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RESEARCH

# Essential elements of optimal dietary and exercise referral practices for cancer survivors: expert consensus for medical and nursing health professionals

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## Abstract

**Purpose** To develop and establish expert consensus on essential elements of optimal dietary and exercise referral practices for cancer survivors.

**Methods** A four-round modified, Delphi method (face-to-face and electronic). In round 1, initial statements were drafted based on Cancer Australia's Principles of Cancer Survivorship and input from key stakeholders through a cancer preconference workshop. In round 2, the initial statements were distributed to a panel (round 1 participants) to establish consensus by rating the importance of each statement using a five-point Likert scale. Statements that required significant changes in wording were redistributed to panel members in round 3 for voting. Round 4 was for consumers, requiring them to rate their level of agreement of final statements.

**Results** In total, 82 stakeholders participated in round 1. Response rates for survey rounds 2 and 3 were 59% ($n=54$) and 39% ($n=36$). Panel members included nurses (22%), dietitians (19%), exercise professionals (16%), medical practitioners (8%), and consumers (4%). The mean "importance" rating for all essential elements was 4.28 or higher (i.e., fairly important, or very important). Round 4's consumer-only engagement received responses from 58 consumers. Overall, 24 elements reached consensus following some revised wording, including the development of three new statements based on panel feedback.

**Conclusion** Our developed essential elements of optimal dietary and exercise referral practices can help provide guidance to medical and nursing health professionals relevant to dietary and exercise referral practices. Future research should conduct an implementation intervention and evaluation of these essential elements to optimise dietary and exercise care in cancer survivors.

**Keywords** Health professional · Cancer survivor · Referral · Diet · Exercise

## Abbreviations

| | |
|---|---|
| GP | General practitioner |
| SD | Standard deviation |
| CDMP | Chronic Disease Management Plan |
| SCP | Survivorship care plan |

## Introduction

Dietary and exercise interventions play an important role toward managing the physical and psychosocial effects of cancer [1]. For these interventions to be successful, a multidisciplinary approach involving medical, nursing, general practice, and allied health professionals (e.g., dietitians, exercise physiology, physiotherapy) is essential [2]. However, a systematic disconnect exists between medical and nursing health professionals providing cancer care, and allied health professionals providing specialist dietary and exercise interventions to cancer survivors, where cancer survivors do not reliably receive information, support, or referrals to dietary and exercise interventions [3]. Medical

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and nursing health professionals are a vital centrepiece to supporting positive health behaviour change of cancer survivors as trusted agents of credible health information, with regular engagement at key moments of cancer care transition [4–6]. Acknowledging diet and exercise as cornerstones of quality supportive care [7–9], medical and nursing health professionals can educate cancer survivors on the importance of diet and exercise, reinforce behaviour change, facilitate referrals to general practitioners (GPs) and allied health professionals [10], and direct cancer survivors to evidence-based diet and exercise resources [5, 11, 12], such as those provided by international and national diet and exercise organisations and cancer societies [13–18].

While medical and nursing health professionals understand the importance of dietary and exercise education and support for cancer survivors, and acknowledge their role as key conduits of referral to general practice and specialist services [19, 20], they also report multiple barriers including inadequate resourcing, time, knowledge, role clarity, and a lack of standardised referral pathways [20]. To overcome these barriers, guidance is required for medical and nursing health professionals, in terms of what advice they should provide, when to provide the advice, as well as how and when to refer cancer survivors to dietitians and exercise professionals [20]. Indeed, cancer survivors should be referred to dietitians and exercise professionals, ideally with experience in cancer care, for individually tailored diet and exercise programs [21–23]. Collaboration with medical and nursing health professionals, given they also have knowledge, resources, and practical skills, can provide effective therapy and support behaviour change [14, 24]. Unfortunately, there is limited consensus among medical and nursing health professionals on the best process to engage dietitians and exercise professionals and effectively facilitate personalised dietary and exercise consultation, education, and interventions for cancer survivors [20]. For example, moderate-intensity aerobic training at least three times per week, with resistance training at least two times per week, is recommended for most cancer survivors [16]. However, the provision of dietary and exercise support can vary vastly between primary care providers based on when cancer survivors will be most receptive to receiving guidance [25].

Providing structured guidance and a systematic standardised approach will help medical and nursing health professionals to overcome professional-level and service-level barriers to refer cancer survivors to dietitians and exercise professionals and, ultimately, optimise dietary and exercise care for cancer survivors. Accordingly, the aims of this study were to (1) develop and (2) achieve expert consensus on essential elements of optimal dietary and exercise referral practices that medical and nursing health professionals can implement to streamline referrals to dietitians and exercise professionals for cancer survivors.

## Methods

### Study design

A Delphi consensus process was used comprising four rounds (one face-to-face and three survey rounds [Fig. 1]).

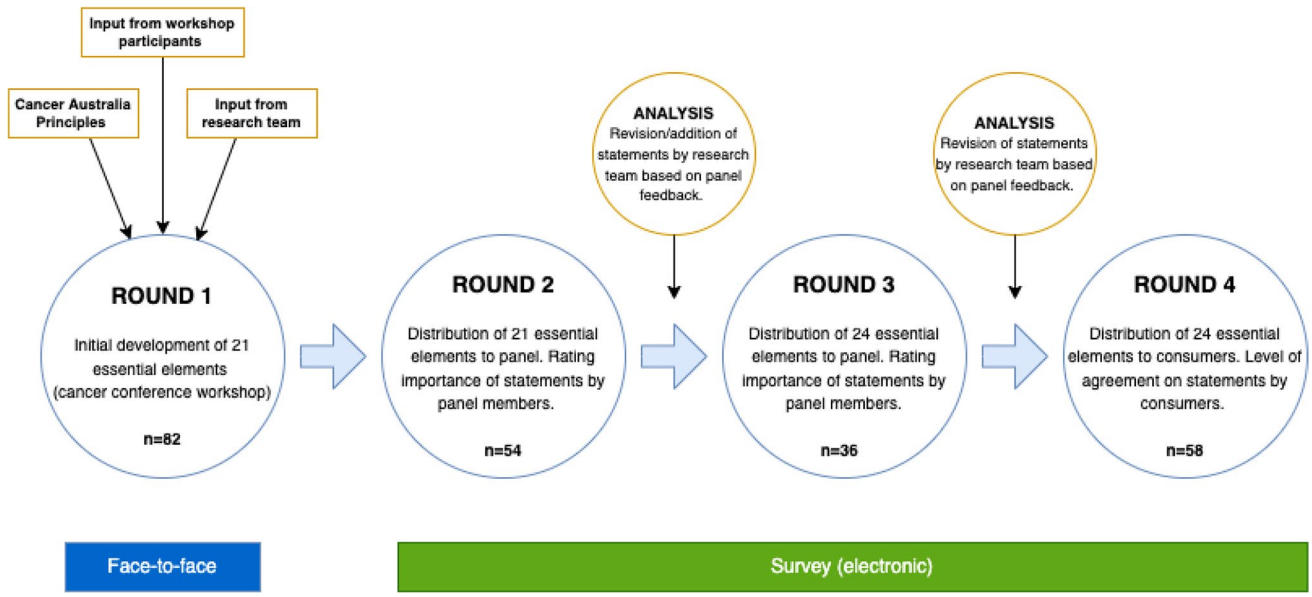



**Fig. 1** Delphi consensus process

Initial statements were drafted in round 1 based on Cancer Australia's Principles for Cancer Survivorship [26] and input from cancer stakeholders (e.g., consumers [i.e., cancer survivors, families and informal caregivers], cancer specialists, allied health professionals) at a cancer preconference workshop. Rounds 2 and 3 were used to iteratively develop and establish consensus regarding essential elements among consumers, health professionals, and researchers [27]. An extra round (round 4) was performed to ensure adequate consumer representation and obtain acceptability of the final statements. Delphi flexibility is important to ensure that the panel is representative of all stakeholders affected by the study's outcomes [28]. Ethical approval was provided by the Human Research Ethics Committee of Queensland University of Technology (HREC ID: 2,000,000,940). Informed consent for participation was obtained from all study participants. Data were collected and managed in accordance with the World Medical Association's Declaration of Helsinki.

## Round 1: workshop – development of initial statements

Participants attending a cancer conference were invited to attend a face-to-face pre-conference workshop, with facilitated activities structured following Cancer Australia's Principles for Cancer Survivorship [26]. Consistent with these principles, cancer survivors were defined as any individual living with cancer from diagnosis to end of life. Initial statements were developed by workshop participants (i.e., stakeholders from medicine, nursing, and allied health professions; consumers; and Cancer Council Queensland). Workshop facilitators comprised of clinician-researchers from cancer nursing and allied health professions, as well as consumer advocates. Cancer Australia's Principles of Cancer Survivorship were chosen to guide essential elements of optimal dietary and exercise referral practices as they provide a national framework that guides policy, planning, and health system responses to cancer survivorship, focusing on the care, health, and well-being of people affected by cancer (i.e., cancer survivors, families, and informal caregivers) [26]. Essential elements were then embedded within these principles as aspirational, governing statements to support medical and nursing health professionals to implement and evaluate best practices and achieve high-quality dietary and exercise support for cancer survivors [26].

Co-designing essential elements required consideration of (i) referrers; (ii) service providers; (iii) consumers; and (iv) resources and practice environments. Referrers primarily included medical and nursing professionals (e.g. GPs and specialists) caring for cancer survivors. Service providers included hospitals, health services, and community-based organisations with cancer services (e.g., public and private health sectors, or virtual health services). Consumers referred to people affected by cancer (i.e., cancer survivors, families and informal caregivers). Prior to facilitating draft statements, a presentation regarding the value and importance of diet and exercise for cancer survivors was provided, followed by focus groups to develop essential elements. Stakeholders were divided into six focus groups, each with two facilitators having at-least 5-years' experience in cancer care each. Facilitators asked participants to brainstorm relevant essential elements based on Cancer Australia's Principles of Cancer Survivorship including (1) consumer involvement in person-centred care; (2) support for living well; (3) evidence-based care pathways; (4) coordinated and integrated care, and (5) data-driven improvements and investment in research.

Focus groups ran for two rounds of 60 min each, with two allocated principles per round and per table, to ensure essential elements were discussed for each principle across two groups, resulting in each group discussing four of the five principles in total. Facilitators were tasked with (1) reviewing definitions and outcomes underpinning each principle to suggest changes specific to diet and exercise support for cancer survivors and (2) establishing draft essential elements of optimal referral practices to dietitians and exercise professionals that will guide implementation. Prior to the conclusion of the workshop, each facilitator presented their input to all stakeholders to enable broadened discussions. All focus group input was synthesised after the workshop by RJ and OAA with oversight from RJC and NHH. Each proposed essential element was categorised under one of the principles with constructive discussions (e.g., based on relevancy to referral practices) by the research team to produce initial representative statements outlining essential elements of optimal dietary and exercise referral practices.

## Round 2 to round 4: surveys – reaching consensus

### Panel selection

Workshop participants (round 1) and members of Queensland's Collaborative of Cancer Survivorship network were invited to join the consensus stakeholder panel via email. The panel was evaluated by the research team to ensure appropriate representation from a range of cancer specialists and primary care disciplines including allied health practitioners (dietitians, exercise physiologists, physiotherapists, and occupational therapists), consumers, medical practitioners, nurses, and health services researchers, and leadership from Cancer Council Queensland, with no standard criteria available to define panel members [29]. Sample size was determined using recommendations (i.e., minimum of 10–15

panel members) by Akins et al. [30] and Santaguida et al. [31]. To ensure a suitable sample size and increase response rates, a snowball sampling approach was used, whereby panel members were encouraged to send survey invitations to other relevant participants in their networks [32].

### Stakeholder surveys (Round 2 and round 3)

Drafted essential element statements determined in round 1 were distributed to the consensus stakeholder panel using an online survey (Key Survey; v8.1; WorldAPP, Hampshire, UK) in accordance with Delphi consensus process methods to establish expert consensus on the importance of determined essential element statements for optimal dietary and exercise referral practices. A free-text response was available to participants within each section of the survey to allow for suggested changes to each statement or new statements if required. Data on participant demographics were collected, including their current profession and role and time (in years) working in cancer care. Two rounds of online survey were provided to achieve consensus, with participants asked to rate the importance of drafted statements using a five-point Likert scale (1 = not important, 2 = slightly important, 3 = important, 4 = fairly important, 5 = very important), demonstrated to produce stable findings in Delphi studies [33]. Participants were given 4 weeks to complete each round and were invited to every round independent of the previous round. Those who did not respond to round 2 were permitted to participate in round 3, to allow for better representation of expert opinion and to reduce the chance of false consensus [34]. Consensus for each round was defined a priori as an agreement of ≥ 75% of panel members [29] scoring 3 or more, as per the five-point Likert scale. Responses from round 2 were used to revise statements (if required) or create new statements for the next round. Refined statements and new statements were redistributed to all panel members to confirm consensus with outcomes of the previous round.

### Consumer survey (Round 4)

Beyond the consumers and consumer organisation (Cancer Council Queensland) involvement in developing the initial and revised statements from prior rounds, a cohort of diverse cancer survivors and their caregivers were invited to participate in a final survey round. This involved a wide range of consumer networks and consumer types (i.e., adolescent and young adult cancer survivors; parents of childhood cancer survivors; advanced and metastatic cancer survivors) identified from existing networks of the research team and organisations such as Cancer Voices. Participants were asked if they agreed with each statement (i.e., yes/no) and to clarify their answers if needed, inclusive of alternate suggestions for any revisions. Consumer input is key to enhancing the appropriateness of the essential elements as they are likely to be consistent with the general needs and preferences of cancer survivors [35, 36].

## Data analysis

Focus group data from round 1 were categorised under the Principles of Cancer Survivorship using a deductive thematic approach. All findings from round 2 and 3 were reported and analysed using descriptive statistics (frequencies and central tendency). Mean and standard deviation (SD) and number (*n*; %) were calculated for each statement and count data were expressed as *n* (%). For Round 4, the quantitative analysis included percentages for each level of agreement (i.e., yes/no questions) for each statement. Consensus levels achieved during round 4 were not used to exclude statements, but to determine consumer acceptability (i.e., % of consumers who agreed with the statements) of the essential elements. Consensus was defined as ≥ 75% for all rounds (level of importance and consumer acceptability).

## Results

Eighty-two ($n = 82$) panel members participated in round 1, 54 completed round 2 (59% response rate), and 36 completed round 3 (39% response rate). In round 4, 58 consumers participated. Table 1 presents the demographics of participants in rounds 1 to 3; demographics were not collected for round 4. Gender distribution was consistent across the first three rounds, with a higher percentage of females in round 1 (82%), round 2 (87%), and round 3 (75%). Stakeholders were primarily nurses (22%), dietitians (19%), exercise professionals (16%) across the first three rounds, and consumers in the final round (round 4). In rounds 2 and 3, most respondents worked in clinical (42%) and research roles (63%), 23% with dual roles (e.g., clinical and research). Respondents worked in cancer care ranging from < 5 years to ≥ 20 years.

Group responses to each essential element across the five principles are presented in Table 2. Consensus (90% or more) was achieved for all 24 statements after 2 rounds. Statements that were significantly modified or newly created in round 2 were put forward for rating in round 3. Revisions included using more proactive language or splitting statements into two separate statements. Following rounds 2 and 3, eleven statements ($n = 11$) reached consensus with no changes; ten statements ($n = 10$) reached consensus with minor changes, and three new statements ($n = 3$) were developed based on panel feedback (Online Resource 1). These three new statements were related to education on diet and exercise for people affected by cancer and referrers and investing in research for dietary and exercise referral

**Table 1** Demographic characteristics of Delphi participants

| Characteristics,[1, 2] | Participants | | |
|---|---|---|---|
| | Round 1 ($n=82$) | Round 2 ($n=54$) | Round 3 ($n=36$) |
| Gender | *n* (%) | *n* (%) | *n* (%) |
| Female | 67 (82) | 47 (87) | 27 (75) |
| Male | 15 (18) | 7 (13) | 9 (25) |
| Profession | | | |
| Consumer | 3 (4) | 3 (6) | 1 (3) |
| Dietitian/nutritionist | 15 (18) | 11 (20) | 6 (17) |
| *Exercise professional*[3] | *8 (10)* | *11 (20)* | *9 (25)* |
| Exercise physiologist | 4 (5) | 8 (15) | 6 (17) |
| Physiotherapist | 4 (5) | 3 (6) | 3 (8) |
| Medical practitioner | 6 (7) | 4 (7) | 3 (8) |
| Nurse | 16 (20) | 13 (24) | 9 (25) |
| Researcher | 6 (7) | 1 (2) | 1 (3) |
| NGO[4] | 5 (6) | 1 (2) | 0 (0) |
| Other (not specified) | 8 (10) | 0 (0) | 1 (3) |
| *Other allied health* | *15 (18)* | *10 (19)* | *6 (17)* |
| Occupational therapist | 1 (1) | 1 (2) | 1 (3) |
| Pharmacist | 1 (1) | 1 (2) | 0 (0) |
| Psychologist | 3 (4) | 3 (6) | 2 (6) |
| Radiation therapist | 5 (6) | 3 (6) | 2 (6) |
| Speech pathologist | 4 (5) | 2 (4) | 1 (3) |
| Social worker | 1 (1) | 0 (0) | 0 (0) |
| Role | | | |
| Administrative | | 1 (2) | 0 (0) |
| Clinical | | 23 (43) | 15 (41) |
| Education | | 12 (22) | 12 (33) |
| Management | | 5 (9) | 2 (6) |
| Research | | 31 (57) | 25 (69) |
| Others | | 3 (6) | 0 (0) |
| Cancer care experience (years) | | | |
| 0 to 4 | | 14 (26) | 10 (28) |
| 5 to 9 | | 10 (19) | 7 (19) |
| 10 to 14 | | 11 (20) | 8 (22) |
| 15 to 19 | | 5 (9) | 2 (6) |
| 20 or more | | 14 (26) | 9 (25) |

[1]Role and cancer care experience were not collected in round 1

[2]Demographic characteristics of consumers were not collected in round 4

[3]Exercise physiologists and physiotherapists

[4]Non-governmental organisation

practices. In round 4, consumer acceptability was achieved for 15 of the 24 statements (63%) resulting in no revisions to those statements, with consumer feedback leading to the revision of wording in 9 of the 24 statements (37%) in round 4 (Online Resource 1).

Levels of consensus and means for each of the essential elements in rounds 2 and 3 (importance) and levels of consumer agreement in round 4 (consumer acceptability) are summarised in Table 2. Overall levels of consensus were higher in rounds 2 and 3 (99%) than in round 4 (80.4%). In rounds 2 and 3, overall mean ratings of importance were highest for principle 1 and 2 (4.7), followed by principle 4 and 5 (4.6), and lastly principle 3 (4.5). The highest rated elements from each of the principles included statements relating to education on diet and exercise (principle 1 and 2); evaluation of needs for referrals at key transition phases (principle 2); evaluation of needs for referrals based on evidence-based guidelines (principle 3); clear communication in healthcare (Principle 4); and translation of research into practice (principle 5). In round 4, essential elements with the

**Table 2** Level of consensus by round for the essential elements of optimal dietary and exercise referral practices (ranked in order of importance)

| Principle 1: Consumer involvement in person-centred care<br>*Outcome*<br>People affected by cancer are empowered to participate in shared decision-making and supported toward self-management according to their preferences. Informed and engaged consumers lead to better health outcomes and improved safety | | | | | | |
|---|---|---|---|---|---|---|
| Essential elements | | R2 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R3 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R4 agreement (% agreement of consumers) |
| Element 1 | People affected by cancer are informed about the benefits of diet and exercise for the management of cancer | New element | | 100 | 4.8 (0.40) | 77.6 |
| Element 2 | People affected by cancer are provided with information on dietary and exercise services available to support healthy lifestyles | 98.2 | 4.8 (0.59) | No changes | | 79.3 |
| Element 3 | People affected by cancer are advised to access existing dietary and exercise services available to support healthy lifestyles | 98.2 | 4.7 (0.74) | 100 | 4.6 (0.49) | 74.1 |
| Element 4 | People affected by cancer are empowered to take control of their health | 98.2 | 4.6 (0.71) | 100 | 4.6 (0.69) | 75.9 |
| Element 5 | People affected by cancer are provided with referrals to dietitians and exercise professionals when required | 98.2 | 4.6 (0.71) | 100 | 4.6 (0.69) | 74.1 |
| Principle 2: Support for living well<br>*Outcome*<br>Supportive care needs* of people affected by cancer are assessed to determine appropriateness of referrals to dietary and exercise services. People affected by cancer are supported to make informed lifestyle choices to promote wellness, manage treatment related side effects and comorbidities, and reduce risk of second and recurrent cancers. *Includes physical, psychological, social (including educational, financial, and occupational issues), cultural, information, and spiritual needs | | | | | | |
| Essential elements | | R2 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R3 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R4 agreement(% agreement of consumers) |
| Element 7 | People affected by cancer are best supported when referrers are informed about the benefits of diet and exercise for the management of cancer | New element | | 100 | 4.8 (0.47) | 94.8 |

**Table 2** (continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| Element 6 | People affected by cancer are best supported when their needs for referrals to dietitians and exercise professionals are evaluated at key transition phases (at diagnosis, during treatment, end of treatment or long-term follow up) | 100 | 4.6 (0.65) | 100 | 4.6 (0.65) | 91.4 |
| Element 9 | People affected by cancer are best supported when general practitioners (GPs) develop and review relevant Chronic Disease Management (CDM) plans and incorporate dietary and exercise referrals for optimal care | 100 | 4.6 (0.63) | No changes | | 89.7 |
| Element 8 | Referrers are informed about the available dietary and exercise community programs, support groups and other services, and how to refer to these services | 96.3 | 4.3 (0.97) | 100 | 4.9 (0.28) | 77.6 |
| Element 10 | People affected by cancer are best supported when models of care in the community are adapted to optimally support healthy lifestyles and sustainable lifestyle change | 100 | 4.5 (0.67) | 97.2 | 4.6 (0.73) | 89.7 |
| Principle 3: Evidence-based care pathways | | | | | | |
| *Outcome* | | | | | | |
| People affected by cancer receive consistent, safe, high-quality evidence-based dietary and exercise cancer care in line with Optimal Care Pathways, according to their individual circumstances and needs | | | | | | |
| Essential elements | | R2 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R3 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R4 agreement (% agreement of consumers) |
| Element 12 | Referrals to dietitians and exercise professionals are based on individualised needs in accordance with evidence-based dietary and exercise guidelines | 100 | 4.8 (0.58) | 100 | 4.7 (0.51) | 75.9 |

**Table 2** (continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| Element 15 | Referrals are directed to dietitians and exercise professionals (i.e., exercise physiologists, physiotherapists) with experience in cancer care (where possible) with consideration of risks | 94.4 | 4.6 (0.92) | 100 | 4.6 (0.61) | 79.3 |
| Element 13 | Referrals to dietitians and exercise professionals are based on regular screening of individual needs at key transition phases to facilitate timely referrals to appropriate services | 100 | 4.6 (0.69) | 99.9 | 4.5 (0.60) | 81.0 |
| Element 14 | Dietary and exercise referrals are prioritised for Indigenous people, CALD populations and other vulnerable populations | 98.1 | 4.5 (0.77) | 97.2 | 4.5 (0.77) | 74.1 |
| Element 11 | Referrals to dietitians and exercise professionals are based on grading systems or validated screening tools where possible to assist in identifying individual needs | 96.2 | 4.3 (0.82) | 100 | 4.3 (0.74) | 65.5 |
| Principle 4: Coordinated and integrated care | | | | | | |
| *Outcome* | | | | | | |
| People affected by cancer receive holistic patient-centred dietary and exercise services coordinated and integrated across treatment modalities, providers, and health settings. This includes public and private sectors, as well as specialist, primary, community-based, and not-for-profit services. Dietary and exercise care is delivered in a logical, connected, and timely manner for optimal continuity and to meet the individual needs of people affected by cancer | | | | | | |
| Essential elements | | R2 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R3 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R4 agreement (% agreement of consumers) |
| Element 17 | Between people affected by cancer, referrers, and service providers, there are clear, timely and effective bilateral communication processes adopted by various methods (e.g. email, telephone, shared medical records) | 100 | 4.7 (0.49) | 100 | 4.8 (0.50) | 72.4 |

**Table 2** (continued)

| | | | | | |
|---|---|---|---|---|---|
| Element 16 | Between people affected by cancer, referrers, and service providers, care is coordinated and integrated to develop and implement dietary and exercise referral pathways | 100 | 4.7 (0.49) | No changes | 74.1 |
| Element 20 | People affected by cancer can access various modes of dietary and exercise service delivery (e.g., using telehealth) based on their individual needs and preferences | 98.2 | 4.7 (0.64) | No changes | 74.1 |
| Element 19 | People affected by cancer have routine evaluations of their dietary and exercise plans to improve quality of care | 96.2 | 4.5 (0.86) | No changes | 69.0 |
| Element 18 | People affected by cancer have dietary and exercise care plans, assessments, and updates on progress and outcomes which service providers feedback to referrers | 92.6 | 4.3 (0.94) | No changes | 74.1 |

Principle 5: Data-driven improvements and investment in research

*Outcome*

National collection and reporting of key cancer data, including consumer experience and outcome data, provides an indicator for high-quality care, influences health service improvements, and informs investment in research. Published research in cancer survivorship enriches the evidence base and informs improvements to enhance the care and outcomes of people affected by cancer

| Essential elements | | R2 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R3 consensus (≥ 75% rated a score ≥ 3) | Mean (SD) (5-point Likert scale) | R4 agreement (% agreement of consumers) |
|---|---|---|---|---|---|---|
| Element 22 | Dietary and exercise referrals can be optimised by translating research into practice, innovation, and improvements in cancer care | 100 | 4.9 (0.54) | No changes | | 94.7 |
| Element 23 | Research for dietary and exercise referral pathways should be continually invested in, and strengthened, to optimise outcomes for people affected by cancer | New element | | 100 | 4.6 (0.65) | 94.7 |

**Table 2** (continued)

| | | | | | |
|---|---|---|---|---|---|
| Element 21 | Dietary and exercise referrals can be optimised by collecting and evaluating quality data on the referral process and care outcomes using validated instruments and standardised protocols, where appropriate | 98.2 | 4.5 (0.75) | No changes | 84.2 |
| Element 24 | Investment in research for dietary and exercise referral practices should be produced in partnership with public and private sectors, organisations representing people affected by cancer, and consumers together with governing bodies and industry | New element | | 97.2 | 4.5 (0.84) 93.1 |

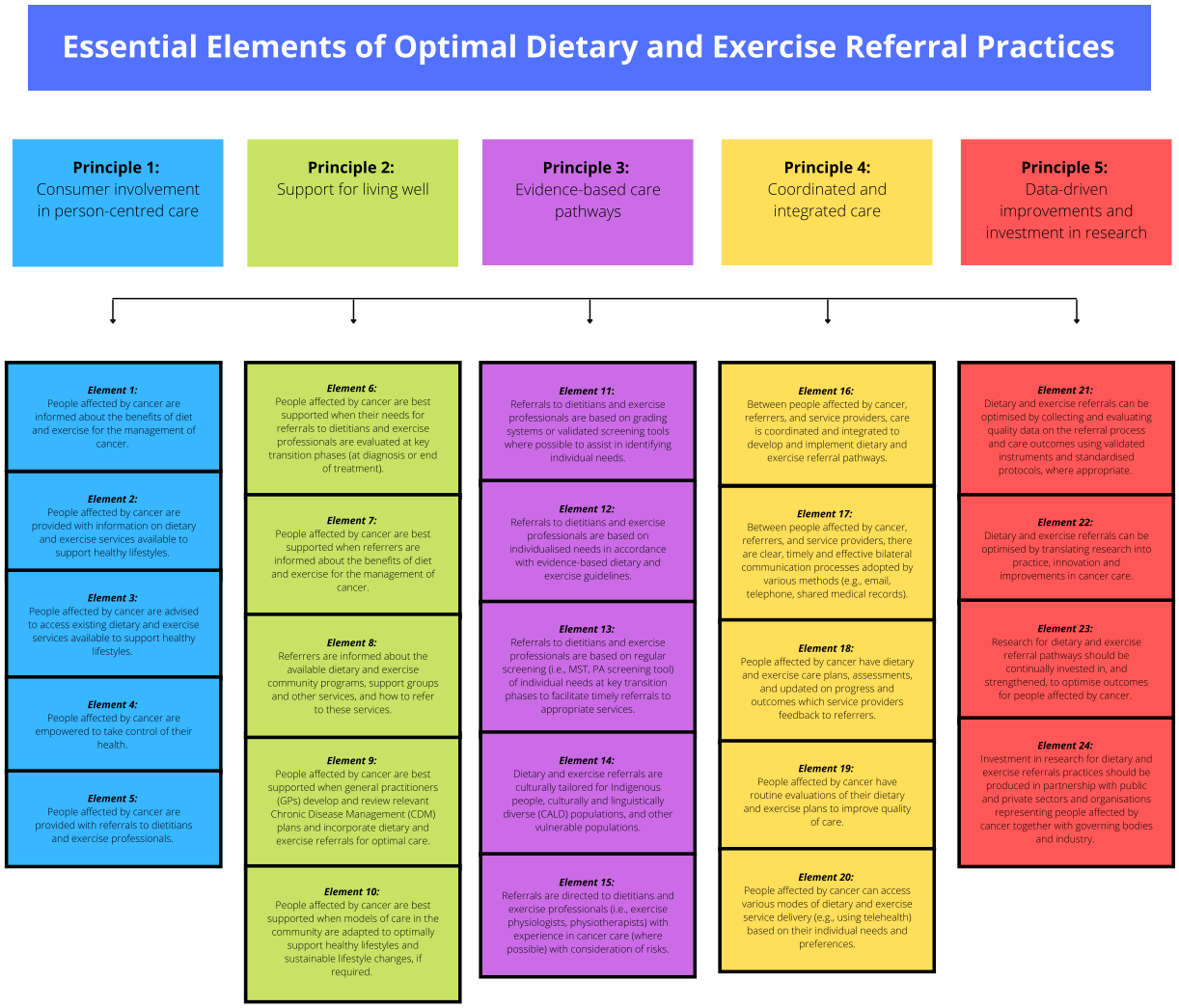
highest levels of agreement (90% or more) included statements relating to education on diet and exercise, evaluation of needs for referrals at key transition phases, translation of research into practice, and investments in research (Table 2).

## Discussion

This consensus study is the first to investigate the perspectives of local representatives from diverse clinical and educational backgrounds, including consumers, regarding the optimisation of dietary and exercise support and referral practices for cancer survivors. The Delphi method enabled panel members to achieve consensus on 24 essential elements of optimal dietary and exercise referral practices (Fig. 2). These essential elements provide a foundation for medical and nursing health professionals to promote consistent dietary and exercise support and referral practices for cancer survivors in order to help optimise quality survivorship care.

Key areas of consensus (mean rating of 4.8 or higher) revolved around the importance of informing cancer survivors and referrers about the benefits of diet and exercise for the management of cancer; the use of clear, timely, and effective bilateral communication processes between cancer survivors, referrers, and service providers; and evaluating cancer survivors' needs for referrals to dietitians and exercise professionals at key transition phases (Table 2). Despite the high levels of agreement among panel members in rounds 2 to 3 (ranking importance; ranging from 92.6 to 100%; mean 99.0% importance), levels of agreement were lower for consumers (ranking acceptability; ranging from 65.5 to 94.8%; mean 80.4% acceptance) in round 4. However, health professionals and consumers may have different expectations, experiences, and therefore opinions of what constitutes optimal dietary and exercise care due to differences in education, health literacy, or knowledge of care needs. Varying levels of acceptability with consumers for some statements could also relate to, or be influenced by, their personal experiences of cancer care, exemplified by a recent US national survey of cancer survivors ($n=2419$), where few participants reported receiving referrals to dietitians (25%), exercise programs (14.7%), or weight management programs (4.5%)[3].

Panel members recommended the addition of two new essential elements regarding education on the benefits of diet and exercise for cancer survivors and referrers. In order for cancer survivors to feel empowered to take action and seek access to dietary and exercise services and referrals (e.g., Chronic Disease Management Plan through their GP to facilitate five Medicare-rebated consultations by dietitians or exercise professionals each year), it is imperative that cancer survivors are aware about the benefits of diet and exercise in the first place. Moreover, cancer survivors




Adapted from the Principles of Cancer Survivorship by Cancer Australia.

**Fig. 2** Summary chart of the essential elements of optimal dietary and exercise referral practices

who value diet and exercise may be more likely to engage with dietary and exercise services and engage in appropriate self-management strategies [37]. Many medical and nursing health professionals have established relationships with cancer survivors, so they are well placed to educate cancer survivors about the importance and benefits of diet and exercise as it relates to cancer treatment and cancer outcomes [21–23]. This could be achieved by utilising evidence-based dietary and exercise guidelines and appropriate resources [14–16]. However, medical and nursing health professionals may face various barriers to providing this education, due to their self-reported lack of role clarity, knowledge and confidence, awareness of guidelines/resources, and time constraints [20]. Overcoming these barriers may help facilitate better education for cancer survivors.

Evaluation of cancer survivors' needs for referrals at key transition phases was considered an important element by all panel members, including consumers. Although international clinical guidelines recommend all cancer survivors be regularly evaluated for nutritional risk and physical activity levels, there needs to be a greater emphasis on screening at key transition moments [14, 38]. As the clinical needs of cancer survivors will change as they move through the cancer continuum, timely detection of needs throughout the different stages of the cancer care trajectory is crucial and can be supported using screening and assessment. Individualised screening of cancer survivors can identify their need for dietary and exercise services, together with the provision of referrals to dietitians and exercise professionals. However, due to infrequent or lack of screening practices

across hospitals and health professionals, cancer survivors are likely to miss key referral opportunities for earlier assessment and support from a dietitian or exercise professional [39, 40]. For screening to become integrated into standard care, funding needs to be prioritised, appropriate models of care must be developed, and health services must all be standardised, and evidence-based.

## Strengths and limitations

There are several limitations to this study. The research method's predisposition to participant attrition across rounds is one limitation; however, Delphi panel sample size relies more on group dynamics rather than numbers, as larger cohorts may provide diminishing returns on result validity [33]. One of the strengths of this study was the wide representation of health professions across rounds; however, the results could be strengthened with more representation from medical practitioners. Another limitation is the possibility that consumers in round 3 rated their acceptability of essential elements based on their personal experiences, rather than what they thought were important for optimal dietary and exercise care for all cancer survivors, which may have led to lower acceptability for some essential elements. Nonetheless, this provided a good representation of unique points of view from consumers of diverse backgrounds. Lastly, the essential element statements were all worded as "diet and exercise" together; thus, we were unable to determine whether there may have been any different findings if the same statements were assessed separately for diet and exercise.

## Conclusion

In total, 24 essential elements for optimal dietary and exercise referral practices for cancer survivors were generated with consensus from a diverse stakeholder panel. Most panel members placed a strong emphasis on the importance of education for cancer survivors and referrers regarding the benefits of diet and exercise. They also highlighted the importance of effectively assessing and monitoring cancer survivors' needs for referrals to dietitians and exercise professionals and ensuring clear communication processes between cancer survivors and their healthcare providers. Accordingly, essential elements identified in this study can help provide guidance to medical and nursing health professionals to streamline referrals to dietitians and exercise professionals.

## Implications for practice and research

Since essential elements recognise the role that medical and nursing health professionals play in the provision of dietary and exercise care to cancer survivors, they can be considered a building block within the health system that promotes quality supportive cancer care among cancer survivors. Essential elements can provide medical and nursing health professionals with necessary information regarding the quality of care provision for cancer survivors and establish measures in which to evaluate the care provided. It can also be tailored to alternative methods of healthcare delivery, for example, consideration of different delivery modes (i.e., expanded use of telehealth) to cater to varying accessibility (i.e., rurality) and preferences of diet and exercise service providers. A logical step forward would be around implementation or evaluation of referral practices as informed by these principles. It is also important that studies examine the cascading effects of optimised referral practices, examining how referrals lead to subsequent care and outcomes for cancer survivors.

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**Data availability** The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

## Declarations

**Ethics approval** Provided by the Human Research Ethics Committee of Queensland University of Technology (ID: 2000000940).

**Consent to participate** Written informed consent was obtained from all individual participants included in the study.

**Consent for publication** Not applicable.

**Competing interests** The authors declare no competing interests.

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