.5)
Hematological Oncology	1(6.3)
Gynecological Oncology	1(6.3)
Cancer Treatment	
Breast Cancer	3 (18.8)
Hematological Cancer	3 (18.8)
Gynecological Cancer	1 (6.3)
Central nervous system Cancer	3 (18.8)
Mixed Cancer	6 (37.5)
Patient Type	
Outpatient	15 (93.3)
Inpatient	1 (6.3)
Years of Practice, mean (SD)	11.75 (±10.35)

3.2. Qualitative Findings

The qualitative data findings identified five emerging themes: (i) Perception of PA among oncology care providers; (ii) PA counseling practices by oncology care providers; (iii) Barriers faced by oncology care providers to PA counseling; (iv) Facilitators for PA counseling; and (iv) Desire expressed by oncology care providers for PA training and education (Table 2).

**Table 2.** Summary of Themes and Sub-themes related to physical activity counseling within the oncology care context.

Theme	Subtheme	Example Quote
Perception of Physical Activity among	Defining physical activity	"Being active in just about any capacity, whether it's walking, aerobics, yoga."

Oncology Care Providers		
Physical activity counseling practices	Advice on physical activity	<i>"Usually, we start with small goals...to make them doable, manageable and seem achievable."</i>
	Assessment of Physical Activity	<i>"Well, when they're first coming in for screening, we ask a lot of their social and previous history..."</i>
Barriers to physical activity counseling	Lack of knowledge related to physical activity guidelines	<i>"I don't know if there is a specific guideline."</i>
	Lack of training related to physical activity counseling	<i>"Wasn't ever touched [physical activity] upon with any population, really, but definitely not cancer patients."</i>
	Low priority for physical activity counseling	<i>"I don't ask specifically questions on their current physical levels of physical activity."</i>
	Not being the right person to advise on physical activity	<i>"It's not part of a checklist if you're just the case manager."</i>
	Time constraints	<i>"The physicians don't seem to have time in their clinical role."</i>
	Limited resources for physical activity counseling	<i>"Honestly, nothing. Because we don't have any particular thing that we tell patients..."</i>
	Limited Referral opportunities	<i>"Our physicians, I'm so sorry. I don't see our physicians referring them to PT or OT either."</i>
	Inadequate health status of cancer survivors	<i>"And obviously, if it's going to hurt them, if they're already losing weight and not eating enough, I'm not going to tell them to increase physical activity."</i>
Facilitators for physical activity counseling	Environmental issues	<i>"I have patients that live in different parts of Omaha that don't feel safe walking outside."</i>
	Health benefits related to physical activity	<i>"Definitely mental health...I mean obviously also improves your circulation, lung health, cardiovascular."</i>
	Knowledge of physical activity guidelines	<i>"150 minutes of moderate intensity physical activity a week for cancer survivors."</i>
	Resources available in the community	<i>"A clinical trial where they are looking at so they give patients a Fitbit, and they get health coaching."</i>
	Interdisciplinary Support	<i>"My case manager discusses [physical activity] with patient."</i>
Desire for PA training and education	More education on physical activity	<i>"I guess the biggest thing is I want to know, if they're able to do their, you know, activities of daily living and unable to function."</i>
	Training	<i>"I feel like it's easier to have webinars or, you know, Zoom. Meeting</i>

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*conferences too are fine, but many people if it is more accessible if we do virtual."*

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### 3.2.1. Theme 1: Perception of Physical Activity Among Oncology Care Providers

This theme highlights a comprehensive and inclusive understanding of what constitutes PA in the context of oncology care. Oncology care providers broadly define PA as any form of movement that breaks the cycle of sedentariness, extending beyond traditional exercises to include daily tasks and movements. A participant illustrates the diverse nature of PA by referencing *"being active in just about any capacity, whether it's walking, aerobics, yoga."* Another oncology care provider illustrates a broad sense of PA *"Physical activity to me is very broad. I would say all like being physically active, not being sedentary, and moving around."* Other oncology care providers have discussed the incorporation of both structured and everyday activities. For example, one oncology care provider stated, *"I think being moving around in walking, running, stair-stepping elliptical, I think of these are part of physical activity, regular exercise."*

### 3.2.2. Theme 2: Physical Activity Counseling Practices by Oncology Care Providers

Related to PA counseling practice, two subthemes were identified: advice and assessment of PA.

#### 3.2.2.1. Advice on Physical Activity

The subtheme of PA advice from oncology care providers reveals the provision of tailored advice with small and achievable goals, which is a supportive approach for encouraging PA among cancer patients. Encouraging small, achievable goals is a common strategy to build confidence and motivation, for instance, one stated *"Usually, we start with small goals...to make them doable, manageable and seem achievable."* This approach helps patients gain trust in their bodies and the process of reintegrating PA into their lives.

The advice is inherently flexible, acknowledging that the amount and type of activity will vary greatly among cancer survivors: *"It's pretty much whatever they're able to do. So, so be very individualized."* This flexibility allows for adjustments based on the patient's health status and response to treatment. Oncology care providers often start with a foundational goal that is personalized, considering the patient's pre-treatment activities, physical limitations, and personal preferences. For example, one provider elaborates on activities, *"you can go outside and do a brisk walk for 30 minutes. You can walk up and down the stairs in your home...you can use body weight."*

#### 3.2.2.2. Assessment of Physical Activity

The assessment of PA by oncology care providers encompasses various strategies for understanding and gauging PA levels in cancer patients. Most oncology care providers verbally assessed their patients' PA levels. Oncology care providers gather insights into patients' social and previous histories, often during initial screenings, to identify past and current PA engagement. One provider explains, *"Well, when they're first coming in for screening, we ask a lot of their social and previous history where they'll normally say like, I'm an avid runner, or I used to play softball."* This initial assessment helps to understand the patients' baseline and potential interest in physical activities. Conversations about PA extend beyond identifying activities. Oncology care providers also delve into the details of patients' daily routines to understand their mobility and sedentary patterns. As one provider puts it, *"So I asked, generally, my first question is, what is your typical activity during the day, so just sort of get a gauge of what they're doing most days."* This comprehensive inquiry covers various aspects, from job-related activities to leisure time, and provides a holistic view of the patient's lifestyle.

Additionally, to systematically evaluate PA needs, specific tools and guidelines are employed, such as the Short Physical Performance Battery (SPPB) and the National Comprehensive Cancer Network (NCCN) guidelines, which include questions tailored to cancer survivors: *"We do a short*



performance physical battery with our bone marrow transplant survivors and kind of see where they are at with balance and walking, kind of make our recommendations from there." The approach to assessing PA among cancer patients by oncology care providers is characterized by a detailed, patient-centered methodology. Specific assessment tools were used through personalized inquiries.

### 3.2.3. Theme 3: Barriers Related to Physical Activity Counseling

#### 3.2.3.1. Lack of Knowledge Related to Physical Activity Guidelines

This subtheme reflects oncology care providers' acknowledgment of a gap in specific, universally accepted PA guidelines for cancer patients. Oncology care providers expressed uncertainty about the existence of detailed PA guidelines, indicating a significant barrier to offering consistent PA counseling or advice. For example, one provider stated, *"I don't know if there is a specific guideline,"* highlighting the ambiguity surrounding the PA recommendations. Another remarked, *"I'm not really aware of any particular guideline-based recommendations,"* underscoring the perceived absence of clear, authoritative PA guidelines for cancer survivors. The responses further highlight a profound uncertainty about guidelines, for example, *"I think that there is some recommendations from the American Cancer Society and Susan Komen... but I don't know what they are actually like and the exact specifications of them."* This shortfall is not confined to a lack of awareness about general guidelines; it extends to profound uncertainty about any specific guidelines tailored to the needs of individual cancer patients or survivors. One provider noted that *"there are no real specific ones that would be related to kind of individual patients [cancer survivors] and recommendations [PA] for that."*

#### 3.2.3.2. Lack of Training Related to Physical Activity Counseling

Oncology care providers revealed a significant barrier in their practice: a pronounced deficiency in formal training and education related to counseling cancer patients on PA. The gap is highlighted by oncology care providers' observation that education/training in PA indicates a systematic shortfall in healthcare education. For example, the oncology care providers echoed that *"wasn't ever touched [PA] upon with any population, really, but definitely not cancer patients."* The brevity of this training is further lamented by other providers, who describe their education on PA for cancer patients as *"minimal and likely very vague"* and *"Very little, probably."* Such statements underscore the inadequacy of current training programs to equip healthcare providers with the knowledge necessary to offer patient-specific PA advice.

#### 3.2.3.3. Low-Priority for Physical Activity Counseling

This subtheme reflects a widespread lack of emphasis on PA counseling for cancer survivors among oncology care providers. A notable response is acknowledging a lower priority, for example, *"I don't ask specific questions on their current physical levels of physical activity."* Furthermore, cultural reflections such as *"it's not in our culture to be active"* and direct admissions of not asking about patients' PA levels underscore broader societal and clinical oversight.

#### 3.2.3.4. Not Being the Right Person to Advise on Physical Activity

When asked about PA counseling practices, oncology care providers indicated that they felt unqualified or inappropriate to provide PA counseling. Oncology care providers suggest reasons such as not being part of the patient's long-term care team or feeling that their primary role does not include prescribing PA. For example, *"it's not part of a checklist if you're just the case manager"* and *"I see a patient maybe sometimes one or two years out from surgery, and I don't really address physical activity"* illustrate a common belief that their position does not align with providing PA counseling. Additionally, the oncology care provider acknowledges the potential value of PA but recognizes their role's limitations, which articulates this cautious approach *"Sometimes professionally, it may not be my place to talk about physical activity."* Another provider echoes this approach by referring patients to

physical therapy rather than advising on PA directly, *"No, I don't... But I will say this: it benefits you. And I think you should go to physical therapy."*

### 3.2.3.5. Time Constraints Due to Other Clinical Responsibilities

This subtheme points to the barriers oncology care providers face due to time constraints, which hampers their ability to offer comprehensive counseling on PA to cancer patients. Oncology care providers articulate the challenges of limited appointment durations, noting, *"the physicians don't seem to have time in their clinical role,"* and highlighting the struggle for those with high caseloads, *"But if you were to ask like a case manager with a higher load, they wouldn't have enough time."* Another provider vividly describes the effects of time constraints in clinical practice, detailing the challenge of addressing a patient's comprehensive needs within a limited timeframe. For example, *"a new patient, you get an hour... Follow-up patients get 20 minutes."* Furthermore, it emphasizes the brevity of patient interactions, highlighting the prioritization of immediate medical concerns over wellness and lifestyle advice such as PA. One provider noted, *"And then when we follow up, and we have a 20-minute appointment, to discuss, you know, their treatment, or scans and how they're tolerating it and all their symptoms."*

### 3.2.3.6. Limited Resources for Physical Activity Counseling

This sub-theme underscores the limited knowledge of accessible resources in the community. The availability or lack of awareness of supportive materials or programs, such as *"Honestly, nothing. Because we don't have any particular thing that we tell patients... We really don't have any resources that we can provide to the patient,"* pointing to the absence of tangible support for patient engagement in PA. Further, the disconnect between potential referral sources or past programs and current practice is touched upon, with comments like *"I think there used to be like a LIVESTRONG for Survivor. I don't even know if that's around anymore."*

### 3.2.3.7. Limited Referral Opportunities

This theme reflects a gap in oncology care, where there is a noticeable deficiency in directing patients towards physical therapy (PT) or occupational therapy (OT) for PA advice. One participant noted the disparity in patient care, stating, *"our physicians, I'm so sorry. I don't see our physicians referring them to PT or OT either,"* another provider's admission highlights the procedural barriers, *"But I don't refer unless the doctor tells me to,"* indicating a dependency on physicians' directives for referrals, which can stifle proactive patient support.

### 3.2.3.8. Inadequate Health Status of Cancer Survivors

Limited health conditions as a barrier to PA counseling in oncology care emerge from the insights shared by oncology care providers. These limitations encompass a wide range of physical, mental, and emotional challenges faced by cancer patients, which significantly impact their ability to engage in PA. One participant notes the direct impact of patients' current health status on PA counseling, stating, *"And obviously, if it's going to hurt them, if they're already losing weight and not eating enough, I'm not going to tell them to increase physical activity."*

Specific health conditions such as neuropathy, fatigue, and the effects of surgery or chemotherapy introduce additional complications. For instance, *"Oh, just long-term side effects from their treatments make it difficult if they have neuropathy. Fatigue? I think those are the big ones"* and *"Yeah, not just chemotherapy. But you know, hormone-blocking agents...they also cause side effects."* These quotes underline diverse health issues that can deter PA engagement. Additionally, the emotional and mental toll of cancer treatment, including depression and loss of motivation, further complicates patients' ability to engage in PA.

### 3.2.3.9. Environmental Issues

This subtheme underscores the significant impact of patients' living environment on their ability to engage in PA. They note, *"I have patients that live in different parts of Omaha that don't feel safe walking outside,"* underscoring how perceived safety and the quality of local infrastructure, such as sidewalks, can deter patients from engaging in outdoor PA. This sentiment was echoed by another, who noted the specific challenges posed by *"the older areas of town, you know, maybe tripping hazards and then smooth or some places there are no sidewalks,"* pointing to the physical barriers that can limit safe PA opportunities.

The risk of infection is another significant environmental barrier for cancer patients, whose immune systems are often compromised by their treatment. As one provider explains, *"some of them have to be very aware of their outdoor settings as far as risk for an infection, depending on air contaminants,"* highlighting the need for patients to navigate their environments carefully to avoid potential health risks. Additionally, the current global health landscape further complicates this, as pointed out by one oncology care provider, *"Gotta be careful with how I mean because the cancer patients' immune system is shot. They have to be careful about getting in contact with patients who are or people who are sick, changing of the seasons, you get the flu. Now we have COVID,"* which highlights the increased vulnerability of cancer patients to infectious diseases and the need for careful consideration of when and where to engage in PA.

### 3.2.4. Theme 4: Facilitators of Physical Activity Counseling

#### 3.2.4.1. Health Benefits Related to Physical Activity

The health benefits of PA for cancer patients are widely recognized and emphasized by oncology care providers, highlighting its significant impact on both physical and mental health. They highlight how PA enhances circulation, lung health, and cardiovascular fitness, and significantly benefits mental health. For instance, *"Definitely mental health...I mean obviously also improves your circulation, lung health, cardiovascular."*

Moreover, oncology care providers acknowledge that PA protects against cancer risks and recurrence. For example, *"I know that obesity is associated with cancer risk and also cancer recurrence for several different cancer types and that physical activity or being physically active is protective for cancer risk, even irrespective of weight."* Improvements in fatigue, energy levels, and mitigation of treatment side effects such as chemotherapy-induced peripheral neuropathy are also significant benefits. For example, *"I would say improvement in fatigue and energy levels...maintaining strength, which can also improve recovery rates. The mental and emotional benefits, as well as the collective,"* illustrate the wide-ranging benefits of PA.

#### 3.2.4.2. Knowledge of Oncology Care Providers on Physical Activity Guidelines

Oncology care providers play a crucial role in promoting PA among cancer survivors by leveraging established guidelines from reputable organizations. One provider recommends, *"150 minutes of moderate-intensity physical activity per week for cancer survivors,"* aligning with widely recognized standards for maintaining health and supporting recovery. This recommendation is echoed by the American Institute for Cancer Research, which, as another provider notes, suggests *"75 minutes of high intensity, physical activity"* alongside *"stretching and weight training, two days a week, at least two days a week."* References to the American Cancer Society's (ACS) PA guidelines further reinforce the consistency of these recommendations across professional sources, with another provider stating, *"Yes, we commonly reference American Cancer Society physical activity guidelines."* These guidelines offer a structured approach to PA that balances intensity, frequency, and variety to support the overall health and recovery of cancer survivors.

#### 3.2.4.3. Resources Available in the Community

The availability of community resources to support PA among cancer survivors enable a proactive approach by oncology care providers to integrate PA into survivorship care. Insights from

oncology care providers reveal initiatives such as clinical trials offering health coaching and Fitbits, yoga programs, and specific PA-focused programs in the YMCA.

One innovative approach mentioned involves a clinical trial where patients receive a Fitbit and are randomized to receive health coaching, illustrating the use of technology and personalized support to encourage PA: *"a clinical trial where they are looking at so they give patients a Fitbit, and they get health coaching."*

Community programs such as yoga classes offered for free at specific locations provide opportunities for gentle, restorative PA suitable for various survivor needs: *"I believe there is a yoga program at the Village Pointe campus that they do have about once a week and may be offered for free to one patient a month."*

Additionally, the LIVESTRONG program at the YMCA was frequently cited as a valuable resource, offering specialized training in cancer survivorship and addressing long-term side effects: *"Yeah, so like I said, there are a few organizations in town that help with things. And so there is a program, the LIVESTRONG program, I think it's called it the way that helps quite a bit."*

Other resources include *"A Time to Heal"* and *"Project Pink"* for survivors and innovative solutions like the *"chicken soup workout"* on YouTube. By leveraging technology, specialized programs, and accessible fitness opportunities, the providers aim to facilitate PA as a key component of cancer recovery and long-term health.

#### 3.2.4.4. Interdisciplinary Support

The collective insights from oncology care providers emphasize a team-based approach to oncology care, where the encouragement and facilitation of PA are viewed as a shared responsibility.

Interdisciplinary referral processes have emerged as another facilitator in the holistic care of cancer patients, underscoring the collaborative effort among oncology care providers to integrate PA into patient care. These referrals span a range of specialties, including psychiatry, PT, OT, nutrition, and lymphedema therapy, highlighting the diverse needs of cancer survivors and providing a comprehensive approach to addressing these needs. One provider noted the importance of addressing mental health alongside physical health, stating, *"If we notice that our patients have any troubles with depression, we do recommend them to our psychiatrist. And I know they recommend activity."* This emphasizes the recognition of the interplay between physical and mental well-being and the role of PA in improving mental health. Frequent referral to PT is highlighted by several providers, reflecting the critical role of physical therapy in cancer recovery: *"I refer to PT a lot,"* and *"I refer them to physical therapy, a lot of times, many of the lymphedema from breast surgery. So, I do recommend patients."* These referrals are tailored to address specific physical challenges faced by cancer survivors, such as lymphedema, muscle aches, and reduced range of motion. Additionally, the role of nurse navigators in facilitating these referrals is also highlighted, indicating an infrastructure that supports efficient coordination of care: *"in cancer, we're pretty lucky we have nurse navigator. I can just say, Hey, can you refer for this patient to physical therapy."*

Support from other interdisciplinary providers also facilitates PA counseling for cancer patients, underscoring a collaborative, multidisciplinary approach within oncology care. This comprehensive support network involves a diverse range of professionals, including case managers, fellows, surgeons, radiation oncologists, medical oncologists, nurse case managers, physical therapists, and advanced survivorship practice providers, all of whom play a vital role in discussing and encouraging PA as part of patient care. One provider explains the integrated approach within their clinic, stating, *"my case manager discusses [PA] with patient. Then I have fellows in my clinic, they also discuss [PA] with patients, surgeons, radiation oncologists who are on our team, they also discuss it [PA] with patients."* Additionally, nurse case managers and survivorship advanced practice providers are specifically mentioned for their roles in discussing PA with patients, *"Our nurse case managers would? And of course, if they're going to physical therapy, they would? Also, we have survivorship, advanced practice providers that talk [PA] with the patients after their therapy."* This indicates that, beyond immediate



medical care, there is an infrastructure to support patients in adopting and maintaining PA as part of their lifestyle post-treatment.

### 3.2.5. Theme 5: Desire for Physical Activity Training and Education

#### 3.2.5.1. More Education on Physical Activity

Oncology care providers have expressed keen interest in expanding their knowledge and resources regarding PA to enhance their support for cancer survivors. One foundational aspect provider mentioned was understanding the patient's ability to perform daily activities, as highlighted by the statement, *"I guess the biggest thing is I want to know if they're able to do their, you know, activities of daily living and unable to function."* This concern underlines the importance of assessing patients' functional capacity. The need for more information about the available resources for PA has also emerged. Providers are looking for *"information on resources that maybe I don't know about would be,"* indicating a desire to discover new avenues to support patients' engagement in PA. Similarly, for the sentiment, *"Um, I would say that some just being directed to the resources can be helpful. As is well known, this is beneficial. So, I do not think I need significant training, but just like being directed to the resources,"* suggests that accessing well-curated information on PA resources could greatly enhance providers' ability to guide their patients. Moreover, staying updated with the latest PA guidelines is another area where providers see room for improvement, as one mentions, *"I need to get up to date on my guidelines."* This reflects a commitment to ensuring that patient advice is grounded in current evidence and recommendations. Lastly, the value placed on patient educational materials is evident, with providers seeking *"very practical resources, you know, infographic type stuff that I can use for patients."* Such materials are crucial for simplifying complex information and making it more digestible and actionable for patients.

#### 3.2.5.2. Training

Oncology care providers preferred virtual and online training on PA counseling for cancer patients because of their convenience and flexibility. Virtual training methods, such as webinars and zoom meetings, are highlighted for their accessibility and ease of integration into providers' schedules. One provider noted, *"I feel like it's easier to have webinars or, you know, Zoom. Meeting conferences are too fine, but many people if it is more accessible if we do virtual,"* emphasizing the appeal of virtual learning environments in today's healthcare setting.

However, the importance of in-person training for immersive learning experiences and opportunities for direct interaction is also recognized. Despite the widespread preference for virtual training, the value of in-person learning experiences is also acknowledged, particularly for the hands-on engagement and direct feedback they offer: *"I like in person... I learned better when I see someone do something and then they can critique,"* and *"think going to a conference will probably be best, you can pay attention and devote time."* These perspectives highlight the perceived benefits of traditional learning environments for fostering deeper engagement and understanding.

## 4. Discussion

Increasing evidence supports the assessment of PA as a vital sign among cancer survivors by oncology care providers [14,39,52]. Assessing patients' PA during medical appointments might serve as a reminder to the patient, even if they have not followed the provider's previous suggestion to engage in PA [53,54]. Inquiring about patients' PA behavior indicates that their oncology care providers value the significance of PA in their well-being and recovery [55,56].

Finding from the study offers a unique perspective from oncology care providers on the concept of PA, presenting a broader interpretation that transcends the conventional view of cancer care. This research is among the first to explore how oncology care providers perceive 'physical activity,' which



they define not merely as scheduled exercise routines but as any form of movement that counters sedentary behavior.

Interestingly, in the present study, oncology care providers mostly relied on verbal assessments to understand the patients' prior or present experiences with PA. Assessing patients' everyday activities in detail enhances PA evaluation by uncovering their mobility and sedentary behaviors, which helps to develop natural ways to include PA into their daily lives [14,39,52].

Furthermore, some oncology care providers in the present study utilized the Short Physical Performance Battery (SPPB) and NCCN standards. This signifies a transition towards more organized and impartial PA assessments. PA is a crucial but complex construct to measure, especially within PA interventions aimed at assessing adherence to exercise prescriptions and examining associations with health outcomes [57].

In the present study, oncology care providers revealed an array of barriers that span knowledge gaps, infrastructural limitations, and environmental concerns. One major obstacle is the insufficient understanding of PA guidelines for individuals with cancer. Oncology care providers are unsure about the presence and details of these standards, which hinders their ability to provide consistent PA counseling. A pronounced deficiency in formal training in counseling cancer patients about physical activity compounds this issue. These results are consistent with prior studies showing that healthcare providers frequently lack sufficient training to recommend PA for cancer survivors, revealing a systemic deficiency in healthcare education [58–60]. Oncology care providers have acknowledged the need for more education and training on physical exercise to help cancer survivors. To achieve this, dedicated modules on PA counseling might be incorporated into medical and nursing curricula, and continuing education opportunities could be provided to current providers [39,61].

Oncology care providers have noted additional barriers, such as the lack of prioritization of counseling and the feeling among providers that advising on PA falls outside their professional responsibilities [32, 59, 60]. These feelings indicate a wider cultural standard in oncology care that downplays the importance of lifestyle changes. Time constraints and limited resources hinder practitioners from offering thorough counseling, raising questions regarding the practicality of incorporating PA guidance into standard care practices [61,62].

Oncology care providers have identified other barriers, including feeling unqualified to promote PA, insufficient community resources, and restricted referral options. These results align with those of previous studies conducted by Nadler et al. [32], Dilworth et al. [63], Hardcastle et al. [34], Schmitz et al. [39], and Mina et al. [64]. Implementing interdisciplinary care models with PA specialists might help prioritize PA counseling and clarify roles within cancer care teams, allowing all healthcare professionals to effectively address PA with patients [65–67]. Moreover, establishing referral systems for community resources or rehabilitation organizations could enhance the access to PA therapies [68–70].

Furthermore, cancer-related barriers, including poor health conditions and environmental factors such as living in risky areas or the threat of infection, make it harder for cancer survivors to engage in PA. Studies have regularly identified physical limitations, such as pain, fatigue, and medication side effects, as the main barriers. Clifford et al. [69] and Avancini et al. [70] have shown that physical side effects have a major impact on the activity levels of survivors. Additionally, barriers related to the environment, such as living in places that are thought to be dangerous or have an increased risk of illness, are also factors. This is consistent with the recent research conducted by Hirschey et al. [71], Jones & Paxton [72], and DeGuzman [73], who also recognize these difficulties. The convergence of these physical and environmental elements indicates a complex scenario of cancer survivors' involvement in PA. This highlights the necessity for customized strategies that consider not only the physical capacities and restrictions of survivors but also the surroundings in which they reside [74,75]. To overcome these obstacles, strategies could involve tailored exercise regimens that consider individual side effects and conditions, and community-wide initiatives focused on creating safer and more supportive environments for PA [57,66,76].

In our study, oncology care providers recognized various facilitators that emerged as multidimensional approaches in oncology settings to promote PA among their patients. Acknowledging the health advantages linked to PA, such as enhanced bodily and mental health, serves as a primary motivator for providers, which acts as a basis for integrating PA counseling into standard oncology care practices [77]. Moreover, utilizing established PA standards from trustworthy sources enhances the structure in which providers work, providing a clear, evidence-based approach to efficiently recommend PA [78,79]. Following the PA guidelines, counseling is consistent with current research, maximizing patient health and recovery [80,81]. Furthermore, interdisciplinary support in PA counseling is crucial [82]. A coordinated approach with different professionals creates a comprehensive care strategy that meets the diverse requirements of cancer survivors [32,39]. This strategy emphasizes the need to consider all facets of a patient's health, encompassing physical recuperation and emotional wellness, to enable a comprehensive approach to cancer care [81].

#### *4.1. Strengths and Limitations*

To the best of our knowledge, this is one of the first studies to qualitatively explore oncology care providers' perspectives on PA practices in their clinical settings in Nebraska. The strengths of the current study lie in the methods employed. The qualitative interview-based methodology enabled participants to express their opinions and experiences regarding specified issue areas. Additionally, the strength of the study lies in its systematic technique of gathering and analyzing data, which involves cross-referencing transcripts with audio recordings and field notes, as well as consensus-based triangulation among coders to ensure reliability and validity. Purposeful sampling was used to select a broad set of providers with different degrees of experience. Our research sets itself apart from previous studies [70,83] by including various healthcare professionals, including oncologists, nurses, and surgeons, who provide direct care and treatment to patients with cancer.

This study has limitations in its concentration in a specific geographical area and the possibility of self-reported biases from cancer care professionals. Additional studies with broader and more varied sample sizes are necessary to validate the applicability of these results. Moreover, there may be concerns regarding the self-selected sample, potentially resulting in the enrollment of oncology care providers who were motivated and enthusiastic about promoting PA to their patients. This could have impacted on the conclusions derived from this study. The semi-structured interview questions were designed in a way that intended to ask questions openly and to reduce the likelihood of oncology care providers feeling obligated to address PA with patients. However, social desirability bias may have caused oncology care providers to alter their responses to appear favorable.

## **5. Conclusion**

Oncology care providers demonstrate comprehensive awareness of PA, acknowledging its significance in everyday PA beyond the traditional engagement of activities. The study revealed barriers that hinder the successful counseling of PA for cancer survivors, including the lack of PA guidelines, insufficient training in PA counseling, and practical difficulties such as time constraints and limited resources. Despite these challenges, various factors facilitated PA counseling for cancer patients, such as the recognized health advantages of PA, understanding of current PA recommendations, availability of community PA resources, and support from interdisciplinary teams. Oncology care providers' request for additional information on PA and a preference for receiving related training virtually demonstrate their willingness to address these obstacles. This study emphasizes the intricate relationship between obstacles and the assistance available for PA counseling in oncology care. These findings point to the need for improving provider education, simplifying referral procedures, and more prominently incorporating PA into cancer care protocols.

**Supplementary Materials:** The following supporting information can be downloaded at the website of this paper posted on Preprints.org, Table S1: Socio-demographic questionnaire for Oncology care providers and Semi-structured questionnaire.

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