Optimizing cancer care through e-health: status, potential, and adoption

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Chapter 2

E-health interventions for Dutch cancer care: a systematic review using the Triple Aim lens

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Abstract

Background

Globally, the burden of cancer on population health is growing. Recent trends such as increasing survival rates have resulted in a need to adapt cancer care to ensure a good care experience and manageable expenditures. eHealth is a promising way to increase the quality of cancer care and support patients and survivors.

Objective

The aim of this systematic review was 2-fold. First, we aimed to provide an overview of eHealth interventions and their characteristics for Dutch patients with and survivors of cancer. Second, we aimed to provide an overview of the empirical evidence regarding the impact of eHealth interventions in cancer care on population health, quality of care, and per capita costs (the Triple Aim domains).

Methods

The electronic databases Web of Science, PubMed, Cochrane, and Ovid PsycINFO were searched using 3 key search themes: eHealth interventions, cancer care, and the Netherlands. The identified interventions were classified according to predetermined criteria describing the intervention characteristics (e.g., type, function, and target population). Their impact was subsequently examined using the Triple Aim framework.

Results

A total of 38 interventions were identified. Most of these were web portals or web applications functioning to inform and self-manage and target psychosocial factors or problems. Few interventions have been tailored to age, disease severity, or gender. The results of this study indicate that eHealth interventions could positively affect sleep quality, fatigue, and physical activity of patients with and survivors of cancer. Inconclusive results were found regarding daily functioning and quality of life, psychological complaints, and psychological adjustment to the disease.

Conclusion

eHealth can improve outcomes in the Triple Aim domains, particularly in the population health and quality of care domains. Cancer-related pain and common symptoms of active treatment were not targeted in the included interventions and should receive more attention. Further research is needed to fully understand the impact of eHealth interventions in cancer care on participation, accessibility, and costs. The latter can be examined in economic evaluations by comparing eHealth interventions with care as usual.

Introduction

Background

Globally, population health is greatly affected by cancer. An estimated 19.3 million new cancer cases and almost 10 million cancer deaths occurred in 2020 [1]. The related healthcare expenditure amounted to €103 (US $110) billion in Europe in 2018, corresponding to 6.2% of the total health expenditures [2]. The global cancer incidence is estimated to double by 2035 [3]. Owing to better screening and treatment options, survival rates have increased. Hence, cancer is increasingly becoming a chronic disease. Therefore, it is essential to develop and implement interventions to promote the long-term health and well-being of patients and survivors and to support daily disease coping [4].

Increasing attention is being paid to the use of eHealth to improve cancer care and support patients with cancer and survivors in coping with their illness. The World Health Organization defines eHealth as "the use of information and communication technology in support of health and health-related fields" [5]. There are several definitions of cancer survivors. Here, we use the definition of the National Cancer Institute: "persons with cancer post-treatment until the end of life" [6]. Currently, various eHealth interventions are available for patients with cancer and survivors. These interventions show considerable variations in function, target population, and type of eHealth technology. For instance, interventions can provide patients with and survivors of cancer with information about the disease and its treatment [7, 8], support decision-making and self-management [9, 10], alleviate physical and emotional problems [11, 12], or provide peer social support [13, 14]. Furthermore, interventions target different groups of patients with, or survivors of cancer using various technologies and can be used as unguided self-help or with the support of healthcare professionals. Several studies have evaluated specific eHealth interventions in cancer care [15-20]. These studies considered a variety of outcomes, such as psychological complaints [15, 16], symptom distress [17, 19], and insomnia severity [18], and examined the effect of intervention characteristics, such as the amount of support, on intervention efficacy [21].

Currently, a general overview of eHealth interventions in cancer care and their characteristics is lacking. Such an overview would provide insights into the broad range of eHealth interventions available in cancer care, making it easier to compare interventions and their efficacy. In addition, no reviews that investigate the empirical evidence of the impact of eHealth interventions in cancer care are available. The absence of such overviews limits our understanding of the added value of eHealth interventions in cancer care. One way of evaluating interventions is through the Triple Aim framework. This model focuses on (1) improving population health, (2) improving the quality of care and patient experience, and (3) reducing the per capita healthcare costs [22]. Many areas of health reform can be helped forward and strengthened by the Triple Aim

framework, including the integration of information technologies such as eHealth. Deploying the Triple Aim lens offers an opportunity for a holistic and versatile evaluation.

Objective

The aim of this systematic review is 2-fold: (1) to provide an overview of available eHealth interventions in cancer care and their characteristics as described in the scientific literature and (2) to provide an overview of the empirical evidence regarding the impact of eHealth interventions in cancer care on population health, quality of care, and per capita costs - the Triple Aim domains [23]. As eHealth interventions are likely to be context-specific or even context-dependent, we will examine eHealth interventions applied in the Dutch context [24]. The Dutch context has been chosen as a case study and serves as an example for other Western countries.

Methods

Search Strategy

The following 4 databases were searched electronically from the earliest available date to June 14, 2021, to identify relevant literature: Web of Science, PubMed, Cochrane, and Ovid PsycINFO. Three key search components were used: eHealth interventions, cancer, and the Netherlands. An overview of the search strategies for each database can be found in Multimedia Appendix 1. Other potentially relevant publications were identified by tracking the reference lists of included articles.

Eligibility Criteria

Studies were eligible if the following criteria were met:

- Population: the eHealth intervention was offered in the Netherlands and targeted adults (>18 years) diagnosed with cancer who were about to start, are currently undergoing, or have finished treatment (i.e., cancer survivors) within the Dutch healthcare system.
- Intervention: the study focused on eHealth interventions according to the definition of eHealth by the World Health Organization [5]: "the use of information and communication technology in support of health and health-related fields." Both fully web-based and blended eHealth interventions (i.e., interventions combining web-based components with face-to-face contact) were included [25]. The eHealth intervention did not consist of business intelligence and big data solutions, such as analyzing structured and unstructured data to gather information to support decision-making [26].
- Comparison: studies were included independently of the presence and type of control group.
- Outcome: there was no focus on specific research outcomes for the first aim - to provide

an overview of available eHealth interventions. The goal was to obtain a broad picture of available eHealth interventions. For the second aim - to provide an overview of empirical evidence regarding the impact of eHealth interventions - only studies that measured one or more of the Triple Aim domains were included.

- Setting: using any study designs except for incomplete trials, editorials, letters, and reviews. Nonetheless, the latter method was used to identify additional relevant studies from the reference lists. We excluded these 3 study designs as they were non–peer-reviewed or did not discuss a specific intervention.
- Time: all years were included as long as the study was published in the Dutch or English language.

Selection Procedure

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Statement was used to ensure the validity and reliability of the selection procedure [27]. The PRISMA 2020 checklist can be found in Multimedia Appendix 2 [139]. One investigator (LvD) searched for eligible studies. Subsequently, the reference software program Endnote (Endnote X7; Thomson Reuters) was used to remove duplicates. Two investigators (LvD and LS) independently screened the titles and abstracts of the articles to identify relevant studies. Next, full texts of the potentially relevant articles were assessed. Discrepancies between investigators were mutually resolved through discussion until a consensus was reached. Web-based software Covidence (Veritas Health Innovation) [28] was used for the screening process.

Data Selection and Extraction

The following intervention characteristics were extracted at the application level (Multimedia Appendix 3):

- Summary of the intervention: a short description of the intervention type (e.g., web-based training modules) and purpose.
- Functional category: the classification was based on CEN (Comité Européen de Normalisation)-ISO (International Organization for Standardization) DTS (Draft Technical Specification) 82304-2:2020 [29] - a document providing quality requirements for health applications. The following categories were distinguished: (1) inform; (2) simple monitoring, to allow users to record health parameters to create health diaries; (3) communicate, to allow 2-way communication; (4) preventive behavior change, to change intended user behavior, such as related to smoking or sexual health; (5) self-management, to help persons with specific health issues to manage their health; (6) treat, to provide treatment for specific health issues or to guide treatment decisions; (7) active monitoring, to automatically record information for remote monitoring; and (8) diagnose, to use data to diagnose health issues.
- Type of eHealth: the classification of the type of eHealth of the intervention was based on

the categorization of Nictiz [26], a Dutch knowledge center for national applications of information and communications technology in healthcare [30]: (1) web application or web portal (offered via a web browser, place, and time-independent), (2) mobile app (available on a smartphone), (3) health sensor (to measure vital bodily functions) or health gateway (to collect and transmit data from health sensors to medical professionals) or wearable devices (health sensors carried on the body), (4) electronic health records or personal health records, and (5) video communication tools.
- Intended setting to use the intervention: primary care, secondary care, or community.
- Target population: type of cancer, demographics (gender, age, and nationality), and specific characteristics (e.g., smokers).
- Support of health care professional: yes or no, with an explanation.
- Use of theory in the development of the intervention: yes or no, with an explanation.
- Stakeholder involvement in the development of the intervention: yes or no, with an explanation.

Information on research methods and outcomes was extracted at the study level for each empirical evaluation study. More specifically, we extracted information on the study design and objective, the number of participants included at baseline, description of the control group (if applicable), data collection period, study measures, and outcomes. Study outcomes were classified using the Triple Aim [23]. The Triple Aim describes an approach to improve health system performance by focusing on the following:

- Improving the health of populations.
- Improving patient experience (including quality, patient-centeredness, safety, and timeliness of care).
- Reducing the per capita cost of health care [23].

We used the framework by Struijs et al [31, 32], who elaborated on this model by breaking down the 3 aims into more concrete dimensions (Textbox 1).

Textbox 1. Overview of levels in Triple Aim based framework by Struijs et al [31, 32]

Population health:

- Health outcomes
- Disease burden
- Behavioral and physiological factors
- Participation
- Functioning and quality of life

Quality of care:

- Patient safety
- Effectivity
- Responsiveness
- Timeliness
- Support
- Accessibility

Per capita costs:

- Costs of care
- Volume
- Organizational costs
- Productivity loss

Furthermore, a quality appraisal was conducted for each empirical evaluation study using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies [33]. This tool has been reported to have construct and content validity [34, 35]. Furthermore, the tool can be used to gain insight into the quality of different study designs, making it easier to compare the results of the quality appraisal in this review. This tool assesses 6 components: (1) selection bias, (2) study design, (3) confounders, (4) blinding, (5) data collection methods, and (6) withdrawals and dropouts. Each component can be rated as strong, moderate, or weak based on the guidelines for the tool. Based on the ratings of each component, the tool allocates an overall methodological score for the study: strong, moderate, or weak.
Finally, an overview of funding sources per article can be found in Multimedia Appendix 4.

Customized data extraction sheets were developed for the intervention characteristics and the study design, quality appraisal, and study outcomes. To ensure consistency in data extraction, one researcher (LvD) independently subtracted the data of each study and a second researcher (LS) subtracted data of a random sample of 15% of these studies. The interrater agreement was 83.5%, which was considered good. Data were narratively synthesized in 2 sections. The

first section discusses the intervention characteristics of the identified interventions. The second section discusses the study design, quality appraisal, and empirical study outcomes.

Results

Study Selection and Characteristics

Figure 1 shows the flow diagram of the study selection. We identified 577 articles, and reference tracking yielded an additional 31 peer-reviewed studies. Removal of duplicates resulted in 364 publications. After screening the records and assessing the full-text articles, 85 articles were included in this review. Multimedia Appendix 5 lists excluded studies in the full-text screening stage.

The resulting 85 included articles described 38 unique interventions. An empirical evaluation of eHealth interventions in cancer care was performed in 26 of these 85 articles. These 26 evaluation studies evaluated 18 of the 38 identified eHealth interventions, as in some cases, multiple articles evaluated the same intervention.

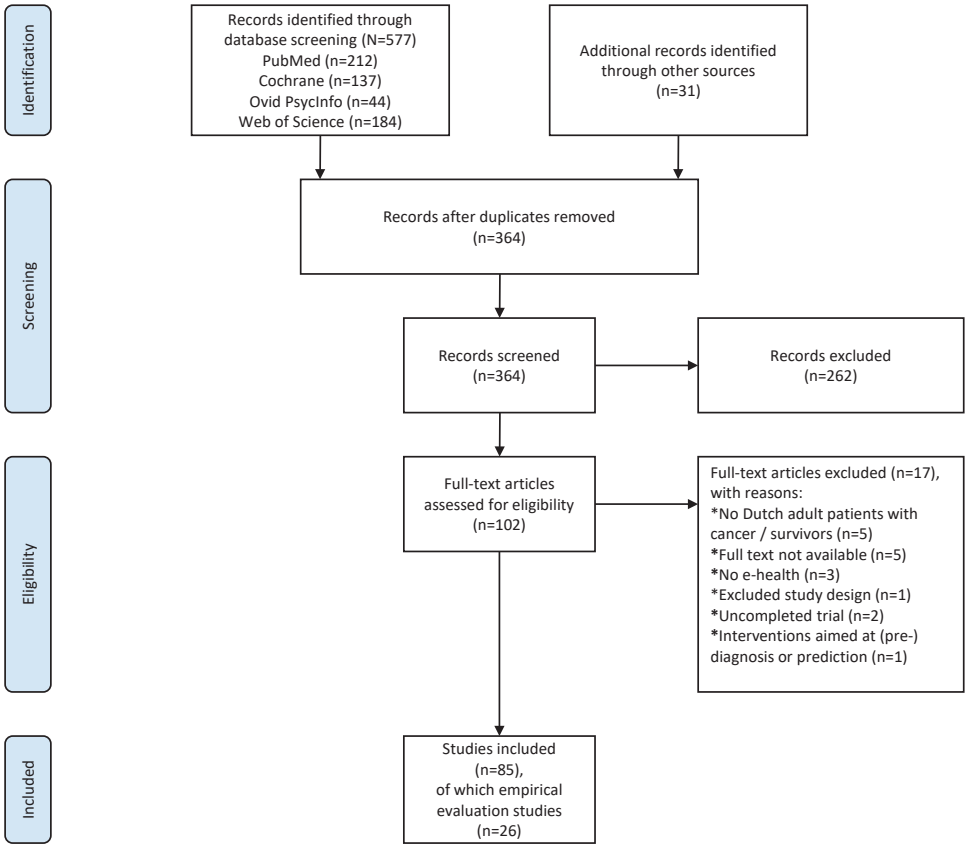

Figure 1. Study selection flow diagram according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 [27]

The main characteristics of the interventions are described in the subsequent section to provide an overview of available eHealth interventions in cancer care and their characteristics as described in the scientific literature (the first study aim). The described intervention characteristics are purpose, functional category, type of eHealth, setting, target population, support of health care professionals, and the use of theory.

Intervention Purpose

The included interventions had a broad range of purposes, such as supporting decision-making (e.g., decision aids), communicating with health care professionals, monitoring patient-reported outcomes, and participating in online support communities. Almost half of the interventions targeted psychosocial factors (e.g., cognitive, or sexual functioning and psychological adjustment) or problems (e.g., smoking, drinking behavior, depression, and anxiety). Approximately two-thirds

of these psychosocial interventions aimed to reduce general psychosocial issues or psychological complaints or foster patients' self-efficacy or disease coping.

Functional Category, Type of eHealth Intervention, and Setting

The interventions had various functions, in some cases, more than one. The most common functions were inform (n=35), self-manage (n=14), treat (n=11), and preventive behavior change (n=7). Most interventions were web applications or web portals (n=34) or mobile apps (n=7). Most of the interventions were used in secondary care (n=32).

Target Population

Approximately half (17/38, 45%) of the interventions targeted the general population of patients with cancer or survivors, whereas others targeted a specific type (15/38, 39%) or multiple types (6/38, 16%) of cancer. A total of 14 interventions were aimed at patients or survivors with specific demographics, namely age (e.g., young adults or older adult patients; 4/38, 10%), origin (Turkish-Dutch or Moroccan Dutch migrants; 1/38, 3%), or gender (9/38, 24%). The latter interventions were often specifically designed for female patients with or survivors of breast cancer (8/38, 21%). A total of 8 interventions targeted patients or survivors with specific clinical characteristics (e.g., smokers and patients with depressive symptoms). Finally, 3 interventions focused on patients with a specific disease severity: stable lower-grade glioma (1/3, 33%) and patients treated with palliative intent (2/3, 67%).

Support of Healthcare Professionals and Use of Theory

Support from a healthcare professional was possible in 55% (21/38) of the interventions. Support comprised, among others, web-based support from a coach [36, 37], weekly feedback from a healthcare provider [38-40], and teleconsultation with a healthcare provider [41, 42]. Approximately 60% (23/38) of the interventions were theory-based, using, for example, principles from cognitive behavioral theory and the theory of planned behavior.

More details on the intervention characteristics can be found in Multimedia Appendix 3.

Characteristics of the empirical studies and the study results are described in the subsequent sections to provide an overview of the empirical evidence regarding the impact of eHealth interventions in cancer care on population health, quality of care, and per capita costs, the Triple Aim domains (the second study aim).

Description of Empirical Studies

General Characteristics

Table 1 shows the characteristics of the 26 available studies that evaluated 18 different interventions for Dutch patients with or survivors of cancer. Approximately 88% (23/26) of the studies were randomized controlled trials, 8% (2/26) were prospective controlled trials, and 4% (1/26) were a before-and-after design. The control condition involved either usual care (9/26, 35%), being placed on a waiting list to participate after the research period ended (2/26, 8%), a combination of usual care and being placed on a waiting list (9/26, 35%), or receiving another intervention (5/26, 19%). In one study, no control group was used (1/26, 4%). Most studies used 1 (4/26, 15%), 2 (7/26, 27%), or 3 (12/26, 46%) follow-up measurements. One study had 4 follow-up measurements (1/26, 4%) and one did not have follow up measurements (1/26, 4%). The measurement period ranged from 1 week to 1 year after baseline measurement. The average number of patients who participated in the study was 250 (*SD* = 181; range 34 – 625).

Quality Appraisal

A moderate global rating for the quality of evidence was assigned to 16 studies. Six studies were assigned a weak global rating and 4 received a strong global rating. Selection bias was likely present in most studies (18/26, 69%). Most studies were considered to have a low risk of bias concerning the study design, confounders, and data collection. Moderate risk was identified for the majority of studies on the blinding component. Scores for the component withdrawals and dropouts varied considerably. Details can be found in Multimedia Appendix 6.

Table 1. Characteristics of the empirical evaluation studies

Intervention	Study design	Participants	Study aim	Description of the control group	Data collection period
Cancer aftercare guide (Kanker Nazorg Wijzer [KNW])					
Study 1 [43]	RCT[a]	Total (N=462), IC[b] (n=231), control group (CG) (n=231)	Present short-term effects of the Cancer Aftercare Guide (KNW) on QoL[c], anxiety, depression, and fatigue	Usual care and a waiting list	BM[d], follow-up at 3 months, 6 months, and 1 year
Study 2 [44]	RCT	Total (N=462), IC (n=231), CG (n=231)	Explore the influence of gender, age, educational level, and treatment type on intervention effectiveness	Usual care and a waiting list	BM, follow-up at 3 months, 6 months, and 1 year
Study 3 [45]	RCT	Total (N=462), IC (n=231), CG (n=231)	Assess the short-term effects of the KNW on lifestyle outcomes	Usual care and a waiting list	BM, follow-up at 3 months, 6 months, and 1 year
Study 4 [46]	RCT	Total (N=462), IC (n=231), CG (n=231)	Examine the long-term effects of the KNW on moderate physical activity and vegetable consumption	Usual care and a waiting list	BM, follow-up at 3 months, 6 months, and 1 year
OncoCompass (OncoKompas)					
Study 1 [47]	RCT	Total (N=625), IC (n=320), CG (n=305)	Evaluate the efficacy of OncoKompas to improve knowledge, skills, and confidence for self-management among survivors of different cancer types	Usual care and a waiting list	BM, follow-up post intervention, and at 3 months and 6 months
Study 2 [48]	RCT and economic evaluation	Total (N=625), IC (n=320), CG (n=305)	Evaluate the cost-utility of Oncokompas compared with usual care among cancer survivors	Usual care and a waiting list	BM, post intervention, and 3 months and 6 months follow-up
Transmural Oncological Support (TOS)					
Study 1 [49]	PCT[e]	Total (N=36)	Determine the use, appreciation, and effectiveness of an eHealth information support system in head and neck cancer care	N/A[f]	BM, follow-up at 6 weeks

Intervention	Study design	Participants	Study aim	Description of the control group	Data collection period
Study 2 [50]	PCT	Total (N=184), IC (n=145), CG (n=39)	Investigate whether telemedicine could be beneficial to the quality of life of patients with cancer	Usual care	BM, follow-up at 6 weeks and 3 months
Everything under control (Alles onder controle) [37]	RCT	Total (N=115), glioma intervention group (n=45), glioma waiting list control group (GWL; n=44), non–central nervous system (CNS) cancer control group (n=26)	Evaluate the effects of the intervention on depressive symptoms in adult patients with glioma	GWL patients: a waiting list. Non-CNS cancer control group patients: regular intervention	BM, follow-up at 6 and 12 weeks, 6 months, and 12 months
Prostate cancer decision aid (Prostaatkanker keuzehulp) [51]	RCT	Total (N=336), IC (n=235), CG (n=101)	Compare patients' evaluation of treatment decision-making process in localized prostate cancer between counseling including an online decision aid (DA) and standard counseling	Usual care	BM, follow-up 1 week after the indicated date of the next consultation
Less tired (Minder Moe) [38]	RCT	Total (N=167), IC 1 (ambulant activity feedback [AAF]; n=62), IC 2 (Minder Moe; n=55), CG (psychoeducation; n=50)	Report on the clinical effectiveness of AAF and eMBCT in reducing fatigue severity and improving mental health in severely fatigued cancer survivors, compared with psychoeducation	Other intervention: psycho-educational mails	BM, follow-up at 2 weeks, 3 months, 6 months, and 12 months
Less tired for anxiety and depression complaints [52]	RCT	Total (N=245), IC 1 (mindfulness based cognitive therapy [MBCT]; n=77), IC 2 (eMBCT; n=90), CG (treatment as usual [TAU]); n=78)	Compare MBCT and eMBCT with treatment as usual for psychological distress in patients with cancer	Usual care	BM, posttreatment, 3 months, and 9 months posttreatment

Intervention	Study design	Participants	Study aim	Description of the control group	Data collection period
BREATH [53]	RCT	Total (N=150), IC (n=70), CG (n=80)	Study whether care as usual plus BREATH[g] can effectively target negative and positive adjustment	Usual care	BM, follow-up at 4, 6, and 10 months
Less fear after cancer (Minder angst bij kanker) [54]	RCT	Total (N=262), IC (n=130), CG (n=132)	Evaluate the cost-effectiveness of a web-based CBT[h]-based self-help training in reducing fear of cancer recurrence (FCR) in women with curatively treated BC	Usual care	BM, follow-up at 3 months and 9 months
OncoActive [55]	RCT	Total (N=478), IC (n=249), CG (n=229)	Gain insight into the efficacy of the intervention to increase PA	Usual care and a waiting list	BM, follow-up at 3 and 6 months
PatientTIME [56]	RCT	Total (N=97), IC (n=63), CG (n=34)	Evaluate if and in what way patients benefit from PatientTIME and if it enhances their confidence in clinical communication	A waiting list	BM, follow-up at T1 (exact timing unclear) and 3 months after participation
ENCOURAGE [57]	RCT	Total (N=138), IC (n=70), CG (n=69)	Examine the effectiveness of the intervention to empower BC patients to take control over prevailing problems	Usual care	BM, follow-up at 6 and 12 weeks
Cancer, intimacy, and sexuality (kanker, intimiteit en seksualiteit)					
Study 1 [58]	RCT	Total (N=169); IC (n=84), CG (n=85)	Evaluate the effect of the intervention on sexual functioning and relationship intimacy in BC survivors with sexual dysfunction	Other intervention: receive an information booklet on sexuality issues after BC treatment	BM, follow-up at 10 weeks after the start of therapy and post therapy, at 3 and 9 months
Study 2 [59]	RCT	Total (N=169). Only the IC group is taken into account in this study: n=84	Evaluate the long-term efficacy of the intervention for sexual dysfunctions in BC survivors	Other intervention: receive an information booklet on sexuality issues after BC treatment	BM, follow-up at 10 weeks after the start of therapy and post therapy, at 3 and 9 months

Intervention	Study design	Participants	Study aim	Description of the control group	Data collection period
Home monitoring tool for adequate pain treatment [60]	Before-and-after design	Total (N=108), IC (n=54), CG (n=54)	Assess whether home telemonitoring increased registration of pain in medical records of patients visiting a Dutch teaching hospital	Usual care	The authors analyzed medical records from the first 3 visits (a total of 162 visits)
EvaOnline					
Study 1 [21]	RCT	Total (N=254), IC 1 (n=85), IC 2 (n=85), CG (n=84)	Evaluate the efficacy of an iCBT program in women with BC treatment-induced menopausal symptoms	Usual care and a waiting list	BM, follow-up at 10 weeks and 24 weeks
Study 2 [61]	RCT and economic evaluation	Total (N=254), IC 1 (n=85), IC 2 (n=85), CG (n=84)	Evaluate the cost-utility, cost-effectiveness, and budget impact of both iCBT formats compared with a waiting list control group	Usual care and a waiting list	BM, follow-up at 10 weeks and 24 weeks
Home-based exercise intervention					
Study 1 [62]	RCT	Total (N=34), IC (n=23), CG (n=11)	Present a detailed evaluation of the intervention regarding accrual, attrition, adherence, safety, and patient satisfaction	Other intervention: 2 brochures with lifestyle advise	BM, follow-up at 6 months
Study 2 [63]	RCT	Total (N=34), IC (n=23), CG (n=11)	Explore the possible impact of an exercise intervention on cognitive test performance and patient-reported outcomes in patients with glioma	Other intervention: 2 brochures with lifestyle advice	BM, follow-up at 6 months
My-GMC [64]	RCT	Total (N=109), IC (n=59), CG (n=50)	Evaluate the efficacy of the intervention	Usual care	BM, follow-up at 1 week, 3 months, and 6 months
Teleconsultation for patients receiving palliative home care [42]	RCT	Total (N=74), IC (n=38), CG (n=36)	Determine whether weekly teleconsultations improved patient-experienced symptom burden compared with "care as usual"	Usual care	BM, at 4 weeks, 8 weeks, and 12 weeks

[a]RCT: randomized controlled trial. [b]IC: intervention condition. [c]QoL: quality of life. [d]BM: baseline measurement. [e]PCT: prospective clinical trial. [f]N/A: not applicable. [g]BREATH: breast cancer eHealth. [h]CBT: cognitive behavioral therapy.

Study Outcomes

Most studies measured at least one dimension within either the population health or quality of care domain (23 and 24 studies, respectively).

Three studies measured at least one dimension within the per capita costs domain (Table 2 and Multimedia Appendix 7). An overview of the domains and dimensions measured per study can be found in Multimedia Appendix 8. The outcomes are described by dimension in subsequent sections. Unless stated otherwise, significant between-group differences were described by comparing the intervention and control groups.

Table 2. Overview of the found effects per empirical evaluation study

Intervention	Results[a]
Randomized Controlled Trial studies	
Cancer aftercare guide (Kanker Nazorg Wijzer)	
Study 1 [43]	e: After 6 months: Emotional functioning *sig**[b]. Social functioning *sig;** MT[c] *sig.* g: After 6 months: Depression *sig***; MT *sig;* ITT *sig**. Fatigue *sig**; MT *sig;* ITT[d] *sig**. h: Participants in the IC who completed the 6-month measurement on average used 2.2 modules. Loss to follow-up in the IC was 16.2%.
Study 2 [44]	e: After 12 months: Emotional functioning *n.s.* Social functioning *n.s.* g: After 12 months: Depression *n.s.* Fatigue *n.s.* h: Overall appreciation of the KNW is 7.48 (10-point scale).
Study 3 [45]	c: After 6 months: Moderate PA *sig;** MT *n.s.* vegetable consumption *sig;** MT *n.s.* other PA outcomes *n.s.;* MT *n.s.* other dietary outcomes *n.s.* smoking behavior *n.s.* h: Loss to follow-up after 6 months was low (11.5%) vs mean percentage of dropouts (19.7%) of web-based trials for cancer survivors.
Study 4 [46]	c: After 12 months: moderate physical activity *sig***. Vegetable consumption *n.s.* h: Loss to follow-up in the IC was 45.5%.
OncoCompass (OncoKompas)	
Study 1 [47]	b: The course of symptoms in head and neck cancer survivors, colorectal cancer survivors and high-grade non-Hodgkin lymphoma survivors *sig**. The course of symptoms in BC survivors *n.s.* e: HRQoL *sig**. g: Course of mental adjustment to cancer *n.s.* h: Course of supportive care needs *n.s.* Patient-physician interaction over time *n.s.* Self-efficacy *n.s.* Personal control *n.s.* Patient activation *n.s.* In the IC, 78% activated their account and 52% used the intervention as intended.
Study 2 [48]	h: The loss to follow up in the IC was 36%. l: OncoCompass is likely to be equally effective on utilities and not more expensive than usual care.

Intervention	Results[a]
Everything under control (Alles onder controle) [37]	e: Physical health after 12 months ITT and protocol analysis n.s. g: After 6 weeks: Depression (GI vs GWL group and Total glioma group vs non-CNS cancer group) *n.s.* Fatigue (GI vs GWL group) *sig**. After 12 weeks: depression *n.s.* Fatigue *n.s.* Other measures (GI vs GWL group) *n.s.* h: Most patients said they had benefitted from participating (73% glioma; 67% non-CNS), and the program was useful (92% in both groups) and informative (86% glioma; 92% non-CNS). The participation rate was 40%. The adherence of the IC was 85% for the introduction and 77%, 52%, 40%, 37%, and 35% for modules 1 through 5, respectively.
Prostate cancer decision aid (Prostaatkanker keuzehulp) [51]	h: Satisfaction with information *sig**. Involvement *n.s.* Decisional conflict *n.s.* Knowledge scores *n.s.* Subjective knowledge *sig***. Objective knowledge *n.s.*
Less tired (Minder Moe) [38]	g: Fatigue severity *sig**. Psychic complaints *n.s.* Positive and negative affect *n.s.* h: The proportion of participants who dropped out before completing 6 weeks of the protocol was 18% in the AAF condition, 38% in the eMBCT, and 6% in the psychoeducation condition.
Less tired for anxiety and depression complaints [52]	b: Psychiatric diagnosis *n.s.* c: Mindfulness skills *sig**. e: Mental HRQoL *sig**. Positive mental health *sig**. Physical HRQoL *n.s.* g: Psychological distress *sig***. Fear of cancer recurrence *sig**. Rumination *sig**. h: 90.9% started MBCT and 92.2% completed ≥4 sessions. 91.1% started eMBCT and 71 completed ≥4 sessions. The dropout rate was higher in eMBCT than in the MBCT.
BREATH [53]	g: At T1: Distress *sig**. 5 out of 7 negative adjustment variables (general and cancer-specific distress, fatigue, and 2 fear of cancer recurrence outcomes) and 3 out of 10 positive adjustment variables (self-efficacy, remoralization, new ways of living) *sig**. Clinically significant improvement *sig**. At T2 and T3: Distress *n.s.* One negative adjustment variable (Fear of cancer recurrence) *sig**. One positive adjustment outcome (Acceptance) *sig***. All other outcomes *n.s.* h: At T1: Empowerment *n.s.* The frequency of logins ranged from 0 to 45. Total duration ranged from 0 to 2.324 minutes.
Less fear after cancer (Minder angst bij kanker) [54]	g: Fear of cancer recurrence *n.s.* h: The dropout rate in the IC was 30%.
OncoActive [55]	c: At 3 months: PA *sig;** ITT *sig.* e: At 3 months: Physical functioning *sig;*** ITT *sig.* HRQoL *n.s.* At 6 months follow-up: physical functioning *sig;** ITT *n.s.* HRQoL *n.s.* g: At 3 months follow-up: Fatigue *sig**. At 6 months follow-up: Fatigue *sig***. Depression *sig,*** ITT *sig.* Anxiety *n.s.* h: Dropout rates were 4.4% at 3-month follow-up and 7.3% at 6-month follow-up.

Intervention	Results[a]
PatientTIME [56]	h: System usability scale: 73 points (100-point scale), considered "good." At T1 and T2: PEPPI score *n.s.* The participation rate was 90%.
ENCOURAGE [57]	e: At T2: QoL *n.s.* g: At T1: Increased acceptance *n.s.* Other primary outcomes *n.s.* At T2: All outcomes *n.s.* h: Usefulness score of the program 3.75 (5-point scale). At T1: Being better-informed *sig**. At T2*: n.s.* 61% of the patients logged in more than once.
Cancer, intimacy, and sexuality (Kanker, intimiteit en seksualiteit)	
Study 1 [58]	e: At T1: Sexual desire *sig***. Sexual pleasure *sig***. Discomfort during sex *sig***. Orgasmic function *n.s.* Sexual satisfaction *n.s.* Sex frequency *n.s.* Relationship intimacy *n.s.* Marital functioning *n.s.* Health-related quality of life *n.s.* At T2: Overall sexual functioning *sig**. Sexual desire *sig***. Sexual arousal *sig***. Vaginal lubrication *sig**. Sexual pleasure. Discomfort during sex *sig***. Orgasmic function *n.s.* Sexual satisfaction *n.s.* Sex frequency *n.s.* Relationship intimacy *n.s.* Marital functioning *n.s.* Health-related quality of life *n.s.* g: At T1: Menopausal symptoms *sig***. Body image *sig***. Psychological distress *n.s.* At T2: Menopausal symptoms *n.s.* Body image *sig***. Psychological distress *n.s.* h: The CBT was completed by 61.9% of women.
Study 2 [59]	a: *Only time effect was taken into account as T3 and T4 assessments were completed only by the IC.* At T3 and T4: general health *positive effect was maintained.* e: At T3 and T4: Sexual functioning, sexual desire, vaginal lubrication, sexual satisfaction, discomfort during sex, sexual distress, marital sexual satisfaction *positive effect maintained.* Sex frequency, intellectual intimacy, and sexual pleasure *decreased over time*. Marital satisfaction and other health-related quality of life domains *n.s. time effect.* g: At T3 and T4: Menopausal symptoms and body image *positive effect maintained,* quadratic effect *n.s. time effect.* Distress *n.s. time effect.* h: The CBT was completed by 61.9% of women.
EvaOnline	
Study 1 [21]	e: Sexual functioning *n.s.* HRQoL *n.s.* g: At T1: Both IC groups' (guided and self-managed) perceived impact of HF and NS *sig***. Guided group overall levels of menopausal symptoms *sig***. Both IC groups sleep quality *sig***. Guided hot flush frequency *sig.* Guided group night sweats frequency *sig***. Psychological distress *n.s.* *h:* Minimum compliance rate was 90.6% for the guided and 78.8% for the self-managed IC's.
Study 2 [61]	l: The guided and self-managed iCBT are cost-effective. Self-managed iCBT is the most cost-effective strategy.
Home-based exercise intervention	

Intervention	Results[a]
Study 1 [62]	c: Self-reported physical activity at 6 months *sig**. BMI at 6 months *n.s.* Mean absolute VO_2 peak at 6 months *n.s.* Aerobic fitness at 6 months *sig.* h: 16 (84%) patients evaluated the physical exercise program as good or excellent, and 4 as moderately or sufficiently satisfactory. Mean adherence was 79%.
Study 2 [63]	e: For attention, 4 measures (attentional inhibition, attention span, auditory selective attention, and working memory) *sig.* Information processing speed *sig.* Sustained selective attention *n.s.* For memory, immediate verbal recall *sig.* Two measures of executive function (auditory working memory and alternating attention) *sig.* One of 2 measures of cognitive functioning *sig.* Mood *sig.* Mental health-related quality of life *sig.* Brain cancer-specific health-related quality of life scales *n.s.* h: Loss to follow-up in the IC was 8.7%. g: Two scales of fatigue (physical fatigue and reduced activity) *sig.* Sleep *sig.*
My-GMC [64]	c: Medication adherence at T2 *sig.* e: Quality of life at all time points *n.s.* g: Distress at all time points *n.s.* Cancer worry at all time points *n.s.* h: Satisfaction with the online app was rated 2.8 (5-point scale). Professional satisfaction with the video GMCs was 2.7 (5-point scale). Empowerment at all time points *n.s.* The participation rate was 35%.
Teleconsultation for patients receiving palliative home care [42]	b: Symptom burden *n.s.* g: Anxiety *n.s.* Depression *n.s.* All 3 subscales for continuity of care *n.s.* h: Study outcome measures regarding GP contacts and complex interventions *n.s.* Mean number of unmet needs *n.s.* The attrition rates were 61% in the IC and 53% in the CG. m: Mean number of hospital admissions *n.s.*
Prospective Controlled Trial studies	
Transmural oncological support	
Study 1 [49]	h: The average score of all patients for the monitoring function was 8.0 (10-point scale). The average score rated by 7 GPs of the electronic health information support system was 5.6 (10-point scale). The participation rate was 66%. All patients used the system.
Study 2 [50]	e: After the intervention: 5 of the 22 QoL subscales (state anxiety, fear related to specific head and neck problems, physical self-efficacy, perceived abilities in swallowing and food intake, and general physical complaints) *sig.* At 3 months: 1 subscale (physical self-efficacy) *sig**. Other subscales *n.s.* h: The participation rate in the IC was 66%, and 35 out of 39 patients completed all questionnaires.
Before-and-after design studies	
Home monitoring tool for adequate pain treatment [60]	g: Total number of "pain registrations" in the medical records *sig**.

[a]Triple Aim domains: a = Health outcomes, b = Disease burden, c = Behavioral and physiological factors, d = Participation, e = Functioning and quality of life, f = Patient safety, g = Effectivity, h = Responsiveness, i = Timeliness, j = Support, k = Accessibility, l = Costs of care m = Volume, n = Organizational costs, o = Productivity loss. [b]*sig* = significant positive

between-group difference in favor of IC, *P* value unknown; *sig** = significant positive between-group difference in favor of IC, α ≤ .05; *sig*** = significant positive between-group difference in favor of IC, α ≤ .01; *n.s.* = nonsignificant between-group difference in favor of IC. [c]*MT* = controlling for multiple testing or comparisons. [d]*ITT* = intention-to-treat analysis.

Population Health

A total of 23 studies measured at least one dimension within the *population health* domain, and 6 studies measured the dimension *behavioral and physiological factors* [45, 46, 52, 55, 62, 64]. Positive effects were found for aerobic fitness [62] and physical activity [45, 55, 62]; however, these effects did not always hold after controlling for multiple testing [45] or in follow-up studies [46]. There were also significant effects on mindfulness skills [52] and medication adherence [64]. No effects were found for smoking behavior [45, 46], physical fitness level [62], and changes in BMI [62]. A total of 13 studies measured the dimension *functioning and quality of life* [21, 37, 43, 44, 47, 50, 52, 55, 57-59, 63, 64]. Six studies focused on daily functioning. The studies showed positive effects for emotional and social functioning [43]; however, these effects were not significant at follow-up [44]. Furthermore, positive effects were found for physical functioning [55]; however, these effects were not significant after controlling for multiple testing [55]. One study demonstrated positive effects on cognitive functioning [63]. Mixed effects were found in terms of sexual functioning [21, 59]. Most studies measuring health-related quality of life did not find positive effects (4/6, 67%) [21, 47, 50, 55, 57, 64]. Positive effects were found for mental health-related quality of life [52, 63] but not for physical health [37, 52]. The dimensions *health outcomes* (*n*=1) [59] and *disease burden* (*n*=3) [42, 47, 52] were less prevalent, and the dimension *participation* was not studied at all.

Quality of Care

A total of 24 studies measured at least one dimension within the domain *quality of care*. Furthermore, 17 studies measured the dimension *effectivity* [21, 37, 38, 42-44, 47, 52-55, 57-60, 63, 64]. Most of these studies examined the effect of eHealth interventions on psychological complaints (n=12; e.g., depression, anxiety, and psychological distress). Of these 12 studies, more than half (7/12, 58%) did not find positive effects [21, 37, 38, 42, 58, 59, 64]. Four studies found positive effects [43, 52, 53, 55]; however, no significant results were found in 2 studies that measured the follow-up effects [44, 53]. Six studies assessed positive or negative adjustment to cancer (e.g., fear of cancer recurrence, mental adjustment, and acceptance), and half of them (3/6, 50%) found positive effects [47, 52-54, 57, 64]. Except for one study, all studies measuring fatigue and sleep quality found positive effects (6/7, 86%) [21, 37, 38, 43, 44, 55, 63]; however, in both studies, where follow-up effects were measured, no significant results were found [37, 44]. All studies measuring menopausal symptoms or body image found positive effects [21, 58, 59]. In total, 7 studies measured outcomes within the dimension *responsiveness* [42, 47, 51, 53, 56, 57, 64]. Mixed effects were found in studies measuring responsiveness in the form of

patient-physician interaction (e.g., satisfaction with information, patient-physician interaction over time) [42, 47, 51, 57]: 2 found positive effects [51, 57] and 2 did not [42, 47]. In addition, 80% (4/5) of the studies measuring patient involvement in the care process (e.g., empowerment, patient activation, self-efficacy, shared decision-making, and being better informed) found positive effects [47, 51, 53, 56, 64]. The interventions used different scales and outcome measures to measure patients' and healthcare providers' experiences with the intervention. The outcome measures were satisfaction rate, usability, and overall appreciation. Overall, users were fairly positive about their experiences with the intervention and gave satisfactory ratings [37, 43, 49, 56, 57, 62, 64]. Participation in the intervention was also assessed using several outcome measures. The most frequently used measurements were loss to follow-up and participation rate. The loss to follow-up ranged from 8.7% to 45.5% and the participation rate ranged from 35% to 90% [21, 37, 38, 42-59, 62-64]. None of the studies measured the dimensions *patient safety*, *timeliness*, *support*, or *accessibility*.

Per Capita Costs

Three studies measured a dimension within the domain *per capita costs* [48, 60, 61]. Two studies [48, 61] measured the dimension *costs of care*, and both found through economic evaluation that the intervention was likely to be equally cost-effective compared with care as usual. One study [60] measured the dimension *volume* and did not find significant effects. None of the studies measured the dimensions *organizational costs* or *productivity loss*.

Discussion

Principal Findings

This systematic review is the first to provide an overview of eHealth interventions in Dutch cancer care and use the Triple Aim framework to examine the empirical evidence of these interventions on population health, quality of care, and per capita costs (the Triple Aim domains). The review focused on Dutch cancer care; however, the results are also relevant to other Western countries involved in digital care for patients with and survivors of cancer. A total of 38 interventions were identified, and the results showed that most eHealth interventions targeted psychosocial factors or problems. In addition, interventions were aimed at many different target groups, including the general population of patients with and survivors of cancer, patients with a specific type of cancer, or patients who experienced a specific problem, such as cancer-related fatigue or smoking behavior. Few interventions were tailored to age, gender, or disease severity. The most common intervention types studied were web portals or web applications. These function to inform and facilitate self-management. Other types of interventions (e.g., electronic health records or video communication tools), functions (e.g., communication or diagnosis), and

target outcomes (e.g., communication with healthcare professionals or access to electronic health records) were rarely found.

Most outcome measures could be related to the Triple Aim domains *population health* and *quality of care*, whereas the *per capita costs* domain was largely neglected. Within the population health domain, mixed effects were found regarding the impact of eHealth on functioning and quality of life. Most studies measuring behavioral and physiological factors found positive effects. More specifically, there was preliminary evidence for the positive effects of eHealth interventions on physical activity and aerobic fitness. None of the studies considered the dimension *participation*, including outcome measures such as social inclusion. Within the quality of care domain, eHealth interventions seemed effective in increasing sleep quality and decreasing fatigue, in line with a meta-analysis showing that eHealth interventions effectively manage fatigue in highly fatigued cancer survivors [65]. Findings in terms of positive and negative adjustment to cancer and psychological complaints were inconsistent. One of the measures that was not considered was accessibility, which is worthy of mention as there is increasing global awareness that eHealth should be equally accessible to different populations [66]. The per capita cost dimension was largely neglected in the evaluation studies; only 3 studies considered dimensions within this domain.

This study yielded several interesting findings. With 38 interventions in Dutch cancer care, there appears to be a wide range of eHealth interventions for patients with and survivors of cancer. It seems valuable that most interventions targeting psychosocial factors or problems were aimed at general psychosocial issues, psychological complaints, patients' self-efficacy, and disease coping. Recent research shows that almost all cancer survivors are affected by fatigue [67], 1 in 2 patients with cancer is significantly distressed, and 47% have problems *getting around* [68]. In contrast, few interventions focused on pain from cancer, which is experienced by half of the patients with cancer during active treatment and 65% of the patients with advanced disease [69]. Some common symptoms of active treatment, such as vomiting, nausea, and constipation [70], were not considered. The lack of tailored interventions according to age, gender, or disease severity is noteworthy as subgroups within these categories are likely to have different preferences and needs. For example, older patients may find it more challenging to use eHealth interventions [71]. In addition, patients in different stages of the disease may have different needs as far as information and support are concerned [14].

We found that most interventions consisted of a specific type (web portals or web applications), function (information provision or facilitation of self-management), and target outcome (psychosocial factors or problems). We assume that besides the interventions we identified, more eHealth interventions are being developed and used by patients with or survivors of cancer. These interventions are likely to be designed or evaluated for a broader target population

than patients with and survivors of cancer alone. For example, multiple studies have evaluated the general use of electronic health records and patient portals in academic hospitals without targeting a specific patient population [72-75]. Our search strategy included only patients with or survivors of cancer as a critical criterion; therefore, our search results did not include these interventions. As a result, the number of interventions available for patients with and survivors of cancer may be more significant and versatile than the results of this review.

Another interesting finding is that the results of the evaluation of study outcomes are mainly in line with the literature. For example, several meta-analyses have been conducted to examine the effect of eHealth on the quality of life of patients with or survivors of cancer. Some do find a statistically significant effect [65, 76], while others do not [77, 78]. These mixed findings, which we also found in the review, can be explained by the fact that quality of life is a multidimensional variable influenced by multiple factors [79]. The current inconsistent findings for psychological complaints and adjustment to cancer were also found in a previous meta-review, which found inconsistent results for the effect of eHealth on psychological well-being, depression, and anxiety in patients with cancer [14]. When interpreting the study results, it is important to remember that many eHealth interventions are not implemented in daily practice. In addition, many expected benefits of such interventions are not realized in daily clinical practice [80, 81], as they are not being used as intended [82, 83]. The latter has several root causes such as lack of trust and digital literacy [84]. The suboptimal use of eHealth interventions in daily practice is a significant problem that future research needs to address.

Finally, it is notable that some domains and dimensions are primarily omitted from the studies, such as per capita costs and participation. The scarcity of per capita cost-related study outcomes is in line with previous research on the effectiveness of eHealth interventions in cancer detection, treatment, and survivorship care [85]. As healthcare costs are increasing in most countries, organizations are actively trying to develop solutions to curb health care expenditures while maintaining access to and harnessing the quality and safety of health care [86]. Digital health care is often viewed as a solution to increasing health care costs. Evaluating eHealth interventions is relevant for adequate resource allocation decisions and designing services for competing health interventions and limited resources. Participation is also an essential theme for eHealth because eHealth interventions can either foster social inclusion or create new risks of social exclusion (e.g., for digitally illiterate patients) [87]. In future studies, it will be essential to consider the needs of patients at risk of social exclusion when developing and evaluating eHealth interventions.

Limitations

This review had some limitations. First, this review may not have included all available eHealth interventions, as not all available interventions have been scientifically evaluated. Gray literature and ongoing studies in trial registries were not included in this review, nor were experts consulted

or authors contacted. Second, the Triple Aim framework used in this review provides a comprehensive overview of the domains and dimensions. However, creating an objective distinction between different dimensions was not always possible. For example, an outcome such as improved sleep quality could be classified as *effectiveness* or *behavioral or physiological factors*. Hence, categorizing outcomes into different dimensions was, to some extent, subjective. Third, for each category of study outcomes, we examined only a small number of studies that evaluated the impact of the intervention on the outcome. Publication bias was not investigated in this study. Therefore, we should be cautious about the conclusions drawn regarding the impact of eHealth interventions on certain subdimensions. Finally, the study protocol was not registered.

Future research

Future research should examine the dimensions of the Triple Aim that have rarely or not been taken into account in previous research, such as participation and accessibility. In addition, studies should consider the per capita costs domain from the Triple Aim and, more specifically, examine whether the eHealth interventions in Dutch cancer care are cost-effective compared with usual care. Furthermore, studies should examine in further detail what explains the mixed results for studies measuring specific dimensions such as functioning and quality of life. This could be done, for example, in experimental studies examining the effect of particular intervention characteristics on the Triple Aim domains. Further research is needed to increase our understanding of how different intervention characteristics influence intervention outcomes and the underlying causal mechanisms that cause an intervention to be effective. Interventions aimed at coping with pain were rarely found. eHealth interventions such as digital training to develop pain coping skills and pain management apps custom-made for patients with cancer have proven feasible and effective in decreasing pain [88, 89]. Future research should explore the potential of such interventions in the Dutch context. Furthermore, this review may be repeated in other countries to compare the intervention characteristics and outcomes of eHealth interventions in cancer care internationally, facilitating learning and sharing best practices. Finally, this review focused on specific eHealth interventions in cancer care. Research on the structural embedding of eHealth interventions in care processes is essential for optimally deploying these interventions. Therefore, future research can examine local care pathways to identify new possibilities for eHealth to address challenges and needs across existing care pathways. Potentially, these insights may lead to new care pathways to optimize cancer care quality.

Conclusion

Most of the 38 interventions in this review included eHealth interventions for patients with or survivors of cancer in the Dutch health care system consisting of a specific type (web portals or web applications), function (information provision and facilitation of self-management), and target outcome (psychosocial factors or problems). Almost none of the interventions were tailored to the needs of patients with or survivors of cancer based on age group, gender, or

disease severity. The Triple Aim domains *population health* and *quality of care* have been studied thoroughly, whereas the domain *per capita costs* is understudied. Most of the included evaluation studies were assigned a moderate quality appraisal score, and selection bias was likely present in most studies. Our results indicate that eHealth could benefit patients and survivors by improving sleep quality, reducing fatigue, and increasing physical activity. Further research is needed to fully understand the effect of eHealth on aspects such as participation (in the form of social inclusion), accessibility, and the effect on quality of life, patient behavior, physiological health, psychological well-being, and per capita costs. Finally, more economic evaluation of eHealth interventions is required. Overall, continuing a holistic evaluation of eHealth interventions in cancer care will be critical to improve population health, enhance the quality of care, and decrease per capita costs.

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Authors' Contributions

LvD, JJA, AV, JNS, and RvdV conceptualized the idea for this review. LvD formulated the review questions and objectives and developed the search strategy. LvD and LS performed the primary search and data extraction. LvD contributed to data analysis and interpretation and wrote the manuscript. RvdV, JJA, AV, JNS, NHC, and LS critically revised the manuscript. All authors read and approved the final version of the manuscript for submission and publication in this journal.

Conflicts of Interest

None declared.

Abbreviations

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

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Multimedia Appendix 1.

Overview of search strategies per database

PubMed (results from 10-06-2021)

("Telemedicine"[majr] OR "telemed*"[ti] OR "teleconference"[ti] OR "teleconsult*"[ti] OR "telecommunication"[ti] OR "telehealth"[ti] OR "tele-health"[ti] OR "tele health"[ti] OR "telecare"[ti] OR "tele-care"[ti] OR "tele care"[ti] OR "electronic health"[ti] OR "mobile health"[ti] OR "mHealth"[ti] OR "eHealth"[ti] OR "m-Health"[ti] OR "e-Health"[ti] OR "telephone"[ti] OR "mobile phone*"[ti] OR "cell phone*"[ti] OR "cellular phone*"[ti] OR "smartphone*"[ti] OR "smart phone*"[ti] OR "mobile technology" OR "wireless"[ti] OR "internet"[ti] OR "Internet"[majr] OR "internet-based"[ti] OR "computer*"[ti] OR "computer-assisted instruction"[ti] OR "multimedia"[ti] OR "email*"[ti] OR "e-mail*"[ti] OR "web"[ti] OR "website*"[ti] OR "web based"[ti] OR "web-based"[ti] OR "online"[ti] OR "on-line"[ti] OR "app"[ti] OR "apps"[ti] OR "digital"[ti] OR "text messag*"[ti] OR "SMS"[ti] OR "short message service"[ti] OR "remote consult*"[ti] OR "telemonitoring"[ti] OR "iphone*"[ti] OR "i-phone*"[ti] OR "virtual community"[ti] OR "home monitor*"[ti] OR "health information technology"[ti] OR "health information systems"[ti] OR "interactive health communication"[ti] OR "patient portal"[ti] OR "webbased"[ti] OR "web-based"[ti] OR "webpage*"[ti] OR "digital decision*"[ti]) AND ("Neoplasms"[Mesh] OR "Neoplas*"[tw] OR "Tumor*"[tw] OR "Tumour*"[tw] OR "Cancer*"[tw] OR "malignan*"[tw] OR "oncolog*"[tw] OR "carcinoma*"[tw] OR "adenoma*"[tw] OR "Medical Oncology"[Mesh]) AND ("Netherlands"[Mesh] OR "Netherlands"[tiab] OR "Holland"[tiab] OR "Dutch"[tiab] OR "Benelux"[tw])

Cochrane (results from 10-06-2021)

Record title:

("telemed*" OR "teleconference" OR "teleconsult*" OR "telecommunication" OR "telehealth" OR "tele-health" OR "tele health" OR "telecare" OR "tele-care" OR "tele care" OR "electronic health" OR "mobile health" OR "mHealth" OR "eHealth" OR "m-Health" OR "e-Health" OR "telephone" OR "mobile phone*" OR "cell phone*" OR "cellular phone*" OR "smartphone*" OR "smart phone*" OR "mobile technology" OR "wireless" OR "internet" OR "internet-based" OR "computer*" OR "computer-assisted instruction" OR "multimedia" OR "email*" OR "e-mail*" OR "web" OR "website*" OR "web based" OR "web-based" OR "online" OR "on-line" OR "app" OR "apps" OR "digital" OR "text messag*" OR "SMS" OR "short message service" OR "remote consult*" OR "telemonitoring" OR "iphone*" OR "i-phone*" OR "virtual community" OR "home monitor*" OR "health information technology" OR "health information systems"

OR "interactive health communication" OR "patient portal" OR "webbased" OR "web-based" OR "webpage*" OR "digital decision*")

AND

Title, abstract, keywords:

("Neoplas*" OR "Tumor*" OR "Tumour*" OR "Cancer*" OR "malignan*" OR "oncolog*" OR "carcinoma*" OR "adenoma*") AND ("Netherlands" OR "Holland" OR "Dutch" OR "Benelux")

(DE ("Telemedicine" OR "Online Therapy" OR "Teleconferencing" OR "Teleconsultation" OR "Telepsychiatry" OR "Telepsychology" OR "Telerehabilitation" OR "Internet" OR "Online Therapy" OR "Smartphones" OR "Mobile Phones" OR "Text Messaging" OR "Websites" OR "Health Information Technology" OR "Decision Support Systems") OR TI ("telemed*" OR "teleconference" OR "teleconsult*" OR "telecommunication" OR "telehealth" OR "tele-health" OR "tele health" OR "telecare" OR "tele-care" OR "tele care" OR "electronic health" OR "mobile health" OR "mHealth" OR "eHealth" OR "m-Health" OR "e-Health" OR "telephone" OR "mobile phone*" OR "cell phone*" OR "cellular phone*" OR "smartphone*" OR "smart phone*" OR "mobile technology" OR "wireless" OR "internet" OR "internet-based" OR "computer*" OR "computer-assisted instruction" OR "multimedia" OR "email*" OR "e-mail*" OR "web" OR "website*" OR "web based" OR "web-based" OR "online" OR "on-line" OR "app" OR "apps" OR "digital" OR "text messag*" OR "SMS" OR "short message service" OR "remote consult*" OR "telemonitoring" OR "iphone*" OR "i-phone*" OR "virtual community" OR "home monitor*" OR "health information technology" OR "health information systems" OR "interactive health communication" OR "patient portal" OR "webbased" OR "web-based" OR "webpage*" OR "digital decision*")) AND (DE ("Neoplasms" OR "Benign Neoplasms" OR "Breast Neoplasms" OR "Endocrine Neoplasms" OR "Leukemias" OR "Melanoma" OR "Metastasis" OR "Nervous System Neoplasms" OR "Terminal Cancer") OR TX ("Neoplas*" OR "Tumor*" OR "Tumour*" OR "Cancer*" OR "malignan*" OR "oncolog*" OR "carcinoma*" OR "adenoma*"))

PsychInfo (results from 14-06-2021)

(DE ("Telemedicine" OR "Online Therapy" OR "Teleconferencing" OR "Teleconsultation" OR "Telepsychiatry" OR "Telepsychology" OR "Telerehabilitation" OR "Internet" OR "Online Therapy" OR "Smartphones" OR DE "Mobile Phones" OR "Text Messaging" OR "Websites" OR "Health Information Technology" OR "Decision Support Systems") OR TI ("telemed*" OR "teleconference" OR "teleconsult*" OR "telecommunication" OR "telehealth" OR "tele-health" OR "tele health" OR "telecare" OR "tele-care" OR "tele care" OR "electronic health" OR "mobile health" OR "mHealth" OR "eHealth" OR "m-Health" OR "e-Health" OR "telephone" OR "mobile phone*"

OR “cell phone*” OR “cellular phone*” OR “smartphone*” OR “smart phone*” OR “mobile technology” OR “wireless” OR “internet” OR “internet-based” OR “computer*” OR “computer-assisted instruction” OR “multimedia” OR “email*” OR “e-mail*” OR “web” OR “website*” OR “web based” OR “web-based” OR “online” OR “on-line” OR “app” OR “apps” OR “digital” OR “text messag*” OR “SMS” OR “short message service” OR “remote consult*” OR “telemonitoring” OR “iphone*” OR “i-phone*” OR “virtual community” OR “home monitor*” OR “health information technology” OR “health information systems” OR “interactive health communication” OR “patient portal” OR “webbased” OR “web-based” OR “webpage*” OR “digital decision*”)) AND (DE (“Neoplasms” OR “Benign Neoplasms” OR “Breast Neoplasms” OR “Endocrine Neoplasms” OR “Leukemias” OR “Melanoma” OR “Metastasis” OR “Nervous System Neoplasms” OR “Terminal Cancer”) OR TX (“Neoplas*” OR “Tumor*” OR “Tumour*” OR “Cancer*” OR “malignan*” OR “oncolog*” OR “carcinoma*” OR “adenoma*”)) AND (TI (“Netherlands” OR “Holland” OR “Dutch” OR “Benelux”) OR AB (“Netherlands” OR “Holland” OR “Dutch” OR “Benelux”))

Web of Science (results from 10-06-2021)

TI=(“telemed*” OR “teleconference” OR “teleconsult*” OR “telecommunication” OR “telehealth” OR “tele-health” OR “tele health” OR “telecare” OR “tele-care” OR “tele care” OR “electronic health” OR “mobile health” OR “mHealth” OR “eHealth” OR “m-Health” OR “e-Health” OR “telephone” OR “mobile phone*” OR “cell phone*” OR “cellular phone*” OR “smartphone*” OR “smart phone*” OR “mobile technology” OR “wireless” OR “internet” OR “internet-based” OR “computer*” OR “computer-assisted instruction” OR “multimedia” OR “email*” OR “e-mail*” OR “web” OR “website*” OR “web based” OR “web-based” OR “online” OR “on-line” OR “app” OR “apps” OR “digital” OR “text messag*” OR “SMS” OR “short message service” OR “remote consult*” OR “telemonitoring” OR “iphone*” OR “i-phone*” OR “virtual community” OR “home monitor*” OR “health information technology” OR “health information systems” OR “interactive health communication” OR “patient portal” OR “webbased” OR “web-based” OR “webpage*” OR “digital decision*”) AND TS=(“Neoplas*” OR “Tumor*” OR “Tumour*” OR “Cancer*” OR “malignan*” OR “oncolog*” OR “carcinoma*” OR “adenoma*”) AND TS=(“Netherlands” OR “Holland” OR “Dutch” OR “Benelux”)

Multimedia Appendix 2.

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist

Table 1. PRISMA 2020 checklist

Section and Topic	Item #	Checklist item	Location where item is reported
Title			
Title	1	Identify the report as a systematic review.	p. 1
Abstract			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	p. 1
Introduction			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	p. 2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	p. 2
Methods			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	p. 3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	p. 3 and Multimedia Appendix 1
Search strategy	7	Present the full search strategies for all databases, registers, and websites, including any filters and limits used.	Multimedia Appendix 1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	p. 3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	p. 3

Section and Topic	Item #	Checklist item	Location where item is reported
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	p. 4 – 5
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Multimedia Appendix 3, 4 and 7
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	p. 5
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Multimedia Appendix 7
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	p. 3 – 4
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	p. 4
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	p. 4
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	p. 4
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n.a.
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	n.a.

Section and Topic	Item #	Checklist item	Location where item is reported
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	p. 19
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	n.a.
Results			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	p. 5 – 6
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	p. 6 and Multimedia Appendix 5
Study characteristics	17	Cite each included study and present its characteristics.	p. 6 – 8 and Table 2
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	p. 8 and Multimedia Appendix 6
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 3 and Multimedia Appendix 7
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	p. 12 – 13 and 20
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Multimedia Appendix 7
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	n.a.
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	n.a.
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	n.a.

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	p. 12
Discussion			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	p. 17 – 19
	23b	Discuss any limitations of the evidence included in the review.	p. 19
	23c	Discuss any limitations of the review processes used.	p. 19
	23d	Discuss implications of the results for practice, policy, and future research.	p. 19 – 20
Other information			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	p. 19
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	p. 19
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	n.a.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	p. 21
Competing interests	26	Declare any competing interests of review authors.	p. 21
Availability of data, code, and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	p. 21

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. http://dx.doi.org/10.1136/bmj.n71

Multimedia Appendix 3.

Characteristics of eHealth interventions for cancer care in the Netherlands

Multimedia Appendix 3 is not included in this dissertation due to its length. It is available online at https://doi.org/10.2196/37093.

Multimedia Appendix 4.

Overview of funding sources per included study

Multimedia Appendix 4 is not included in this dissertation due to its length. It is available online at https://doi.org/10.2196/37093.

Multimedia Appendix 5.

List of excluded studies in the full-text screening stage

Studies are sorted by the reason for exclusion.

No Dutch adult cancer patients or survivors

1. Esser, P., Borchmann, P., Kuba, K., Müller, H., Görgen, H., Kreissl, S., ... & Mehnert, A. (2018). Adaptation of a web-based cognitive-behavioral therapy on fatigue for survivors of Hodgkin's lymphoma. *PPmP-Psychotherapie· Psychosomatik· Medizinische Psychologie*, *68*(08), 316.
2. Matthijs de Wit, L., van Uden-Kraan, C. F., Lissenberg-Witte, B. I., Melissant, H. C., Fleuren, M. A., Cuijpers, P., & Verdonck-de Leeuw, I. M. (2019). Adoption and implementation of a web-based self-management application "Oncokompas" in routine cancer care: a national pilot study. *Supportive Care in Cancer*, *27*(8), 2911-2920.
3. Nguyen, M. H., Smets, E. M., Bol, N., Loos, E. F., van Laarhoven, H. W., Geijsen, D., ... & Van Weert, J. C. (2019). Tailored web-based information for younger and older patients with cancer: randomized controlled trial of a preparatory educational intervention on patient outcomes. *Journal of Medical Internet Research*, *21*(10), e14407.
4. Schuit, A. S., Holtmaat, K., Hooghiemstra, N., Jansen, F., Lissenberg-Witte, B. I., Coupé, V. M., & Verdonck-de Leeuw, I. M. (2020). Efficacy and cost-utility of the eHealth self-management application'Oncokompas', helping partners of patients with incurable cancer to identify their unmet supportive care needs and to take actions to meet their needs: a study protocol of a randomized controlled trial. *Trials*, *21*(1), 1-10.

5. Spahrkäs, S. S., Looijmans, A., Sanderman, R., & Hagedoorn, M. (2020). Beating cancer-related fatigue with the untire mobile app: protocol for a waiting list randomized controlled trial. *JMIR research protocols*, *9*(2), e15969.

Full text article not available

1. Arts, L., Oerlemans, S., van den Berg, S., Prins, J., & van de Poll-Franse, L. (2016, October). Participation and characterization of patients with lymphoma in a web-based self-management intervention. In *Psycho-Oncology, 25*(3), p. 108.
2. Bouma, G., De Vries, E., Wymenga, M., & Walenkamp, A. (2014). Web-Based Tailored Information and Support for Patients with a Neuroendocrine Tumor. In *Neuroendocrinology*, *18*(3-4), 301.
3. Kanera, I. M., Willems, R. A., Bolman, C. A., Mesters, I., & Lechner, L. (2016). Evaluation of the use, appreciation, and adherence to a personalized module referral system of a web-based self-management intervention for early cancer survivors. *Psycho-Oncology*, *25*(S3), 20-20.
4. Van den Berg, S. W., Gielissen, M. F., Van der Graaf, W. T., Ottevanger, P. O., & Prins, J. B. (2013, November). Distress Reduction With an Unguided Self-Management Website for Women After Curative Breast Cancer Treatment: A Multicentre Randomised Controlled Trial. In *Psycho-Oncology, 22,* 112-113.
5. Van de Poll-Franse, L., Arts, L., & Oerlemans, S. (2019). Factors associated with participation in a web-based self-management intervention for lymphoma survivors: findings from an RCT embedded in the population-based PROFILES registry. In *Quality of Life Research* (Vol. 28, pp. S99-S99).

No e-health

1. Batenburg, A., & Das, E. (2014). Emotional approach coping and the effects of online peer-led support group participation among patients with breast cancer: a longitudinal study. *Journal of medical Internet research*, *16*(11), e3517.
2. Van Lent, L. G., Stoel, N. K., van Weert, J., van Gurp, J., de Jonge, M. J., Lolkema, M. P., ... & van der Rijt, C. C. (2019). Realizing better doctor-patient dialogue about choices in palliative care and early phase clinical trial participation: towards an online value clarification tool (OnVaCT). *BMC palliative care*, *18*(1), 1-10.
3. Van Uden-Kraan, C. F., Drossaert, C. H., Taal, E., Lebrun, C. E. I., Drossaers-Bakker, K. W., Smit, W. M., ... & van de Laar, M. A. (2008). Coping with somatic illnesses in online support groups: do the feared disadvantages actually occur? *Computers in human behavior*, *24*(2), 309-324.

Excluded study design

1. Abacioglu, U. (2014). Interview with Florien Boele, MSc, and Martin Klein, MD, VU university medical center, Amsterdam, about the randomised trial on internet-based treatment of depressive symptoms in Glioma patients. *European Association of Neurooncology magazine, 4*(2), 90-91.

Uncompleted trial

1. Van Helmondt, S. (2013). Investigating an online self-help training for fear of cancer recurrence in breast cancer patients. Identification No. NTR4119. Retrieved from: http://www.who.int/trialsearch/Trial2.aspx?TrialID=NTR4119.
2. Van Weert, J.C.M. (2016). Tailoring information to older colorectal cancer patients: Effects of using a web-based patient-directed tool. Identification No. NTR5919. Retrieved from: http://www.who.int/trialsearch/Trial2.aspx?TrialID=NTR5919.

Interventions aimed at (pre-)diagnosis or prediction

1. de Glas, N. A., van de Water, W., Engelhardt, E. G., Bastiaannet, E., de Craen, A. J., Kroep, J. R., ... & Liefers, G. J. (2014). Validity of Adjuvant! Online program in older patients with breast cancer: a population-based study. *The Lancet Oncology*, *15*(7), 722-729

Multimedia Appendix 6.
Quality appraisal of the empirical evaluation studies

Table 1. Quality appraisal of the empirical evaluation studies

Intervention	Selection bias	Study design	Confounders	Blinding	Data collection	Withdrawals and dropouts	Global rating
Cancer Aftercare Guide (Kanker Nazorg Wijzer)							
Study 1 [1]	weak	strong	strong	moderate	strong	moderate	moderate
Study 2 [2]	weak	strong	strong	moderate	strong	moderate	moderate
Study 3 [3]	weak	strong	strong	moderate	strong	moderate	moderate
Study 4 [4]	weak	strong	strong	moderate	strong	moderate	moderate
OncoCompass (OncoKompas)							
Study 1 [5]	weak	strong	strong	moderate	strong	moderate	moderate
Study 2 [6]	weak	strong	strong	moderate	strong	moderate	moderate
Transmural Oncologal Support (TOS)							
Study 1 [7]	moderate	weak	weak	moderate	weak	weak	weak
Study 2 [8]	strong	strong	strong	moderate	weak	strong	moderate
Everything under control (Alles onder controle) [9]	weak	strong	strong	moderate	strong	weak	weak
Prostate cancer decision aid (Prostaatkanker keuzehulp) [10]	moderate	strong	strong	moderate	strong	strong	strong
Less tired (Minder Moe) [11]	weak	strong	strong	moderate	strong	moderate	moderate
Less tired for anxiety/ depression complaints [12]	weak	strong	strong	moderate	strong	strong	moderate
BREATH [13]	moderate	strong	strong	moderate	strong	strong	strong
Less fear after cancer (Minder angst bij kanker) [14]	moderate	strong	strong	moderate	strong	moderate	strong
OncoActive [15]	weak	strong	weak	moderate	strong	strong	weak
PatientTIME [16]	moderate	strong	weak	moderate	strong	strong	moderate
ENCOURAGE [17]	moderate	strong	strong	moderate	strong	strong	strong

Intervention	Selection bias	Study design	Confounders	Blinding	Data collection	Withdrawals and dropouts	Global rating
Cancer, Intimacy and Sexuality (Kanker, Intimiteit en Seksualiteit)							
Study 1 [18]	weak	strong	strong	moderate	strong	strong	moderate
Study 2 [19]	weak	strong	strong	moderate	strong	moderate	moderate
No name. *Home monitoring tool for adequate pain treatment* [20]	moderate	weak	strong	moderate	strong	strong	moderate
EvaOnline							
Study 1 [21]	weak	strong	strong	moderate	strong	strong	moderate
Study 2 [22]	weak	strong	weak	moderate	strong	strong	moderate
No name. *Home-based exercise intervention*							
Study 1 [23]	weak	strong	strong	moderate	weak	strong	weak
Study 2 [24]	weak	strong	strong	moderate	strong	strong	moderate
My-GMC [25]	weak	strong	strong	moderate	strong	moderate	moderate
No name. *Teleconsultation for patients receiving palliative home care* [26]	weak	strong	strong	moderate	strong	weak	weak

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[2] R. A. Willems, I. Mesters, L. Lechner, I. M. Kanera, and C. A. W. Bolman, "Long-term effectiveness and moderators of a web-based tailored intervention for cancer survivors on social and emotional functioning, depression, and fatigue: randomized controlled trial," *Journal of cancer survivorship,* vol. 11, no. 6, pp. 691-703, 2017. http://dx.doi.org/10.1007/s11764-017-0625-0.

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Multimedia Appendix 7.

Overview of outcome measures and found effects per empirical evaluation study

Multimedia Appendix 7 is not included in this dissertation due to its length. It is available online at https://doi.org/10.2196/37093.

Multimedia Appendix 8.

Overview of measured study outcomes per empirical study

Table 1. Overview of measured study outcomes per empirical study

Intervention	Population health					Quality of care						Per capita costs			
	Health outcomes (a)	Disease burden (b)	Behavioural/ physiological factors (c)	Participation (d)	Functioning/ Quality of life (e)	Patient safety (f)	Effectivity (g)	Responsiveness (h)	Timeliness (i)	Support (j)	Accessibility (k)	Costs of care (l)	Volume (m)	Organisational costs (n)	Productivity loss (o)
Cancer Aftercare Guide (Kanker Nazorg Wijzer)															
Study 1 [1]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Study 2 [2]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Study 3 [3]	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Study 4 [4]	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
OncoCompass (OncoKompas)															
Study 1 [5]	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0
Study 2 [6]	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
Transmural Oncologal Support (TOS)															
Study 1 [7]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Study 2 [8]	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
Everything under control (Alles onder controle) [9]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Prostate cancer decision aid (Prostaatkanker keuzehulp) [10]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Intervention	Population health					Quality of care						Per capita costs			
	Health outcomes (a)	Disease burden (b)	Behavioural/ physiological factors (c)	Participation (d)	Functioning/ Quality of life (e)	Patient safety (f)	Effectivity (g)	Responsiveness (h)	Timeliness (i)	Support (j)	Accessibility (k)	Costs of care (l)	Volume (m)	Organisational costs (n)	Productivity loss (o)
Less tired (Minder Moe) [11]	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Less tired for anxiety/ depression complaints [12]	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0
BREATH [13]	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Less fear after cancer (Minder angst bij kanker) [14]	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
OncoActive [15]	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0
PatientTIME [16]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
ENCOURAGE [17]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Cancer, Intimacy and Sexuality (Kanker, Intimiteit en Seksualiteit)															
Study 1 [18]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Study 2 [19]	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0
No name. *Home monitoring tool for adequate pain treatment* [20]	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
EvaOnline															
Study 1 [21]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Study 2 [22]	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
No name. *Home-based exercise intervention*															
Study 1 [23]	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Study 2 [24]	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
My-GMC [25]	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0
No name. *Teleconsultation for patients receiving palliative home care* [26]	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0
Total	1	3	6	0	13	0	17	24	0	0	0	2	1	0	0

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