



# Experiences of cancer patients in receiving dietary advice from healthcare professionals and of healthcare professionals in providing this advice—a systematic review

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Received: 24 January 2023 / Accepted: 6 March 2023 / Published online: 25 March 2023  
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## Abstract

**Purpose** This systematic review investigated qualitative and quantitative studies exploring patients and healthcare professionals’ (HCP) experience of nutrition care throughout the cancer journey.

**Methods** Five databases were systematically searched for studies reporting on patient and healthcare professionals’ experience of nutrition advice.

**Results** Fifteen studies including 374 patients and 471 healthcare professionals were included. Findings indicate that patients desire more specific nutrition advice supported by members of the multidisciplinary team and delivered in appropriate and understandable language. Healthcare professionals have highlighted a lack of time, funding, dietetic roles, and knowledge as barriers to integrating nutrition as a standard part of cancer care. Five themes were identified (current provision of nutrition advice, optimal provision of nutrition advice, tension between patient values and nutritional or HCP priorities, providing evidence-based nutrition care, and practical barriers to nutrition advice provision).

**Conclusions** Further work is essential to better understand and address identified barriers and improve the provision of nutrition advice to this population.

**Implications for Cancer Survivors** Findings from this review will guide the delivery of nutrition advice for cancer survivors.

**Keywords** Nutrition advice · Cancer survivorship · Cancer journey · Healthcare professionals

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## Introduction

In 2018, there were 17 million new cancer cases globally, with numbers continuing to grow annually [1]. Nutrition is a central factor in the management of cancer [2]. Nutrition surveillance by healthcare professionals and referral to registered dietitians for nutrition advice and support should ideally start at diagnosis, continue throughout the cancer care continuum, and last into survivorship to preserve muscle mass and manage treatment-related side effects that interfere with dietary intake [3]. However, only one-third of oncology patients receive nutrition advice from the healthcare team at any point throughout the cancer journey [4], even when they have experienced weight loss [5]. One Irish study indicated that 45% of dietitian recommendations should have been made sooner than they were [6]. Weight loss and malnutrition are quite common [5, 7], as is loss of muscle mass [8], leading to poorer response to treatment [9], increased

complications and length of hospital stay [10], and negatively impacting survival [11].

Inadequate dietetic staffing and lack of integration of nutrition services within cancer care systems have been identified as major barriers to accessing and implementing nutritional care in the oncology setting [12]. Malnourished cancer patients experience more extended hospital stays, frequent hospital readmissions, and a poorer quality of life [13]. The expense of including nutrition within standard care (e.g. the cost of dietetic positions) could be compensated by savings in the cost of treatment [14].

The European Society for Parenteral and Enteral Nutrition has recommendations for the inclusion of nutrition (to identify, prevent, and treat malnutrition) at all stages of the cancer journey [15]; however, there is no requirement for oncology healthcare professionals to be aware of or to utilise these recommendations. In addition, the inclusion of nutrition education within non-dietetic healthcare curriculums is sporadic and many healthcare professionals lack the confidence and knowledge to integrate evidence-based nutrition advice into their practice [16, 17]. From a patient perspective, in a study of 1073 Irish cancer survivors, 89% indicated that nutrition was very/extremely important in cancer care and 45% reported some diet-related issue highlighting the desire and need for nutrition advice [5]. Those with cancer view nutrition as important during all stages of disease and during all types of treatment [18].

To support patient-centred care and to better understand the current situation from the perspectives of both patients with cancer and healthcare professionals, a critical synthesis of what is currently known is required. There has been no systematic review previously conducted in this area. This systematic review, therefore, aims to answer the following research question: ‘what are the experiences of cancer patients and survivors in receiving dietary information from healthcare professionals and of healthcare professionals in providing this information?’ This systematic review will critically synthesise knowledge from the past 10 years

regarding (1) the experiences of patients with cancer on receiving dietary information from healthcare professionals and (2) the experiences of healthcare professionals with respect to the provision of dietary information to those with cancer.

## Methods

The review protocol was registered in the PROSPERO database for systematic reviews (protocol ID: CRD42022348884) and is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines [19].

### Eligibility criteria

The PECOS (population, exposure, comparator, outcome, study design) framework was used to define the research question. Eligibility criteria for study screening are outlined in Table 1. Studies reported in peer-reviewed literature were eligible if data had been collected from oncology healthcare professionals or those with cancer. Studies in children or adolescents or adult survivors of childhood cancer were excluded as there may be different functional impacts and care pathways to adulthood cancers. Studies reporting on patients undergoing end of life treatment were also excluded as nutrition needs at this stage vary greatly to those on a curative treatment pathway. Included papers had to identify and have as a study aim patients’ experiences of receiving dietary information from a healthcare professional or healthcare professionals’ experiences of providing dietary information to those with cancer. In order to capture different aspects of provision and experiences, quantitative, qualitative, and mixed-methods studies were included. The search was limited to papers published in the last 10 years to ensure that current context was being explored. There were no limitations on cancer type or geographical location.

**Table 1** Inclusion and exclusion criteria

	Included	Excluded
Population	Cancer diagnosis or healthcare professional. Adults $\geq$ 18 years.	Childhood or adolescent cancer. No cancer diagnosis or not a healthcare professional < 18 years.
Exposure	Receiving dietary/nutrition or weight-related information from healthcare professional OR Providing dietary/nutrition or weight-related information to those with cancer	No mention of receiving or providing dietary/nutrition or weight-related information. Only views of family members or carers reported
Comparator	NA	
Outcome	Experiences or perceptions of receiving this advice OR experiences or perceptions in providing this advice	No measure of experiences or perceptions in providing or receiving this advice
Study design	Cross-sectional, observational, retrospective, qualitative English language only. Published in last 10 years	Interventional trial, review paper or conference abstract Non-English language. Published > 10 years ago

Dietary information was considered to be any written or spoken information provided around food, nutrients, dietary intake, nutrition status, and dietary strategies for managing the side effects of cancer or treatment, dietary strategies for managing body weight and body composition, and supplements (both nutrient supplements and oral nutrition supplement drinks), as well as any nutrition-related therapies. Experiences were defined as engagement with or barriers and facilitators to providing or receiving dietary information. Dietary information provision and experiences from family members and carers were excluded as this review aimed to capture the perspectives of individuals with cancer and oncology healthcare professionals to align with oncology models of care.

### Identification of studies

A systematic search of five databases (CINAHL, Embase, Ovid Medline, PsycINFO, and Web of Science) was performed on 19<sup>th</sup> July 2022 and updated in September 2022. Keywords used included *nutrition* or *diet* in combination with *cancer* or *oncology* and their relevant synonyms. The complete search strategy for Medline is included below. Searches were limited to papers published in English from 1 January 2012 to 19th September 2022. Citation searches of key authors and papers were also undertaken.

1. ((diet\* or nutrition\* or food\* or weight or nutrient\* or "body composition") adj4 (requirement\* or advice or advise\* or inform\* or know\* or support\* or educat\* or counsel\* or guidance or control\* or strateg\* or manag\* or intake\* or coach\* or recommend\* or supplement or supplements)).ti,ab. 302326
2. exp Diet Therapy/ or exp Diet/ or exp Dietary Supplements/ or Nutritional Requirements/ 413229
3. body weight/ or body weight changes/ or Overweight/ or Obesity/ or ideal body weight/ or exp Weight Reduction Programs/ 392340
4. 1 or 2 or 3 892734
5. (carcinoma\* or cancer\* or tumor\* or tumour\* or metast\* or neoplasm\* or malignan\* or oncolog\*).ti,ab. 3296066
6. exp "Cancer Survivors"/ 7451
7. exp Neoplasms/ 3707283
8. 5 or 6 or 7 4377377
9. exp Cross-Sectional Studies/ 432074
10. exp Observational Study/ 129432
11. exp Retrospective Studies/ 1041164
12. exp Qualitative Research/ or (experience\* or perception\* or perceive\* or "self report" or "self describe\*" or "self description" or opinion\* or attitude\* or "point of view" or "view point" or journey\* or narrative\* or perspective\* or interview\* or qualitative\* or story or stories or observational or "cross sectional").ti,ab. 2747248
13. 9 or 10 or 11 or 12 3702613
14. 4 and 8 and 13 13960
15. limit 14 to yr="2012—2022" 8193
16. limit 15 to (english language and humans) 7731
17. limit 16 to "all adult (19 plus years)" 5217
18. "Polycystic Ovary Syndrome"/ or ("Polycystic Ovary Syndrome" or PCOS).ti,ab 18873
19. (predict\* or prognos\* or prevent\* or bariatric or index or "Food and Drug Administration" or surveillance or screen\*).ti. 1063254
20. exp Tumor Necrosis Factors/ or ("tumor necrosis factor\*" or "TNF\*").ti,ab 286098
21. limit 17 to "review articles" 176
22. limit 16 to ("all infant (birth to 23 months)" or "newborn infant (birth to 1 month)" or "infant (1 to 23 months)" or "preschool child (2 to 5 years)" or "child (6 to 12 years)") 615
23. 18 or 19 or 20 or 21 or 22 1358694
24. 17 not 23 3448

### Study selection

All records identified from the database searches were first screened to remove duplicates (ALV), then titles and abstracts were independently screened by two researchers (LK and NOC) using the eligibility criteria as outlined in Table 1. The same two authors reviewed the full-text articles. Reference lists were assessed to ensure that no suitable studies had been overlooked. The questions used to guide this process included the following: Does the article relate to the provision of nutrition advice within healthcare settings? Does the article explore/describe either the cancer patient or professional experiences of the provision of nutrition advice? Does the article suggest any variations or barriers to the nutrition advice provided to/received by cancer patients?

A data extraction form was generated by the research team. Study information (title, authors, year) population, (cancer type (where relevant), age, gender, patient or healthcare professional), context (setting, location, treatment received, current treatment status, time since diagnosis, classification, e.g. pre-treatment, undergoing treatment, post-treatment), intervention and outcomes (provision of dietary information, engagement with dietary information, barriers and facilitators to providing dietary information, perceptions), and study methodology (design, recruitment, sample size, response rate, outcome measures, data analysis, and limitations) information were all collected. Data extraction was performed independently by one author (LK) and data were reviewed by two other authors (NOC and LR) for consistency and accuracy. In cases of disagreement, discussions

with all authors took place, with final decisions being made by consensus.

## Synthesis of data

References were managed in Endnote version 20 (Clarivate Analytics, Philadelphia, PA, USA), with extracted data being collated in Microsoft Excel software. Data was extracted by LK using a table developed by the research team and allocated to one of two categories: (i) the patient experience and (ii) the professional experience. Relevant findings were those that related to the inclusion criteria, including experiences in providing or receiving nutrition guidance. To ensure accuracy, NOC cross-checked all extracted data.

The quality of each study was assessed using the Mixed-Methods Appraisal Tool (MMAT) [20]. This single tool allows for a quality appraisal of studies of different designs [21, 22]. There are five questions focussed on core methodological criteria for each study design type, and each can be answered with “yes”, “no”, or “can’t tell”. A user guide ensures consistent quality across different reviewers [22]. Results can be found in supplementary table 1. While scoring is not recommended, a discussion of the quality of included studies is included in the results.

A narrative summary is provided for the quantitative studies [23, 24]. Thematic synthesis was undertaken for data extracted from the qualitative studies [25]. In this case, the quotes presented within the original papers were coded (LK). Descriptive themes were generated from these (LK and NOC) and finally, analytical themes were determined through discussion (LK and NOC) and refined through critical discussion and feedback with all authors. Quotations and authors interpretations were included in the qualitative synthesis. All studies, regardless of quality, were weighted equally in the synthesis.

## Results

Fifteen studies met the eligibility criteria and were included in the systematic review. Figure 1 outlines the search and screening process using a PRISMA flow chart. The reasons for excluding full-text articles can be seen in supplementary table 2.

### Design, sample size, and location

The majority of the studies originated from Australia ( $n=7$ ), one of these recruited from Australia and New Zealand with another from the USA and Australia [26–32]. The remaining studies recruited participants from the USA ( $n=3$ ) [28, 33, 34], UK ( $n=2$ ) [35, 36], Netherlands ( $n=2$ ) [37, 38], Ireland ( $n=1$ ) [39], and Canada ( $n=1$ ) [40]. The papers

were published between 2015 and 2022, with the majority being published in 2021 ( $n=7$ ) [26–28, 32, 35, 38, 39]. Three of the studies were quantitative (all used surveys) [27, 29, 39]. Two utilised a mixed-methods approach (survey and interviews) [35, 37]. The remaining ten studies adopted a qualitative interview methodology [26, 28, 30–34, 36, 38, 40]. Two of these were longitudinal [26, 32]. There were 845 participants in total (374 patients and 471 healthcare professionals). The quantitative studies varied in sample size from 51 [39] to 254 [35]. Qualitative interviews ranged in sample size from 10 [32] to 45 [37].

Six studies reported on the experiences of patients [26, 31, 32, 35, 38, 40] (Table 2), seven on the experiences of HCPs [27–30, 33, 34, 39] (Table 3), and two reported on both [36, 37]. These two studies have been included in both Tables 2 and 3; therefore, eight studies were included in the synthesis of patient experiences and nine studies were included in the synthesis of healthcare professionals’ experiences.

Five studies included head and neck cancer (HNC) patients with one of these also including lung cancer and lymphoma [26, 31, 32, 38, 40]. The remaining studies included patients with pelvic [35], prostate [36], and acute myeloid lymphoma (AML) [37].

Most studies included a range of HCPs [27, 28, 33, 34, 36, 39] with some focusing on one role, for example nurses [29, 37] and GPs [30]. HCPs specialised in a range of areas including prostate cancer, breast and non-Hodgkin’s lymphoma [33, 34], upper GI [27], HNC [28], prostate [36], AML [37], and general oncology [29, 39].

## Quality

Eight of the fifteen studies (53.5%) met all five criteria of the MMAT [26, 28, 31–34, 38, 40]. Three (20%) met four of the five criteria [30, 35, 36]. Two (13.3%) met three of the five criteria [27, 39] while the remaining two studies (13.3%) met two of the five criteria [29, 37]. Further information can be found in supplementary table 1.

### Quantitative findings

**Patient perspectives** While one study had a mixed-methods approach [35], the questions focused on dietary changes rather than experiences of nutrition support; therefore, no quantitative data has been presented relating to patient experiences.

**Healthcare professional perspectives** Three studies were quantitative in design [27, 29, 39] with one mixed methods [37]. Three included questionnaires designed by the research team conducting the study [27, 29, 37], while one utilised a questionnaire previously developed by the National

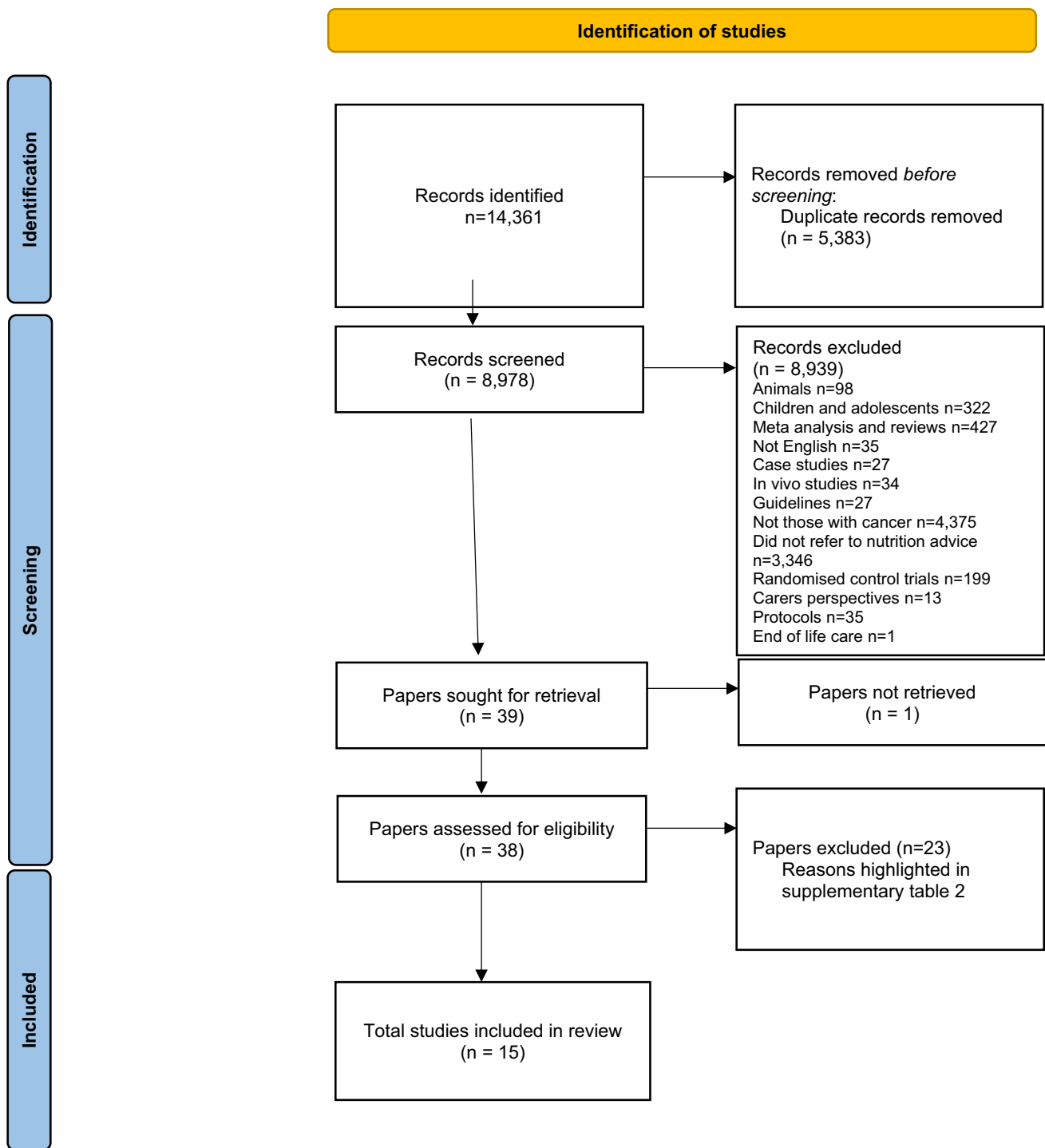


Fig. 1 Prisma flow chart

Institute for Health Research Cancer and Nutrition Collaboration [39]. Nutrition, malnutrition screening, and access to nutrition support were viewed as extremely important ( $\geq 95\%$ ) [27, 39], with nurses believing healthy eating would improve quality of life, mental health, weight status, activities of daily living, and prevention of other chronic diseases

[29]. Haematology nurses felt that patients appreciated when nutritional issues were recognised by HCPs and support provided [37]. While most recognised the dietitian as the primary HCP responsible for delivering nutrition advice [27, 39], one-third of nurses felt they were the primary person to address nutrition concerns [29]. Lack of time, resources, and

**Table 2** Studies detailing patients' experiences of receiving nutrition advice from HCPs

Author (year)	Aims	Population	Methods	Main findings
Alberda et al. (2017) [40]	To understand patients' experiences with nutrition care in the context of their treatment and recovery	10 individuals with head and neck cancer (mean age = 62.6 years, 2 females and 8 males, one patient had radiotherapy only; 6 patients had surgery, followed by radiotherapy; and 3 had surgery, followed by radiotherapy and chemotherapy) 10 individuals with oesophageal cancer (mean age = 63.8 years, 2 females and 8 males, one patient in this group had surgery only; 9 had radiation and chemotherapy first, followed by surgery)	Study design: Qualitative (interviews) Recruitment: purposeful and convenient sampling	Oesophageal cancer: experienced sudden changes in ability to eat post diagnosis and felt dietitian was missing at this crucial timepoint or not consistently available. During treatment felt had more consistent access and found information informative and supportive while being attentive to individual concerns, however some felt it was not detailed or specific enough. Post-treatment there was an option to continue contact over the phone Head and neck cancer: No structured advice given prior to surgery. Non-specific advice from surgeon to "put some weight on". Lack of specific instructions led to confusion. High-quality support during treatment, however some felt it was generic and not individualised to needs. Found calorie targets unrealistic given severity of side effects. There was a fear of being fed through a feeding tube if not compliant with nutrition advice, with some HCPs indicating this, adding fear and stress

Table 2 (continued)

Author (year)	Aims	Population	Methods	Main findings
Findlay et al. (2020)* [31]	To understand the perspectives of patients and their caregivers about nutritional care and how their unmet supportive care needs can be better addressed	Eleven participants (seven patients, four caregivers) took part in the interviews. Patients (4 male and 7 female, 81.8% were aged 50 years+) had completed radiotherapy (within last 6 months) with or without other treatment modality (surgery and/or systematic therapy) of curative intent for head and neck cancer	Qualitative – semi-structured interviews Not clear how recruited	Patients were unprepared for the severity of symptoms and indicated the importance of nutrition was not immediately evident but revealed itself over time. Patients felt isolated and out of their depth in the absence of adequate support following completion of treatment or discharge from hospital. Many expressed initial uncertainty regarding the need for referral to a dietitian; nevertheless, the value of their expertise was not only revealed over time but came to be viewed as vital treatment. Coordination among HCPs led to a more seamless experience. There was a loss of enjoyment of food While some people conveyed a thirst for information, others suggested a balance needs to be struck between being informed versus being afraid. Many felt overloaded and there was a desire for appropriate language Patients often received information regarding critical weight loss or feeding tubes from medical staff that conflict with the best available evidence Being informed about expected nutrition challenges by HCPs helped patients feel more prepared. There was reassurance in having access to a dietitian. While some valued large amounts of diverse information from HCPs, others felt overwhelmed Most valued nutrition care however, some had views that conflicted with nutrition-related recommendations, making them less inclined to take advice from HCPs. Where personal experience conflicted with recommendations, nutrition care was viewed negatively
Hazzard et al. (2020) [32]	To explore the nutritional care experience that patients with HNC have in a multidisciplinary clinic	Ten individuals with head and neck cancer (median age: 63 years, 6 males and 4 females, four were treated with Sx + RT and six were treated with CRT) from one regional cancer centre in Australia	Qualitative study design – longitudinal interviews (from diagnosis to 4 months post-treatment) A consecutive sampling of eligible patients to one clinic were recruited	

Table 2 (continued)

Author (year)	Aims	Population	Methods	Main findings
Hiatt et al. (2021)* [26]	To explore and understand patient and carer experiences of nutrition care from diagnosis of HNC to one year post-treatment completion	Twenty patients with head and neck cancer (mean age = 59, 15 males and 5 females, 6 had surgery, 6 had surgery + PORT and 8 had chemotherapy) were recruited from tertiary hospital in Australia	Qualitative study design – longitudinal interviews Purposive sampling to ensure a range of ages, treatment type, geographical location, tumour size, and gender	Some felt a lack of support in their nutrition views and withdrew from nutrition care. Despite this, most nutrition care was highly valued. After completion of treatment some wanted more open discussions on supplements and alternative medicine. Patients felt unprepared for the impact nutrition side effects had on their eating and drinking despite receiving nutrition care from HCPs. On reflection most found it very difficult to absorb all the information provided to them. Some also looked up nutrition information and support online but found it difficult to know what was reliable without HCP input.
Lize et al. (2021) [38]	To gain insights into experiences with information and support around the psychosocial consequences of reduced ability to eat	Twenty-four patients with head and neck cancer, lung cancer or lymphoma who had experienced nutritional problems due to their cancer or treatment. Most were male (62.5%) and in recovery or remission (71%) with a mean age of 63 years	Qualitative – interviews Patients were recruited via patient organisations for head and neck cancer, lymphoma, and lung cancer, supplemented by recruitment via specialist oncology nurses in a hospital in the Netherlands	Patients reported positive experiences when different HCPs worked and communicated well together and when they felt that HCPs recognised and addressed their needs. Negative experiences were experienced when it was felt HCPs only addressed topics within their own expertise and when physicians did not refer them to other HCPs such as dietitians that they felt would have benefited them. In these instances, patients felt they had to stand up for themselves to receive adequate support. Information from HCPs tailored towards the patients' goals was well received. Patients wanted nutrition information from HCPs as they reported confidence in their expertise. Negative experiences were reported by some when personal goals were ignored, when they felt misunderstood or not listened to and when they received unrealistic or inadequate advice.



Table 2 (continued)

Author (year)	Aims	Population	Methods	Main findings
Saltaouras et al. (2021) [35]	To explore dietary habits and experiences of nutritional support in patients with a cancer diagnosis who have received radiotherapy to the pelvic area	The survey was completed by 251 respondents (median age = 70, 49% prostate cancer, 22% rectal cancer, 31% radiotherapy only, 23% radiotherapy and chemotherapy, 18% radiotherapy and hormone therapy, 10% radiotherapy and surgery, and 19% radiotherapy, chemotherapy, and surgery) with 28 individuals (median age = 68, 46% prostate and 29% rectal cancer, 11% radiotherapy only, 18% radiotherapy and chemotherapy, 21% radiotherapy and hormone therapy, 18% radiotherapy and surgery, and 32% radiotherapy, chemotherapy and surgery) completing the telephone interviews	Mixed methods – survey followed by telephone interviews with purposive subsample Two groups of patients were recruited. The first group consisted of patients currently undergoing pelvic radiotherapy treatment with curative intent. The second group completed curative pelvic radiotherapy treatment 6 to 24 months before. Recruitment took place in a single cancer centre in England	Only 43% ( $n = 108$ ) had received dietary support from the healthcare team, it mainly focussed on healthy eating (75%). 68% ( $n = 171$ ) said they would like to receive additional dietary support Qualitative work further highlighted the lack of routine support and revealed a mix of views and emotions regarding the quality of the information provided. More interviewees described general discussions around healthy eating and very few reported discussions related to treatment side effects. For some, lack of advice about GI problems was a negative and stressful experience Some participants reported having a very positive experience of dietary support from the health professionals but others considered support inadequate
Sutton et al. (2017)* [36]	To explore the views and experiences of men diagnosed with localised prostate cancer and their partners about the provision of advice on diet and physical activity after diagnosis and treatment for localised prostate cancer	Sixteen men (mean age = 66.9 years, 4 radiotherapy and 12 surgery) diagnosed with localised prostate cancer and seven of their partners	Qualitative – interviews Convenience and snowball sampling from the team providing specific prostate cancer care at tertiary referral hospital urology department in the south-west of the UK was used to recruit individuals	There were differing accounts between patients and HCPs as well as between patients in some cases Some men were unable to recall receiving nutrition advice. They would have valued advice and adhered to it if provided. They did however indicate that it is difficult to recall discussions around the time of diagnosis. Many also believed that they already had a well-balanced diet and required no change. Leaflets that were provided were difficult to interpret for some Some patients felt that a HCP was a trusted and credible source of advice; however, if patients felt that the HCP was not following the advice provided themselves, this undermined the message Patients reported a strong evidence base as aiding their compliance

**Table 2** (continued)

Author (year)	Aims	Population	Methods	Main findings
Van Lieshout et al. (2022) [37]	To gain insight into patients' experiences and perceptions regarding nutritional problems and nutritional support	23 patients with acute myeloid leukaemia from several Dutch hospitals. 57% were female and the mean age was 53 years	Mixed methods Qualitative – interviews with patients Quantitative – surveys with nurses Individuals were recruited by a registered dietician or a nurse specialised in haematology in three Dutch hospitals chosen for their different nutritional support practices during intensive AML treatment	Nutritional support during intensive AML treatment offered peace of mind in most patients. Recognition of and attention to their eating problems from the multidisciplinary team of HCPs were regarded as valuable. It was highly appreciated when HCPs showed efforts to provide nutrition tailored to the patients' dietary preferences and individual nutritional needs and subtly encouraged them to eat  The differences in nutritional support practices between treating hospitals led to confusion and a reduced confidence in healthcare

\*Only patient quotes were included in the synthesis.

funding were common barriers cited to providing nutrition advice [27, 29, 39].

One study found that the majority of HCPs nutritionally screened inpatients but not outpatients [39]. Another study reported more barriers to providing nutrition advice in outpatient than inpatient settings (such as lack of funding and access to dietitians), with all barriers scoring higher in the outpatient setting [27], while enablers were similar or lower than in the inpatient setting. Dietitians reported more barriers than surgeons and fewer enablers in general [27]. A lack of standard procedures or support structures was also a common barrier [27, 29, 39] with the integration of nutrition into practice highlighted as vital [39]. Within the haematology sector, it was recognised as challenging but important to support rather than pressure patients to eat and that repeated emphasis may hinder rather than support efforts [37]. There was a lack of awareness of guidelines also demonstrated [37, 39]; in addition, nurses in one sector reported a lack of agreement with or doubt over the feasibility of current guidelines [37].

### Thematic synthesis

There were two themes shared across the patient and healthcare professional perspective: current provision of nutrition advice and optimal provision of nutrition advice. An additional theme was derived from the patient data: tension between patient values and nutrition recommendations or HCP priorities, and two themes from the healthcare professional data: providing evidence-based nutrition care and practical barriers to nutrition advice provision.

**Current provision of nutrition advice** The importance of nutrition was highlighted, with HCPs viewed as a reliable and credible source of information [36]. Despite this, several individuals reported receiving no nutrition advice at any point [26, 35, 36], with others indicating that it was only provided once treatment started [32].

“I’m a little bit disillusioned by it all, because no one at any stage, the day I was diagnosed, to this day now has mentioned diets ... not a sausage. Not anyone, not doctors, not nurses, not anyone” -prostate cancer patient [36]

Where dietitians were present early on, it was not always clear to patients why they were relevant [31, 40] until treatment had started, and nutrition impact symptoms and weight loss were experienced. Where advice was provided, it was typically welcomed and valued [26, 31, 32, 38, 40]. However, some felt the service could be improved and that information could be more specific, rather than generic [40].

**Table 3** Studies detailing healthcare professional experiences in providing nutrition advice to those with cancer

Author (year)	Aims	Population	Methods	Main findings
Coa et al. (2015) [33]	Healthcare providers' perspectives on the importance and feasibility of addressing behaviour change, specifically healthy diet, with cancer survivors	33 providers treating prostate, breast, or non-Hodgkin lymphoma cancers (e.g. oncologists, surgeons, primary care providers, nurses, dietitians) across academic ( $n = 22$ ) and community ( $n = 11$ ) clinical settings	Qualitative – interviews Recruited as part of a larger study	Dietary advice was brought up by cancer specialists if the evidence was considered strong, while primary care providers felt health promotion was important for all and reported treating cancer survivors the same as any other patients with regard to dietary recommendations There was no agreement on the best time to bring up dietary change and providers felt there were certain subgroups of patients who were more motivated The primary barrier to implementing change was reported as being patient fatigue
Deftereos et al. (2021) [27]	To determine practices, awareness, and perceptions of multidisciplinary clinicians with regard to malnutrition screening and provision of nutrition support	130 Australian HCPs (56% dietitians, 25% surgeons, 11% nurses, 8% oncologists) completed a survey. Most participants worked in public hospitals (80%), located in a metropolitan area (82%)	Quantitative – survey A 30-item online REDCap survey was distributed via professional organisations/networks between 1st September and 30th November 2020	Participants identified a high awareness of the importance of identification and treatment of malnutrition in UGI cancer surgery. However, reported practices varied and appear to be lacking in the outpatient setting. The main barrier identified in the outpatient setting was a lack of funding and dietitians

Table 3 (continued)

Author (year)	Aims	Population	Methods	Main findings
Hazzard et al. (2020) [28]	To explore what facilitates collaborative nutritional care for patients with HNC from the perspectives of different healthcare professionals	Forty-six interviews were completed with 17 radiation-oncologists, 12 nurses, eleven dietitians, and 6 speech-pathologists in the USA (two sites) and Australia (two sites)	Qualitative – interviews The first author spent 1 month at each of the four sites and during this time different healthcare professionals were shadowed and approached for recruitment. A snowballing technique was used	Dietitians were identified as an important facilitator of collaborative nutrition care. Having a dedicated team willing to communicate both formally and informally was also thought to promote collaborative nutrition care. Current team meetings were described as medically focussed with little time for nutrition discussion. Lack of time was a barrier to arranging additional meetings to discuss nutrition. Reviewing patients as an interprofessional team helped to ensure nutrition was prioritised and consistent evidence-based nutrition messages delivered. Clarity around the professional responsibilities and skills of their colleagues also facilitated collaborative nutrition care and allowed team members to understand and utilise the expertise that dietitians could offer
Keaver et al. (2021) [39]	To determine the current practices of Irish healthcare professionals working in the oncology setting of three hospitals with regard to nutrition screening, provision of nutrition advice and their training needs in this speciality	Fifty-one individuals completed the questionnaire. The majority were nurses (70.6%) working in general oncology care (80.4%)	Quantitative study design – questionnaires were distributed in the oncology day wards and outpatient departments in three hospitals in Ireland. HCPs were working with patients undergoing systemic anti-cancer therapies	Most screened inpatients, however only a small proportion screened outpatients. The majority reported providing nutrition advice to their patients. However, they reported low levels of confidence in providing nutrition advice, a low level of awareness of guidelines in this area and low levels of additional training undertaken. There was an awareness of the need for different intervention and advice depending on cancer type and stage, that early intervention is best and that nutrition should be a part of standard care however, it was felt that there was a lack of dietitians

Table 3 (continued)

Author (year)	Aims	Population	Methods	Main findings
Puhringer et al. (2015) [29]	To examine current healthy eating promotion practices, beliefs and barriers of cancer nurses in Australia and New Zealand	123 nurses responded. The majority (95.9%) were female, worked in general oncology (40%) and were based in public hospitals (84%). Mean age was $48.7 \pm 10.5$ years and mean years in practice was $23.0 \pm 11.7$ years	Quantitative – survey Australian cancer nurses were invited to participate via links posted on the Cancer Nurses Society of Australia (CNSA) website, while New Zealand cancer nurses were invited via an email from the Cancer Nurses Section of the New Zealand Nurses Organisation (NZNO)	Cancer nurses believed they were often the major provider of nutritional advice to their cancer patients (32.5%), a value marginally less than dietitians (35.9%) but substantially higher than oncologists (3.3%). The majority promoted healthy eating prior (62.6%), during (74.8%) and post-treatment (64.2%). Most cancer nurses felt that healthy eating had positive effects on the cancer patients' quality of life (85.4%), weight management (82.9%), mental health (80.5%), activities of daily living (79.7%), and risk of other chronic diseases (79.7%), although only 75.5% agreed or strongly agreed that this is due to a strong evidence base. Lack of time (25.8%), adequate support structures (17.3%) nutrition expertise (12.2%) were cited as the most common barriers to promoting healthy eating their patient

Table 3 (continued)

Author (year)	Aims	Population	Methods	Main findings
Smith et al. (2016) [34]	To explore clinicians' perspectives on capacity for health promotion, specifically dietary counselling	33 oncology providers (10 oncologists, 6 surgeons, 6 primary care physicians (PCPs), 3 nurses, 3 nurse practitioners, 2 social workers, a dietitian, a patient navigator, and a survivorship coordinator from two different medical systems (one community and one academic hospital) in Baltimore, USA. These all worked with breast cancer, prostate cancer, or non-Hodgkin lymphoma	Qualitative – interviews Purposeful recruitment through existing contacts in the two hospitals, followed by snowball sampling	Dietary discussions were viewed as part of participants' professional remit. Often prompted by patients' enquiries around actions to reduce risk of recurrence. Inclusion of dietary discussions within consultations tended to be determined by the cancer specialists' views on the strength of the evidence base linking nutrition and cancer. This was less so for PCPs who focussed more on health generally and the prevention of other chronic conditions. Time pressures and lack of expertise also dictated the extent to which diet was referenced or discussed. For many specialists nutrition was viewed as peripheral to their primary role which was cancer surveillance. Oncologists were viewed as having an important role to play in dietary discussions due to their influence and authority with patients. Access to dietitians was deemed an important resource
Waterland et al. (2020) [30]	(1) to report GPs' experiences of providing nutrition and exercise advice to their patients, and (2) from the GP perspective, to identify perceived barriers and enablers to further implementation of exercise and nutrition advice throughout the cancer journey		Qualitative – interviews Purposeful sampling to recruit GPs from a range of locations, years of practice and across the sexes. Flyers were distributed within the Victorian primary care practice-based research and education (VicREN) general newsletters and emails, on social media and via snowball sampling	Ongoing discussions around nutrition were viewed as an important aspect of care and important for general health. It was acknowledged that patients rarely attend GP for these discussions and that most information on this topic is obtained via social networks and the media Provision of recommendations needed to be sensitive to the patients' situations and perceived abilities A lack of GP resources in the area was noted with many feeling underqualified. There was a reluctance to refer to specialists outside their own clinic however Time and funding were identified as barriers. There was an uncertainty as to the expertise and experience of allied health professionals in cancer

**Table 3** (continued)

Author (year)	Aims	Population	Methods	Main findings
Sutton et al. (2017) [36]	To explore the views and experiences of healthcare professionals about the provision of advice on diet and physical activity after diagnosis and treatment for localised prostate cancer	Ten HCPs (Consultant Urological Surgeons, Uro-Oncology Clinical Nurse Specialists and Allied Health Professionals)	Qualitative – interviews Convenience and snowball sampling from the team providing specific prostate cancer care at tertiary referral hospital urology department in the south-west of the UK was used to recruit individuals	There were differing accounts between patients and HCPs as well as between patients in some cases. The majority of HCPs reported providing general rather than prostate cancer specific dietary advice. The level of advice provided was determined by perceived patients' needs or by their initiating of the discussion. Part of the HCP role was seen as signposting to existing resources. Some HCPs believed it was part of their role to provide advice with some using shock tactics. Many of the HCPs demonstrated awareness that interventions need to be tailored to the individual; however, this rarely equated to tailored advice being delivered HCPs believed that patients may not be willing to receive nutrition advice at diagnosis. However, some HCPs and patients themselves saw it as an opportune moment HCPs viewed the lack of a strong evidence base as a barrier to providing advice
Van Lieshout et al. (2021) [37]	To gain insight into haematology nurses' experiences and perceptions regarding nutritional problems and nutritional support	22 clinical haematology nurses recruited from 22 hospitals. 82% were working part time and 86% had greater than 5 years' experience in oncology	Mixed methods Qualitative – interviews with patients Quantitative – surveys with nurses One clinical haematology nurse of each of the 22 hospitals that provide intensive AML treatment in The Netherlands was recruited. The registered dietitians working at the haematology wards of these centres selected participants upon first registration after an invitation call	Haematology nurses perceive that patients show appreciation when their nutritional problems are recognised by HCPs and when nutritional support is provided. However, according to the haematology nurses' experiences, it is challenging but important to support rather than pressure patients to eat Only a small majority (59%) were aware of guidelines to support nutrition during intensive AML treatment. 9 (41%) disagreed with the guidelines. Of those that agreed ( $n = 13$ ), 8 questioned their feasibility

“Yeah, [the dietitian] was quite good, but again it’s just sort of... a check in, not an advisory sort of thing”—head and neck cancer patient [40]

HCPs themselves reported providing generic nutrition advice with a focus on healthy eating [30, 33, 34, 36].

“I give them leaflets like Living with Prostate Cancer and prostate cancer charities. So by and large I leave them to read the information. Give them a generic sort of attention to health and exercise”—urological surgeon [36]

“it’s usually just saying, “You should lose weight. You should exercise.” That’s you know a very common thing we repeat”—surgical oncologist [34]

There was a recognition that this overlapped with advice for treating other chronic diseases also, allowing for a more holistic approach to be taken [34]. Some healthcare professionals indicated that they did not treat those with cancer any differently than those without when it came to the nutrition advice provided [33, 34].

“If they have a history of cancer I typically don’t talk to them any differently”—primary care provider [33]

Patients welcomed information, particularly that which was individualised or addressed their current experiences [26, 31, 32, 40], although some patients regretted it on delivery, due to feelings of being overwhelmed or overloaded with information [31]. Others thought it was not possible to feel prepared no matter what level of information was provided [26].

Many patients reported a desire to have an awareness of what to expect in terms of the impact of cancer on diet and body weight [26, 31, 32, 40]. Many felt unprepared for the realities that occurred [26, 31, 40], in particular regarding the amount of weight lost [26, 40].

“completely and utterly flummoxed and out of my depth”—head and neck cancer patient [31]

For some, there was a feeling of being overwhelmed and having difficulty taking on board the nutrition information provided due to the enormity of the diagnosis [26, 32]. Others felt that using simplified layman language could assist [36].

“Because I’m not medically minded, those [leaflets] went above my head”—prostate cancer patient [36]

In addition, it was felt that HCPs could communicate in a more patient-friendly manner [31, 40], explaining what is meant by certain phrases, avoiding medical jargon and not being so explicit about outcomes such as death.

“[The doctor said]... “send me an email when you’re eating normally.” I said, “What sort of normal?” He

said, “Just normally, like before you saw me, just anything and everything”—head and neck cancer patient [31]

“He [doctor] said, in no uncertain terms, he told me straight out, “it’s going to be the nasogastric tube, hospitalisation.....or I’d die. I’d die from malnutrition”—head and neck cancer patient [31]

From a healthcare professional perspective, there was a feeling that nutrition was part of their role (including GPs, nurses, oncologists, surgeons, primary care physicians) [28, 30, 34, 36], with the dietitian being highlighted by HCPs as an important facilitator in collaborative nutrition care [28]. While GPs saw a larger role for themselves in providing nutrition support [30], other HCPs (including oncologists, surgeons, primary care physicians and nurses) were willing to engage in providing nutrition advice during routine practice [34] or felt that signposting to and going through existing nutrition resources was part of their remit while problematic cases or ongoing issues should be referred to a dietitian [36].

There was an awareness that a lot of interactions have a medical focus, such as cancer review clinics with oncologists [34]. For patients in this case, HCPs felt that their priority was more on receiving “good news” than on nutrition guidance. This was also highlighted by GPs who indicated that patients do not necessarily attend them for lifestyle advice, they come with their own agenda, and so it is up to the HCP to ensure that nutrition is included [30]. This was noted as being particularly difficult when the patient arrived with an acute need [30].

“what they really want to hear from me is there’s no sign of cancer”—medical oncologist [34]

“the top of their priority list is not always to hear about nutrition, exercise and lifestyle ... but you still try to weave it in ...”—GP [30]

For others, they only felt the need to advocate for change if the patient was overweight.

“I’d usually say to them, there isn’t any restriction and they don’t need to change what they are doing because you know it probably won’t impact unless somebody is overweight”—clinical nurse specialist [36]

**Optimal delivery of nutrition advice** Positive experiences arose from multidisciplinary team interactions [26, 32] as it led to a sense of security around overall care and it was felt that there was always someone to address questions. Individuals reported a willingness to follow nutrition advice if it was provided [36].

“[the oncology nurse, dietitian and speech pathologist] give me the answers, if they do not know they go away and find out”—head and neck cancer patient [32]



HCPs felt that ongoing nutrition conversations were important throughout the cancer journey [30, 33, 34], to present plenty of opportunities for patients to ask questions and discuss nutrition [34], and because the nature of the advice often changes throughout the cancer journey [30]. It was also important to integrate throughout, as patients themselves might not be aware that they are ready for nutrition advice and implementing dietary changes [33]. For GPs, who might not see patients again for 12 months once they start treatment, it was important to start nutritional advice early [30].

“It’s an ongoing process, not sort of a set and forget”—GP [30]

“talk about that almost every visit with almost every patient too. It’s pretty rare that it doesn’t come up...I would say the reason I counsel every visit is because I think that they might not even be aware they’re finally at a point where they’re a little bit more ready for change”—primary care provider [33]

“They go off to the wilderness, for the 12 months while they are having treatment and then they come back to us ... so that’s why I try and get them early”—GP [30]

**Tension between patient values and nutrition recommendations or HCP priorities** There was an incongruence between patients’ beliefs and nutritional priorities/recommendations [26, 31, 32, 37, 40]. This was particularly the case for weight loss, where patients welcomed this while HCPs tried to address and reverse it [26, 31, 32, 37]. In one case, it was indicated that a weight loss of up to 10% was “okay”, a conflict with current guidelines [31].

“I’m a little bit lighter, which is better.... Not the best way to lose weight, but... [laughs].”—head and neck cancer patient [32]

Patients did not always believe in or were satisfied with the advice being provided by their HCPs and, in these cases, were less likely to follow the advice provided [26, 32, 37, 38, 40].

“at some point in the oncology programme, you will of course have to deal with the dietician and then you will get a piece of paper that says what you must eat, I was thinking – you know what I do with that this piece of paper? I throw it in the bin. I was thinking, go ahead and eat it yourself if you are sick, there is so much food on that list, even a normal [healthy] person cannot digest it in one day!”- lymphoma patient [38]

Advice sometimes appeared unrealistic for patient’s current situation and sparked a belief that the HCP did not understand the reality of what they could manage [32, 40]. In other cases, it came across as “pushy” and not considering the patients’ need for a slower transition to change [32]. In

addition, where HCPs did not appear to have healthy lifestyles or where they were overweight or obese, patients were less likely to view them as credible [36].

“All they want is to make sure that I do eat!... They do not know my taste; I know my taste. I’m the only one who knows, nobody else”—head and neck cancer patient [32]

“I was very disappointed about a [HCP] who was obese telling [me] what to eat ... if [they were] within a reasonable weight [themselves]. But if somebody presented information to me, what like they did, I just wouldn’t take any notice of it at all ... I think you’ve got to practise what you preach”—prostate cancer patient [36]

In other cases, the patients were concerned about the guidance, such as being told it was okay not to eat for a few days, which conflicted with current recommendations [37].

“they said ‘no, no it doesn’t matter, so what if you don’t eat for a few days’, and then I got, er, got a bit panicky”—acute myeloid leukaemia patient [37]

Confusion arose where HCPs provided conflicting opinions about what is best practice and appropriate [40].

“The oncologist thinks I was silly not having the feeding tube; the surgeon thinks I’m crazy to have one”—head and neck cancer patient [40]

**Providing evidence-based nutrition care (HCP)** Several studies [28, 33, 34, 36] indicated that the perceived strength of the evidence base around nutrition and cancer dictated the inclusion of dietary advice particularly by cancer specialists. One individual indicated that it gave them the confidence to feel “equipped to actually go through a lot of the data on diet and exercise” [36]. It was indicated that the scientific base should be used when “advocating for a specialist dietitian” [28]. There was a call to increase the evidence base to showcase the financial benefit of having access to a dietitian on healthcare costs [28].

“That’s all about trying to show the decrease in healthcare costs that you actually see when patients are working directly with dietitians”—dietitian [32]

There was an awareness of the evidence base linking obesity and breast cancer recurrence, which facilitated discussions when patients asked what they could do to prevent recurrence [34]. In addition, there was a belief from some HCPs that there was a strong enough evidence base around lifestyle behaviours and cancer recurrence to “need to do an even better, stronger educational job for our patients by reinforcing to them that this isn’t just you know pretty

sounding pink ribbon language. This is real science that has been shown that these things work” [34].

However, not all HCPs shared this certainty around scientific evidence for dietary change and prevention or recurrence [33, 34, 36].

“I don’t see the data out there that suggests that once you have the diagnosis of cancer that it’s [dietary change] going to decrease your risk.”—nurse practitioner [33]

“Because a lot of the dietary stuff and things like that, the studies aren’t there. I always say things like, “Some people find it beneficial, some people don’t.” Rather than ... because we don’t have the evidence. So suck it and see, is always my usual standard”—clinical nurse specialist [36]

It also became clear that patients may not apply the same scrutiny, at least from the healthcare professionals’ perspective with many following non-evidence-based advice found online [30].

**Practical barriers to provision of nutrition advice** It was clear that the provision of nutrition advice was characterised by what was lacking in many studies [28, 30, 34]. Lack of access to a dietitian for support and multidisciplinary collaboration were presented as barriers by HCPs (radiation-oncologists, nurses, and speech-pathologists).

“We do need access to the dietitian.... I think the main barrier becomes access”—radiation oncologist [28]

It was highlighted that nutrition visits were not usually covered by insurance, with one individual referring patients to a national cancer charity phone line to receive advice instead [34]. GPs had a similar issue where additional time spent discussing nutrition would not always be covered by the patient’s insurance [30]. In addition, it was clear that there needed to be funding available to have a dietitian on the team [28] and that to refer to a dietitian externally would cost patients money which they might not have [30].

“Yeah, the fact you don’t get funded for spending a lot of time with patients”

“I’ve never initiated a referral to a dietitian. Ever, which is probably pretty poor ... But I’m also mindful of the cost; I live in a lower-middle class area, so I suppose I potentially leave that to certain cancer teams, and most of my patients don’t have private insurance”—GP (Waterland et al., 2020).

Lack of time prevented collaboration between HCPs [28], by preventing additional or extended multidisciplinary meetings. Time also limited the ability for HCPs to deliver advice when patient consultations are short [34].

“we’ve got multiple other patients we have to see and so to spend the extra 30 min that you probably need with that patient when there’s two others who still need your help then you have to cut short that discussion”—radiation oncologist [32]

“Ten-minute consultations are simply spinning the wheels in the mud. You can’t do anything, because you don’t have time to do anything”—GP [30]

Lack of HCPs confidence and knowledge contributed to decisions to provide nutrition advice [30, 34]. Physical resources were lacking with the development and provision of the same being useful [30].

“I have more of a game plan when it comes to smoking cessation than when it comes to anything else”—primary care practitioner [34]

“I think having resources that are simple and easy to use that are fairly generic so that [they] can be used for most cancers and a handout for patients would be incredibly useful”—GP [30]

“If we had more resources to turn them to”—radiation oncologist [34]

## Discussion

This systematic review synthesised available research on the experiences of patients in receiving and HCPs in delivering nutrition advice in oncology settings, to gain insight into how nutrition advice can be further enhanced in current practice and to better support patient-centred care. The issues raised from a HCP perspective have direct implications on the delivery of nutrition advice to cancer patients. A strong evidence base was a facilitator to providing nutrition advice while lack of time, funding, dietetic roles, and knowledge were common barriers. Understanding these barriers and facilitators will help inform how best to support HCPs in delivering nutrition advice. There is currently considerable variation in practice, which was very clear when exploring the patient perspectives.

Key themes raised by patients were related to inconsistency in the provision of advice. This related to whether they received advice or not over the course of their cancer trajectory, but more often advice was only provided during the treatment phase when eating issues and nutrition-related changes had occurred much earlier. There was a desire to be informed about what was to come; however, this needed to be delivered in appropriate language, that was easy to understand and did not generate fear. Patients with low health literacy are more likely to report a poorer experience of care and have a lower quality of life [41]. HCPs need to have the skills to deliver nutrition information in an easily

understandable way, using appropriate and understandable language that does not add stress to the individual. The Irish Cancer Society, in recognition of the importance of this topic, have a 20-min self-guided course in conjunction with the National Adult Literacy Agency for HCPs on improving communication [42].

Multidisciplinary team involvement in the delivery of nutritional advice for cancer patients was viewed very positively. A multidisciplinary team approach (including oncologists, surgeons, radiologists, nurses, and allied healthcare professionals) is viewed as “gold standard” in oncology care and ensures that patients’ needs (social, psychological, physical, and nutrition) are met [43, 44]. A recent position paper examining guidelines and new evidence in oncology nutrition indicated that nutrition needs to be positioned at the centre of multidisciplinary care, as one of its five recommendations to optimise oncology care [45]. It is positive to see from this systematic review that in practice, patients are in favour of and report better experiences when a multidisciplinary team acknowledges nutrition. A recent randomised controlled trial comparing a multidisciplinary team five-step nutrition intervention to standard care found improvements in quality of life, anthropometric measures, symptoms, and function in gastroenteric cancer patients undergoing chemotherapy [46].

There was a conflict at times between patient beliefs or needs and healthcare professional recommendations [26, 31, 32, 37, 40]. This was particularly the case with regard to weight loss. This matches results from a recent survey of a representative sample of 1000 Irish adults, where just under one-third indicated that they believed weight loss during cancer treatment was positive if the patient was overweight, with a further one-third unsure [47]. Healthcare professionals need to have an understanding of, and appreciation for, patients’ beliefs, needs, and realities, while also finding a way to communicate when that belief is detrimental which is an important component of patient-centred care [48, 49]. Research has shown greater patient satisfaction, perceived outcomes of care, and commitment to treatment when there is a shared understanding on the issue [50, 51].

These themes primarily focus on a desire from patients to have access to nutrition information that is specific, detailed, and individualised that matches their beliefs and needs, and is delivered or supported by a multidisciplinary team using appropriate and understandable language. There is also an interest in understanding early on why a dietitian is relevant for their care. This fits well with growing evidence and changes in practice regarding rehabilitation, with nutrition being a key component of multimodal prehabilitation [52–55]. Prehabilitation can provide a sense of control for patients while also optimising response to treatment and survival [56].

Key themes raised by HCPs include a recognition that current practice is largely medically focused which can act as a barrier. Importantly, practice is starting to become more patient-centred, hence moving away from the traditional provider driven, disease focused model [57], which may help to address this barrier. Additional barriers include differences in individual patient motivation; advice will typically not be provided by specialised HCPs unless there is a solid evidence base and when delivered, it typically focuses on generic advice. Patients have indicated that they want individualised rather than generic nutrition advice from HCPs [58]. Therefore, addressing this discrepancy may help to improve effectiveness of the nutrition advice provided. Finally, a lack of resources, funding, time, and knowledge all impact on the ability to include nutrition in consultations; a finding that has been echoed in other studies also [16, 17, 59]. These findings will help support the development of interventions that are fit for purpose within a complex healthcare system. Understanding barriers to practice can assist in implementation planning. It can also provide baseline data for intervention development frameworks such as the behaviour change wheel [60] and the Medical Research Council framework for complex interventions [61].

Studies included in this systematic review have suggested several issues that help us to better understand the barriers for HCPs in delivering nutrition advice. While it is important to ensure that HCPs feel confident and competent in providing this guidance, it is also important to understand that increasing knowledge alone will not be enough to change current behaviours [62]. HCPs work to deliver the best patient outcomes with limited resources [63, 64]. In this instance, until lack of time, funding and adequate dietitian posts are addressed, nutrition advice will likely not be routinely provided. The European Union Health Policy Platform chose “Integrated Nutrition Cancer Care” as a thematic network to focus on for 2021/2022 [65]. As a result of Europe’s beating cancer plan [66], the EU commission launched inter-speciality training funding in 2021, to ensure that HCPs can receive training in quality of life, mental, psychosocial and nutrition support. When nutrition is integrated into clinical cancer care pathways as standard practice, it could help to ensure that the current medical focus is broadened, leading to more MDT awareness of its role, a view supported by patients in this systematic review.

Interestingly, HCPs put a strong emphasis on the evidence base and, in some cases, choose not to deliver nutrition advice if they feel there is not sufficient evidence. However, quantitative findings indicated that HCPs typically are not familiar with current best practice guidelines [17, 37, 39], which could potentially make delivering advice to patients with cancer less likely. In addition, the information vacuum generated when HCPs choose not to provide nutrition advice

is being filled by low-quality information obtained from unregulated sources [67].

There was less advice provided and more barriers to delivering advice in the outpatient setting. Those accessing services through this route are more likely to be post-primary or active treatment and further in the survivorship journey. This is concerning given the continued importance of nutrition, the persistence of nutrition impact symptoms [68], weight management issues [69], and prevention of other non-communicable diseases [70]. In addition, it has been shown that those who do not receive advice from their healthcare team look elsewhere, typically online [4]. Recent work has indicated a lack of nutrition recommendations for cancer survivors on national health and support group websites in Ireland and Spain [71, 72], on websites found through common searches [73] as well as in phone applications [74]. Therefore, there is a need to ensure evidence-based advice is available for this cohort.

## Limitations

The majority of papers were from Australia and so may not reflect the experiences of HCPs from Europe and the USA. Within the patient research, most focussed on those with head and neck cancer, which has a very detrimental impact on the ability to eat and nutrition status [75] and so is unlikely to reflect the patient experiences of individuals with other cancer types each with their own unique impacts. There is a need to explore the patient experiences of those with other cancer types and in other countries and regions to fully understand the current situation. There does appear to be a growing body of research in this area, with most of the papers included being published in 2021.

## Conclusion

This systematic review presents a synthesis of currently available research exploring the experiences of cancer patients receiving and healthcare professionals providing nutrition advice. Findings indicate that patients desire more specific nutrition advice supported by the MDT and delivered in appropriate and understandable language. There is also a need to ensure that the relevance of nutrition is clear from diagnosis and advice extends beyond the acute treatment phase. Healthcare professionals have highlighted a lack of time, funding, dietetic roles, and knowledge as barriers to integrating nutrition advice as a standard part of cancer care. Given the growing numbers of individuals diagnosed with and living with and beyond cancer, further work is essential

to better understand and address identified barriers and improve the provision of nutrition advice to this population.

**Supplementary information** The online version contains supplementary material available at <https://doi.org/10.1007/s11764-023-01359-4>.

**Author contribution** LK conceived the study and all authors contributed to the design. ALV conducted the searches. LK and NOC applied inclusion criteria, extracted the data, conducted thematic synthesis, and assessed the quality of included studies. LK wrote the manuscript and all authors commented on each version of this and agreed on the final draft for submission.

**Funding** This work was supported by the Health and Biomedical Strategic Research Centre at the Atlantic Technological University Sligo.

**Data availability** The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

## Declarations

**Ethical approval** This is a systematic review; therefore, no ethical approval was required.

**Conflict of interest** The authors declare no competing interests.

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