



# Effects of patient navigation on satisfaction with cancer care: a systematic review and meta-analysis

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## Abstract

**Purpose** Patient navigation (PN) is a model of healthcare coordination designed to reduce barriers to achieving optimal health outcomes. Systematic reviews evaluating whether PN is associated with higher patient satisfaction with cancer care are lacking.

**Methods** We conducted a systematic review to synthesize evidence of comparative studies evaluating the effectiveness of PN programs to improve satisfaction with cancer-related care. We included studies reported in English that: (1) evaluated a PN intervention designed to increase satisfaction with cancer care; and (2) involved a randomized controlled trial (RCT) or non-RCT approach. Standardized forms were used to abstract data from studies. These data were evaluated for methodological quality, summarized qualitatively, and synthesized under a random effects model.

**Results** The initial search yielded 831 citations. Nine met inclusion criteria. Five had adequate data (1 RCT and 4 non-RCTs) to include in the meta-analysis. Methodological quality of included studies ranged from weak to strong, with half rated as weak. Findings of the RCTs showed a statistically significant increase in satisfaction with cancer care involving PN (standardized mean difference (SMD) = 2.30; 95% confidence interval 1.79, 2.80,  $p < 0.001$ ). Pooled results from non-RCTs showed no significant association between PN and satisfaction with cancer-related care (standardized mean difference = 0.39; 95% confidence interval - 0.02, 0.80,  $p = 0.06$ ).

**Conclusions** Although PN has been widely implemented to improve cancer care, high-quality studies are needed to characterize the relationship between PN and satisfaction with cancer-related care.

**Keywords** Systematic review · Patient navigation · Patient satisfaction · Cancer early detection · Meta-analysis

## Introduction

Patient navigation (PN) is a patient-centered healthcare delivery model that involves provision of support and guidance by trained lay or professional (e.g., nurse) navigators. Support and guidance are strategically delivered to help patients

overcome barriers to obtaining optimal and timely cancer-related care and effectively utilize available cancer care resources. Three models of PN have been recommended based on navigator training and background [1, 2]. The first model emphasizes that navigators who provide screening, diagnostic, treatment, and survivorship PN should have specific professional training, such as nursing [3]. A second model indicates that the most important qualification of a patient navigator is being a “cultural broker and interpreter” who is from communities served by the PN program [4]. A third model indicates that a multidisciplinary team of lay and professional navigators should provide PN [5–7]. Some narrative and systematic reviews have found PN improves receipt and timeliness of cancer early detection care [8–11]. However, it is unknown whether PN improves receipt of cancer treatment [9, 10, 12, 13].

Patients’ satisfaction with cancer-related care is influenced by the degree to which healthcare experienced is perceived to match expectations. Patient satisfaction is frequently assessed

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when evaluating PN programs. Multiple working groups at the 2010 National Patient Navigation Leadership Summit recommended patient satisfaction with care as a key metric to evaluate PN interventions [14, 15]. As PN programs have been widely implemented in cancer care, the Academy of Oncology Nurse and Patient Navigators has recommended assessing patient satisfaction as an indicator of the “patient experience” [16]. Numerous studies have evaluated whether PN is associated with improved satisfaction with cancer-related care, but to date this research has not been critically evaluated or synthesized. In the present study, we critically assessed and synthesized currently available evidence on the effect of PN interventions (intervention) on satisfaction with cancer care (outcome) as compared to those not receiving PN (comparison). Participants included those being provided any type of cancer care. Study designs included randomized controlled trials (RCTs), case control trials, or quasi-experimental designs.

## Materials and methods

### Search strategy

A study protocol was developed a priori outlining the methodology for the present systematic review. In collaboration with a health librarian, an extensive literature search was conducted for relevant studies published between 1995 (year the first PN study was published) and May 25, 2016. The search strategy included MeSH terms and other identified key words (Fig. 1). Our research team searched multiple databases (PubMed/MEDLINE, CINAHL, Web of Science, PsycINFO) to locate studies that focused on evaluating effect of PN on satisfaction with cancer care.

Citations identified through four database searches were exported to the reference manager software Endnote® [17]. After completion of all searches, duplicate citations were removed, and titles and abstracts of remaining articles were reviewed by one study author to determine whether each study was eligible for inclusion in the systematic review. The final inclusion decision was based on a review of full text of the article describing that specific study. In addition, reference lists of all studies included in this systematic review were examined to identify additional published or unpublished studies that may not have been discovered during initial database searches. The same process was used to review articles identified from study references.

### Inclusion criteria

Studies were included if they evaluated a PN program related to cancer care, measured patient satisfaction following a PN intervention, and compared it with a measurement of patient

satisfaction among individuals who did not receive PN. Patient satisfaction was defined as the extent to which a person’s experience paralleled with his or her expectations [18]. For the purpose of this systematic review, we defined PN using a previously published definition of PN [10]. Thus, PN was defined as a barrier-focused intervention with the following common characteristics: (1) PN is provided to individual patients for a defined episode of cancer-related care (e.g., evaluating an abnormal screening test); (2) PN has a definite endpoint where services provided are complete (e.g., patient achieves diagnostic resolution following a screening abnormality); (3) PN targets a defined set of health services that are required to complete an episode of cancer-related care; (4) PN services focus on identification of individual patient-level barriers to accessing cancer care; and (5) PN aims to reduce delays in accessing the continuum of cancer care services [10]. Studies were included if they described interventions delivered by a patient navigator (paid or voluntary) in a community or medical setting that was intended to facilitate the following types of cancer-related care: screening, diagnostic resolution, initiation and completion of treatment, survivorship, genetic testing, and cancer clinical trials. Studies implementing any model of PN were included. Comparison groups in these studies included those that provided any health promotion intervention (i.e., health education, reminders) which did not involve the services of a patient navigator. Comparison groups also included participants who received no intervention or were placed in a wait-list control group. To be included, each study was required to have participants complete a measure of patient satisfaction with cancer-related care administered via self-report or interview.

Additionally, studies were eligible for inclusion in this systematic review if they used one of the following research approaches: RCT, case control trial, or a quasi-experimental design. Studies without comparison groups, review papers, and case studies were excluded. Furthermore, studies not published in English and those with fewer than five participants in each group were excluded. Both unpublished and published studies were eligible for inclusion. Unpublished studies included abstracts, conference presentations, unpublished theses and dissertations, or findings from studies that had been conducted but were not yet published in peer-reviewed or gray literature.

### Data abstraction and management

Name of first author and publication year were used to identify each article in the present review. Two reviewers independently reviewed full text of all studies and abstracted data using a standardized data abstraction form that was modified from a previous systematic review [19]. A third researcher reviewed all data on the two sets of data abstraction forms for

**Fig. 1** Systematic review search strategy

Time Period: all 1995-May 25, 2016

Language: English

**PubMed Search Strategy**

1. (“patient navigation”[MeSH Terms] OR “navigation”[Text Word] OR “navigator”[Text Word] OR “patient navigat\*”[Text Word] OR “client navigat\*”[Text Word] OR “clinical navigat\*”[Text Word] OR “system navigat\*”[Text Word] OR “professional navigat\*”[Text Word] OR “lay navigat\*”[Text Word] OR “nurse navigat\*”[Text Word] OR “Native American navigat\*”[Text Word] OR “health navigat\*”[Text Word] OR “navigation service”[Text Word] OR “navigation program center”[Text Word] OR “lay coordinat\*”[Text Word] OR “client coordinat\*”[Text Word] OR “care coordinator”[Text Word])

AND

1. (“patient satisfaction”[MeSH Terms] OR “patient satisfaction”[Text Word] OR “satisfaction with care”[Text Word])

**CINAHL Search Strategy**

1. (MH "Patient Navigation") OR TX "navigation" OR TX "navigator" TX "patient navigat\*" OR TX "client navigat\*" OR TX "clinical navigat\*" OR TX "system navigat\*" OR TX "professional navigat\*" OR TX "lay navigat\*" OR TX "nurse navigat\*" OR TX "Native American navigat\*" OR TX "health navigat\*" OR TX "navigation service" OR TX "navigation program center" OR TX "lay coordinat\*" OR TX "client coordinat\*" OR TX "care coordinator")

AND

1. (MH "Patient Satisfaction" OR TX "Patient Satisfaction" OR TX "satisfaction with care")

**PsychINFO Search Strategy**

1. (KW "Patient Navigation") OR TX "navigation" OR TX "navigator" TX "patient navigat\*" OR TX "client navigat\*" OR TX "clinical navigat\*" OR TX "system navigat\*" OR TX "professional navigat\*" OR TX "lay navigat\*" OR TX "nurse navigat\*" OR TX "Native American navigat\*" OR TX "health navigat\*" OR TX "navigation service" OR TX "navigation program center" OR TX "lay coordinat\*" OR TX "client coordinat\*" OR TX "care coordinator")

AND

1. (KW "Patient Satisfaction" OR DE "Client Satisfaction" OR TX "Patient Satisfaction" OR TX "satisfaction with care")

**Web of Science Search Strategy**

1. ("Patient Navigation" OR "navigation" OR "navigator" OR "patient navigat\*" OR "client navigat\*" OR "clinical navigat\*" OR "system navigat\*" OR "professional navigat\*" OR "lay navigat\*" OR "nurse navigat\*" OR "Native American navigat\*" OR "health navigat\*" OR "navigation service" OR "navigation program center" OR "lay coordinat\*" OR "client coordinat\*" OR "care coordinator")

AND

1. ("Patient Satisfaction" OR "satisfaction with care")

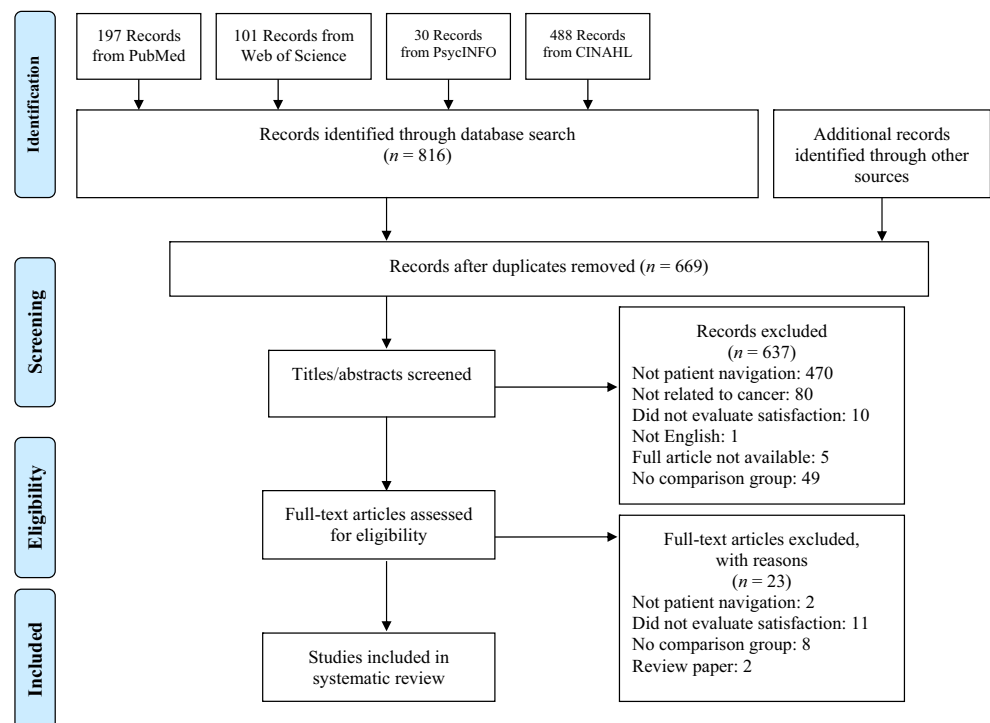
disagreements. Disagreements in data abstraction were resolved by consensus in collaboration with the third reviewer.

The primary study outcome was patient satisfaction with some aspect of cancer care. In addition, we abstracted data regarding whether the following variables influence the relationship between PN interventions and satisfaction with cancer-related care: sample characteristics (e.g., sample size, gender, age, race, ethnicity, education), PN intervention settings (e.g., urban, rural, medical or community centers), study design, measurement of patient satisfaction, model of PN intervention, type of cancer, and phase of cancer care targeted by the PN intervention.

## Quality assessment

Quality of evidence for each study was examined using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies [20], which evaluates the following components of study quality: selection bias, bias due to study design, confounders, blinding of outcome assessment, data collection methods, and withdrawals and drop-outs. The strength of each component and global ratings range from weak to strong. Additional key assessment components included: type of comparison group, matching of control to intervention participants in quasi-experimental studies, length of time from baseline to follow-up, length of intervention, recruitment method, adherence to sampling period used for intervention, use of intention-to-treat analysis, and unit of randomization.

**Fig. 2** Diagram of study identification and selection process



## Statistical analysis

Data from RCTs and observational studies were pooled separately. Continuous data (i.e., overall patient satisfaction in both intervention and comparison groups at follow-up) were pooled under a random effects model and summarized as standardized mean difference along with 95% confidence intervals. Heterogeneity was assessed using  $I^2$  values where an  $I^2 > 50\%$  was considered significant. The meta-analysis was performed using Review Manager 5.3 [21].

## Results

### Study identification

Initial database searches yielded 816 articles (Fig. 2). Review of reference sections of these 816 articles revealed an additional 15 studies. Duplicate studies were removed along with 637 others based on reviews of their titles and abstracts. Thirty-two studies were retained, and full text of these studies was thoroughly reviewed to determine eligibility for inclusion in our analysis. Of these 32 studies, 23 did not meet inclusion criteria. Studies were excluded for the following reasons: did not include a PN intervention ( $n = 2$ ), did not assess satisfaction with cancer care following a PN intervention ( $n = 11$ ), no comparison group ( $n = 8$ ), and reviews of literature ( $n = 2$ ). Nine peer-reviewed published studies [22–30] were included

in our systematic review (see Table 1), which made it impossible to adequately assess for publication bias.

## Methodological quality

Based on criteria of the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies [20], methodological quality of eight studies in this systematic review ranged from weak to strong. Two studies were rated as strong [25, 26], two were rated as moderate [24, 27], and four were rated as weak quality (Table 2) [22, 23, 28, 29]. One study [30] was not rated for methodological quality because it pooled data from eight other studies, making it impossible to provide specific data required to rate methodological quality. Additionally, the three studies that found PN was associated with higher satisfaction had quality ratings of “weak” [28], “moderate” [24], and “strong” [25]. The other five studies which found no relationship between patient satisfaction and PN were also rated as “weak” [22, 23, 29], “moderate” [27], and “strong” [26]. Multiple studies displayed weak ratings related to selection bias, handling of confounders, data collection methods, and tracking of withdrawals and dropouts.

## Characteristics of studies

**Measurement of study outcome: patient satisfaction** There were multiple self-report measures used to assess patient satisfaction. Five studies assessed patient satisfaction using measures with psychometric validation, ranging from calculation of internal consistency using Cronbach’s alpha to application of factor analysis and principal components analysis, as well as item response theory analysis. These measures included a modified version of the Satisfaction with Hospital Care Questionnaire [24, 31], the 18-item Patient Satisfaction with Cancer-Related Care (PSCC) scale [26, 30, 32], the European Organisation for Research and Treatment of Cancer quality of life group cancer inpatient satisfaction questionnaire (EORTC QLQ-SAT32) [25, 33], and the 18-item Patient Satisfaction Questionnaire (PSQ-18) [27, 34]. One study reported using a 29-item version of the PSCC (which included items discarded based on principal components analysis of the initial item pool) [29]. The remaining studies ( $n = 3$ ) utilized non-psychometrically validated scales or surveys, including a single-item measure of satisfaction with care [22], an 8-item measure of satisfaction with care [28], and a 12-item measure of satisfaction with care comprised of items used in previous patient satisfaction tools [23].

There was limited information regarding assessment of reliability or validity of satisfaction measures among each study’s participants. Four studies reported information regarding internal consistency of the satisfaction measure that was calculated from participants’ responses, and all of these studies indicated that there was evidence of internal consistency

for the measures used [24, 27, 28, 30]. Of three studies reporting that PN was associated with higher patient satisfaction, two used measures with evidence demonstrating their reliability or validity. Half of the studies that reported no statistically significant group difference in satisfaction between PN and control groups used patient satisfaction measures with evidence of reliability or validity [26, 27, 30].

Overall, we found satisfaction with cancer care to be moderate or high across most studies. In one study [22], mean patient satisfaction with cancer care scores were relatively high in both PN and control groups. Other studies dichotomized single items measuring satisfaction at “excellent” versus “not excellent” [23], or the entire patient satisfaction survey as “high satisfaction” versus “not high satisfaction” [26, 30]. The three studies that showed more variation in satisfaction had significantly lower patient satisfaction scores in the control groups [24, 25, 28]. Nonetheless, even the control groups had moderate to high levels of patient satisfaction [24, 25, 28].

**Study sample characteristics** Baseline sample sizes for each individual study ranged from 44 to 1788 participants, with one study [30] including two samples—one sample assessing satisfaction with cancer diagnostic care and the other sample assessing satisfaction with cancer treatment. The combined samples of all the studies included in the present systematic review comprised 4210 individuals who completed satisfaction measures. Most of these studies provided PN to diverse populations (e.g., medically underserved racial-ethnic minority and lower income populations) [23, 26, 27, 30], non-English speakers [23], and people with a high school education or less [23, 24, 26–28, 30]. Two of these studies found that PN was associated with increased patient satisfaction in these populations [24, 28]. Additionally, two of the three studies that reported that PN was significantly associated with at least some increases in patient satisfaction were conducted outside of the USA (i.e., Korea and Canada), and provided minimal information about participants’ demographic characteristics [25, 28].

**Model of patient navigation** Four PN studies utilized a nurse-delivered model of PN [22, 25, 27, 28], and three studies used a lay PN model [24, 26, 29]. One study that pooled data from multiple studies included multiple models of PN [30]. Another study did not specify the type of PN model [23]. Of the three studies that found some indication that PN was effective in improving some aspect of patient satisfaction, two implemented nurse navigation models [25, 28] and one used a lay PN model [24].

**Type of cancer and point on cancer continuum** There was significant heterogeneity in studies included in this systematic review in terms of type of cancer care targeted by the PN



**Table 1** Summary of studies evaluating the effect of patient navigation on satisfaction with cancer-related care

Study	Study design and setting	Intervention	Baseline sample characteristics	Description of satisfaction measure	Description of satisfaction findings
Campbell (2010)	Quasi-experimental; comparison of survey results between patients who received usual care (CON) or those referred to PNP (INT) Private comprehensive community cancer center, suburban area in southeastern USA	PNP included one-on-one interview to develop a plan of action and identify the need for additional intervention. PN was an RN who followed patients with breast cancer from preoperative assessment through surgery; provided services of cancer care orientation, care coordination, patient education, resource identification, referral for financial needs, and other community-based services.	N = 100 Mean age 54.5 years Race White (85%); Black (15%); Primary pay Source: Self-pay (24%); Medicare (9%); Medicaid (3%); Private insurance (64%)	One statement assessing overall satisfaction with care received at the cancer center The statement was rated using Likert scale format (1 = "strongly disagree" to 5 = "strongly agree") No tests of validity or reliability were performed.	INT and CON did not significantly differ in ratings for satisfaction survey statement (4.82 vs. 4.12; $p = 0.207$ )
Donelan (2010)	Prospective cohort study; comparison of patients enrolled in PNP (INT) to non-navigated patients (CON) The Avon Foundation Comprehensive Breast Evaluation Center at Massachusetts General Hospital, Boston, MA	PNP program facilitated access to service and assured timely follow-up of abnormal mammographic findings among women referred to the Avon Center PNs assisted with appointments and helped patients access services as needed, including transportation, financial, insurance, and interpretation	N = 253 Navigated N = 72 Race: White (39%); Non-white (45%) Ethnicity: Hispanic (64%); Non-Hispanic (35%) Primary language: English (49%); Spanish (51%) Health insurance: Insured (79%); Uninsured (19%) Non-navigated N = 181 Race: White (87%); Non-white (8%) Ethnicity: Hispanic (5%); Non-Hispanic (92%) Primary language: English (97%); Spanish (3%) Health insurance: Insured (97%); Uninsured (2%)	Survey developed from other patient satisfaction instruments, was modified for use in lower literacy and limited English proficiency populations. Uses a 5-point scale of "excellent," "very good," "good," "fair," and "poor." Significance tests were conducted comparing "excellent" vs. all other responses between INT and CON groups	The percentage of patients that rated overall quality of care, as well as satisfaction with 9 specific aspects of care as "excellent" did not significantly differ between INT and CON groups (55% vs. 62%; $p = 0.294$ ). INT were significantly less likely than CON to rate the concern shown for their cultural/religious beliefs as "excellent" (45% vs. 54%; $p = 0.014$ )
Ferrante (2007)	RCT; participants randomized to usual care (CON) or usual care plus intervention with a PN (INT) Urban university hospital, Newark, NJ	PN provided patients with emotional and social support; helped with scheduling and arriving at appointments on time; facilitated applications for financial assistance; connected patients with resources and support systems; facilitated interaction and communication with healthcare staff and providers. PN was an African-American with a bachelor's degree in social relations and experience as a youth advocate, rehabilitation counselor, and breast cancer support group volunteer; trained on-site in breast health and public speaking skills; and received orientation and observation with mammography van unit, radiologists, breast surgeons, oncologists, social workers, and financial assistance personnel.	N = 105 Mean age: 50.1 years (SD = 11.6) Race/ethnicity Black (59%); Hispanic (27.6%); Other (13.3%) Health Insurance: None (60%); Government (24.8%); Private (15.2%)	Adaptation of "Satisfaction with Hospital Care Questionnaire" 15 items on a 5-point scale (1 = "dissatisfied" to 5 = "very satisfied"). An overall mean satisfaction score was calculated for all subjects based on the sum of their responses to the survey divided by the number of items. Cronbach $\alpha = 0.95$	Mean patient satisfaction scores were significantly higher for INT compared to the CON group (4.3 vs. 2.9; $p < 0.001$ )
Fillion. (2009)			N = 158		

**Table 1** (continued)

Study	Study design and setting	Intervention	Baseline sample characteristics	Description of satisfaction measure	Description of satisfaction findings
	Retrospective cohort study; comparison of patients who received care before (CON) and after (INT) implementation of a head and neck cancer PNP. University hospital, Canada	PNs were professional “Pivot Nurses in Oncology” who assessed needs, managed symptoms, educated and supported patients, and facilitated coordination	Mean age 64.0 years Mean years of education 10.2	French version of EORTC-SAT32 questionnaire Measures several dimensions of patient satisfaction (doctors, team, hospital). Total scores range from 0 to 100, with higher scores indicating higher satisfaction with care	1. Overall satisfaction was significantly higher for INT vs. CON (90.7 vs. 85.5; $p = 0.03$ ). 2. Some aspects of satisfaction toward doctors (availability, interpersonal qualities, technical skills, information provision), the oncology team (psychosocial support, information), and the hospital (waiting time) were significantly higher for INT compared to CON (all $p < .05$ ). 3. Other aspects of satisfaction toward the oncology team (availability, technical skills) and hospital (access, other hospital personnel kindness and helpfulness and information giving, exchange of information with the care team, comfort, and cleanliness) were similar in the INT compared to CON (all $p > 0.06$ )
Fiscella (2012)	RCT; participants randomized to usual care (CON) or usual care plus intervention with a PN (INT) 2 PNRP sites, Denver, CO and Rochester, NY	PNP used various strategies to address barriers. PNs were laypersons from the community; <i>trained</i> locally and nationally to act as guides and coaches; provided supportive contact with the patient, distributed educational materials, promoted treatment adherence, facilitated coordination of care and access to financial resources and community supports.	$N = 438$ Mean age 57 years Race/ethnicity: Black (20.3%); White (55.9%); Hispanic (17.8%); Other (5.3%) Primary language: English (90.6%); Other (9.4%) Health insurance: None (18.5%); Public (29.5%); Private (52.1%) $N = 137$ Mean age 55.26 years (SD = 12.3) Education: Less than high school (4.4%); High school (50.4%); College graduate (28.5%); Graduate degree (16.8%)	Patient Satisfaction with Cancer-related Care scale (PSCC) 18-item validated measure. Each item is rated on a 5-point Likert scale (1 = “not satisfied” to 5 = “very satisfied”). Total scores range from 18 to 90 with higher scores indicating higher satisfaction with care. A dichotomous outcome using the 25th percentile as a cutoff ( $\leq 75$ vs. $> 75$ ) was created because the distribution of responses was skewed toward high satisfaction (coefficient of skewness = 0.50)	No statistically significant difference in proportion of patients who had a higher satisfaction score between INT and CON
Harding (2014)	Quasi-experimental; participants at community hospital received routine care (CON), and participants at National Accreditation Program for Breast Centers-designated center received PNP (INT) 2 Northern Appalachian outpatient radiology clinics (1 community hospital, 1 breast cancer center)	PNs were nurse navigators who provided education and support to women undergoing breast biopsy, addressed financial and transportation issues, scheduled and coordinated care among healthcare providers, and served as a point of contact.	Mean age 55.26 years (SD = 12.3) Education: Less than high school (4.4%); High school (50.4%); College graduate (28.5%); Graduate degree (16.8%)	18-item Patient Satisfaction Questionnaire (PSQ-18) PSQ-18 has seven subscales. Reliability coefficients for the subscales are reported to range from 0.64 (communication) to 0.77 (time spent) Cronbach $\alpha = 0.87$	No statistically significant differences in patient satisfaction between INT and CON as measured by any subscale or the total PSQ-18 (67.25 vs. 66.58; $t = -0.401$ ).
Lee (2011)	Quasi-experimental; participants at 1 hospital received routine care (CON), and participants at another hospital received PNP (INT) University medical center in Korea	PNP included ongoing monitoring of patient progress related to cancer care issues, service needs, and compliance with self-care practices. PN coordinated patient care, helped with scheduling appointments and financial issues, served as primary contact for patient. PN also provided patient referrals, emotional support, and patient and family education. PNs were nurses with at least bachelor's degrees working in cancer units at an INT hospital; <i>trained</i> for 3 weeks ( $\geq 60$ h practical training) in areas that	$N = 78$ Mean age 49.16 years Education: High school (44.9%); College (55.1%);	Level of satisfaction with cancer care questionnaire, 8-item questionnaire. Each item is rated using a 4-point Likert scale (1 = “strongly agree” to 4 = “strongly disagree”). Total scores range from 8 to 32 with higher scores indicating lower satisfaction with care. Cronbach $\alpha = 0.93$	INT participants were more significantly more satisfied with care compared to CON (11.45 vs. 14.95; $p = 0.000$ ).

**Table 1** (continued)

Study	Study design and setting	Intervention	Baseline sample characteristics	Description of satisfaction measure	Description of satisfaction findings
Post (2015)	RCT with nested cohort; clinics randomized to receive PNP (INT) or educational materials by mail (CON). 18 clinics in Central OH	included professional nursing practice, consultation and counsel, coordination and collaboration, education, research and quality improvement, and leadership. Telephone-based PN intervention focused on identifying barriers to care and providing assistance tailored to participants' specific needs. PNs were 3 female laypersons over the age of 30 who had graduated from college, previously worked in the healthcare system, and completed multiple training sessions.	$N = 708$ Mean age 46 years (SD = 12.3) Race: White (73%); Other (27%) Health insurance: Private (75%); Other (25%)	PSCC 29-item version of this survey assessing patient satisfaction. Each item is rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). Total scores range from 20 to 100 with higher scores indicating higher satisfaction with care.	No statistically significant difference between INT and CON in mean increase in PSCC from baseline to end-of-study (3.26 vs. 2.53; $p = 0.43$ )
Wells (2015)	Multisite study; participants received INT (PNP) or CON (usual care or usual care plus written materials). 8 PNRP sites in Boston, MA; Chicago, IL; Denver, CO; Columbus, OH; Rochester, NY; San Antonio, TX; and Tampa, FL	PNP included support and guidance in accessing and managing the cancer care system, overcoming barriers, and activating timely, quality care provided in a culturally sensitive manner. PNs were lay navigators or professional navigators, <i>trained</i> by the PNRP and site-specifically	Abnormal screen $N = 1788$ Mean age 45 years (SD = 2) Race/ethnicity: Black (24.6%); White (37.2%); Hispanic (36.3%); Other (1.9%) Primary language: English (73.9%); Spanish (26.1%) Health insurance: Uninsured (27.9%); Public (35.6%); Private (36.0%) Definitive diagnosis $N = 445$ Mean age 56 years (SD = 0.87) Race/ethnicity: Black (24.7%); White (56.0%); Hispanic (15.7%); Other (4.0%) Primary language: English (91.2%); Spanish (9.2%) Health insurance: Uninsured (16.2%); Public (31.0%); Private (53.0%)	PSCC 18-item validated measure. Each item is rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). Total scores range from 18 to 90 with higher scores indicating higher satisfaction with care. Cronbach $\alpha = 0.94$ . Spanish Cronbach $\alpha = 0.94$ . A dichotomous outcome using the median as a cutoff (diagnostic resolution, 75; cancer treatment, 80) was created because the distribution of responses was skewed toward high satisfaction (coefficient of skewness = 0.90; $-1.68$ )	No statistically significant differences in PSCC between INT and CON at diagnostic resolution or within 3 months of initiating cancer treatment ( $p > 0.05$ )

CON control group, INT intervention group, PNP patient navigation program, PNRP Patient Navigation Research Project, RCT randomized controlled trial, SD standard deviation



**Table 2** Component and global assessment of study

Study	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Global rating
Campbell (2010)	3	2	3	2	3	2	3
Donelan (2010)	3	2	3	2	3	2	3
Ferrante (2007)	3	1	1	2	1	1	2
Fillion (2009)	2	2	1	2	2	2	1
Fiscella (2012)	2	1	1	2	1	1	1
Harding (2015)	2	2	1	2	1	3	2
Lee (2011)	2	2	1	3	3	3	3
Post (2014)	2	1	3	2	3	1	3

EPHPP ratings: 1 = Strong; 2 = Moderate; 3 = Weak

intervention. Most studies had samples that combined patients with different types of cancer or different types of cancer-related abnormalities [22, 26, 28–30]. Two studies conducted with patients who received PN following abnormal test results found that PN was not related to higher patient satisfaction [29, 30]. Only one [28] of four studies conducted with patients diagnosed with cancer [22, 26, 28, 30] found that patients were more satisfied if they received PN compared to those who received usual care.

The remaining four studies narrowly focused on care related to one specific type of cancer. These studies included individuals who had an abnormal test finding for breast cancer [23, 24, 27] or individuals who were diagnosed with head and neck cancer [25]. Two of the breast cancer studies reported no significant differences in patient satisfaction between participants who received PN and those who did not [23, 27], and one study found those who received PN were more satisfied than those who received usual care [24]. The study of patients receiving treatment for head and neck cancer indicated that PN improved some aspects of patient satisfaction [25].

**Setting of Patient Navigation Intervention** In four studies, PN was provided in hospitals [22, 24, 25, 28], including a comprehensive cancer center [22], university-affiliated hospitals [24, 28], and the oncology clinic of a university hospital [25]. Three hospital-based studies found PN was associated with better patient satisfaction with cancer-related care [24, 25, 28]. The other studies were conducted in a combination of settings [30] or in outpatient clinics [23, 26, 27, 29], including outpatient radiology clinics [27], oncology practices [26], and community health centers [23].

In addition, three studies [23, 24, 26] were conducted in urban areas, one was conducted in a rural area [22], and the

geographic locations for four studies were not indicated [25, 27–29]. One study combined data from other studies conducted in both rural and urban locations [30]. Of three studies that reported that PN was associated with a higher level of patient satisfaction, one was conducted in an urban area [24] and the other two were conducted outside of the USA, in Korea and Canada [25, 28].

### Outcomes of patient navigation intervention on patient satisfaction

Of the nine included studies, three [24, 26, 29] were RCTs, including two studies that randomized participants to navigation or control at the individual level [24, 26], and one study in which randomization was conducted at the clinic level [29]. Five studies were non-randomized studies [22, 23, 25, 27, 28], and one pooled data from both RCTs and non-randomized studies in its analysis [30]. All of these studies assessed overall satisfaction with cancer care. In addition, three studies [23, 25, 27] used single item or subscale measures of specific aspects of satisfaction with cancer care, including time spent with a physician, technical quality, communication and interpersonal skills, and satisfaction with financial aspects of care.

**Overall satisfaction** Evaluation of the results of each specific study revealed that three studies reported higher overall satisfaction with cancer-related care among individuals who received PN compared to those who did not receive PN [24, 25, 28]. In contrast, five studies reported no statistically significant difference in overall satisfaction between PN and control groups [22, 23, 26, 27, 30]. Additionally, one study compared changes in patient satisfaction from the time of the identification of a potential cancer abnormality to within 180 days

of diagnostic resolution between individuals who received PN and those who received written cancer information plus usual care [29]. This study found no significant differences between the two groups in satisfaction with cancer care (Table 3) [29].

Five studies [22, 24, 25, 27, 28] provided adequate data to be included in a meta-analysis to evaluate whether receipt of PN was associated with higher overall satisfaction with cancer-related care (Fig. 3). Of these five studies, one was a RCT [24] and the other four [22, 25, 27, 28] were non-randomized controlled trials (non-RCTs). The standardized mean difference for the RCT was 2.30 (95% confidence interval 1.79, 2.80,  $p < 0.001$ ), indicating that participants in this study who received a PN intervention ( $n = 53$ ) were significantly more satisfied than those participants who did not receive PN ( $n = 49$ ) [24]. The pooled standardized mean difference for the four non-RCTs was 0.39 (95% confidence interval  $-0.02, 0.80$ ,  $p = 0.06$ ), indicating that patients who received PN ( $n = 241$ ) were not more satisfied than those who did not receive PN ( $n = 176$ ). Our analysis also revealed significant heterogeneity ( $I^2 = 73\%$ ;  $p < 0.001$ ) among the non-RCTs.

**Satisfaction with specific types of cancer-related care** The three studies that evaluated satisfaction with specific types of cancer-related care varied considerably in outcome assessments [23, 25, 27] making it impossible to group their reported outcomes in any meaningful way. Therefore, each study is described separately with respect to whether there were differences in satisfaction with specific aspects of cancer-related care between participants who did and those who did not receive PN.

In a study of women undergoing cancer-related breast biopsies, those who received care in an outpatient radiology clinic with nurse-delivered PN had similar satisfaction scores as those who did not receive PN on all PSQ-18 subscales: Technical Quality, Interpersonal Manner, Communication, Financial Aspects, Time Spent with Doctor, and Accessibility and Convenience [27]. Overall, satisfaction with care was relatively high across most subscales of the PSQ-18 for both PN and usual care groups [27].

A second study assessed satisfaction among women referred to a hospital breast center for follow-up after an abnormal mammogram showed that patients who received PN had similar levels of satisfaction as those who did not receive PN [23]. This study used multiple single-item measures of patient satisfaction that were dichotomized to indicate whether patients rated each item as “excellent” or “not excellent.” More than half of participants in both groups rated care as excellent in the following areas: staff communication regarding what to expect during exam, being treated with dignity and respect, staff respect for privacy, staff assistance with pain and discomfort, instructions about home care, the way doctors and nurses answered questions, concern staff showed for patient’s

concerns and worries, respect staff showed to family and friends, helpfulness of information, and communication between the breast center and patient’s primary care provider. Individuals who received PN were less likely to rate “staff concern for their cultural and religious beliefs and concerns” as excellent compared to individuals who did not receive PN [23].

The third study evaluating satisfaction with specific types of cancer-related care compared two cohorts of patients with head and neck cancer using the EORTC QLQ-SAT32 [33]. Patients who received PN reported significantly higher satisfaction with availability of doctors and nurses, interpersonal qualities of doctors, technical skills of doctors, doctors’ and nurses’ provision of information, and hospital waiting when compared to patients who did not receive PN [25]. Although there is not a nurse “psychosocial support” EORTC QLQ-SAT32 subscale [33], this study reported that individuals who received PN had more satisfaction with nurses’ “psychosocial support” than those who did not. There were no differences between patients who received PN and those who did not on satisfaction with the technical skills of nurses, hospital access, kindness, helpfulness, provision of information by hospital personnel, exchange of information with cancer care team, and comfort and cleanliness of hospital. Overall, this study found that patient satisfaction across specific aspects of care was relatively high across groups (cohorts that received PN and the cohort that did not) [25].

## Discussion

In the present study, we critically assessed and synthesized available evidence regarding the effect of PN on satisfaction with cancer care. Our systematic review of nine studies that included a total of 4210 participants who completed patient satisfaction surveys found that most studies demonstrated that PN had either a neutral effect (neither increased nor decreased) or a positive effect (increased) patient satisfaction with cancer-related care. Across studies, ratings of satisfaction with cancer care were either moderate or high, indicating patients were generally satisfied with their care, whether or not they received PN. Data from five studies pooled for meta-analysis revealed mixed findings. One RCT indicated that PN was effective in increasing patient satisfaction with cancer care [24], whereas the remaining four non-RCTs showed that PN was not effective in increasing patient satisfaction with cancer care [22, 25, 27, 28]. There was significant heterogeneity among the non-RCTs, with varying types of cancer care targeted, settings where PN was implemented, PN models, and measures of patient satisfaction. All studies included in the systematic review applied PN to improve outcomes related to cancer diagnostic care (i.e., diagnostic resolution) or treatment (e.g., timely initiation and completion of cancer care).

**Table 3** Comparison of Patient Navigation with Control on Patient Satisfaction with Cancer-related Care: Results from Individual Studies

Item/subscale/scale	PN sample size	PN mean	PN standard deviation	Control sample size	Control mean	Control standard deviation	Value of significance
Campbell (2010)							
Overall satisfaction with care received at cancer center	28	4.82	NA	16	4.12	NA	p = 0.207
Donelan (2010) <sup>a</sup>							
Item/subscale/scale	PN sample size <sup>b</sup>	% of PN patients rating “excellent”		Control sample size <sup>b</sup>	% of control patients rating “excellent”		
Overall quality of care	52–72	55%	NA	90–181	62%	NA	p = 0.294
The way staff explained what to expect	52–72	54%	NA	90–181	51%	NA	p = 0.702
Treated with dignity and respect	52–72	59%	NA	90–181	67%	NA	p = 0.236
Concern staff showed for privacy	52–72	58%	NA	90–181	65%	NA	p = 0.337
The concern the staff showed about your cultural and religious beliefs and customs	52–72	45%	NA	90–181	54%	NA	p = 0.014
The way staff helped pain and discomfort	52–72	42%	NA	90–181	55%	NA	p = 0.102
Instructions about how to care for yourself at home	52–72	58%	NA	90–181	57%	NA	p = 0.893
The way doctors and nurses answered questions	52–72	58%	NA	90–181	62%	NA	p = 0.586
Concern staff showed for concerns and worries	52–72	57%	NA	90–181	61%	NA	p = 0.658
Respect staff showed for family and friends	52–72	56%	NA	90–181	62%	NA	p = 0.467
Helpfulness of information about diagnosis and test results	52–72	53%	NA	90–181	56%	NA	p = 0.647
Communication between the Avon Breast Center and your primary care doctor or nurse	52–72	55%	NA	90–181	54%	NA	p = 0.956
Ferrante (2007)							
Mean satisfaction	53	4.30	0.50	49	2.90	0.70	p < 0.001
Fillion (2009)							
Overall satisfaction	75	90.70	13.70	83	85.50	16.70	p = 0.03
Doctors							
Availability	75	85.40	2.00	83	74.50	25.20	p = 0.002
Interpersonal qualities	75	87.40	17.10	83	79.80	21.60	p = 0.01
Technical skills	75	91.10	12.70	83	86.60	15.60	p = 0.03
Information provision	75	86.80	19.30	83	78.70	23.30	p = 0.02
Team							
Availability	75	85.40	18.60	83	79.40	21.70	p = 0.06
Psychosocial support <sup>c</sup>	75	89.30	15.60	83	83.60	13.40	p = 0.04
Technical skills	75	87.00	18.00	83	83.70	17.10	p = 0.16
Information provision	75	85.90	18.20	83	77.90	22.60	p = 0.01
Hospital							
Access	75	70.40	24.10	83	67.60	25.50	p = 0.54
Other hospital personnel kindness, helpfulness, and information giving	75	86.90	14.90	83	83.90	16.60	p = 0.17
Waiting time	75	85.60	17.50	83	77.20	22.20	p = 0.004
Exchange of information within the care team	75	81.20	21.50	83	77.30	19.60	p = 0.18
Comfort and cleanliness	75	78.80	21.20	83	76.60	21.50	p = 0.61
Harding (2014)							
Total PSQ-18	85	67.25	9.26	52	66.58	9.86	t = -0.401
Accessibility and convenience (subscale)	85	14.57	2.71	52	14.33	2.63	t = -0.528
Communication (subscale)	85	7.67	1.46	52	7.88	1.59	t = 0.805
Financial aspects (subscale)	85	6.75	1.63	52	6.44	1.82	t = -1.032
General satisfaction (subscale)	85	8.04	1.18	52	7.98	1.40	t = -0.244
Interpersonal manner (subscale)	85	8.16	1.26	52	7.81	1.99	t = -1.286
Technical quality (subscale)	85	14.87	2.47	52	14.77	2.53	t = -0.231
Time spent with doctor	85	7.45	1.46	52	7.44	1.49	t = -0.064

**Table 3** (continued)

Item/subscale/scale	PN sample size	PN mean	PN standard deviation	Control sample size	Control mean	Control standard deviation	Value of significance
Lee (2011) Level of satisfaction with cancer care (lower score indicates more satisfaction)	53	11.45	3.69	25	14.95	1.69	F = 11.85, p = 0.000
Post (2015) Baseline Satisfaction	416	82.12	NA	292	82.80	NA	NA
Mean increase in PSCC from baseline	416	3.26	NA	292	2.53	NA	p = 0.42

<sup>a</sup> Uses a 5-point scale of “excellent,” “very good,” “good,” “fair,” and “poor.” Significance tests were conducted comparing “excellent” vs. all other responses between patient navigation and control groups

<sup>b</sup> Sample size varies as respondents could indicate item did not apply to them (PN,  $n = 52$ – $72$ ; Control,  $n = 90$ – $181$ )

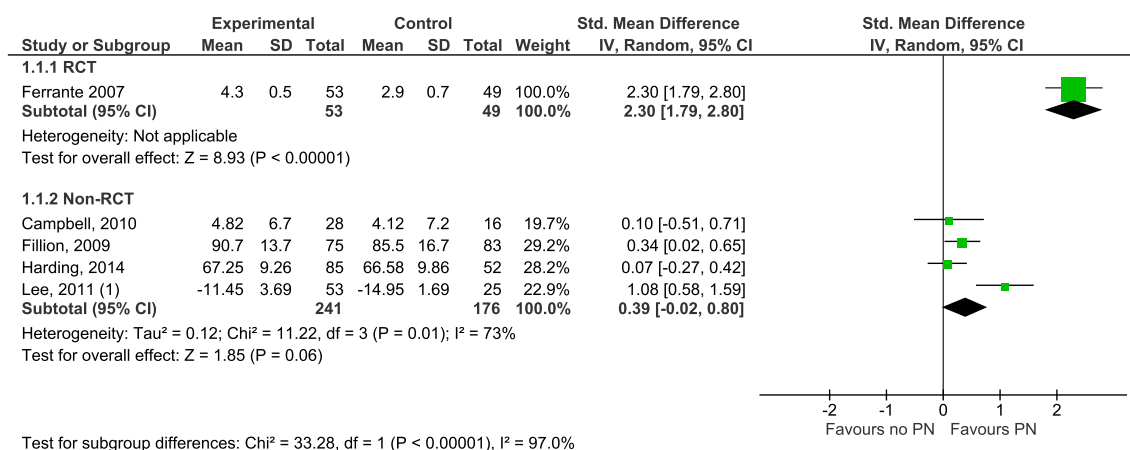
<sup>c</sup> Scale not included in EORTC-SAT 32 scoring manual

There were no studies evaluating whether PN improves satisfaction with cancer care related to screening, survivorship, genetic counseling, and recruitment and retention in clinical trials. There was significant variation in the methodological quality of the studies reviewed, with half of these studies rated as “weak,” due to limitations in the reporting of the studies. Many studies measured patient satisfaction with cancer-related care with patient satisfaction measures that were not psychometrically validated or reported administration or scoring of measuring using procedures that differed from standardized instructions. Additionally, our review only included one RCT in the meta-analysis [24] because the other single RCTs included in the present systematic review did not report adequate patient satisfaction data. Thus, poor reporting of patient satisfaction data in specific studies included in this review limited the ability to pool data from multiple RCTs and conduct any sensitivity analysis that may have been indicated.

To our knowledge, this study is the first comprehensive systematic review of cancer PN research focused on patient

satisfaction. Findings should be considered in light of the fact that PN is viewed as a standard of cancer care. Starting in 2015, the American College of Surgeons Commission on Cancer required that a PN process be in place in order to accredit cancer centers [35]. While PN is associated with improvements in cancer screening rates, adherence to follow-up care after abnormal cancer results, and timeliness of diagnostic resolution of a cancer-related abnormality [9–12], the present study indicates that additional research needs to be conducted regarding whether PN is effective in increasing patient satisfaction across the cancer care continuum and across different types of cancers.

The present systematic review includes certain limitations to be considered in its interpretation. First, this study is comprised only of published peer-reviewed manuscripts that assessed effectiveness of PN on patient satisfaction with cancer care. While unpublished studies were eligible for inclusion, none met inclusion criteria for this systematic review. Another limitation involves the inclusion of PN studies



#### Footnotes

(1) Reduction in scores was considered improvement unlike other studies where a increased score was considered better

**Fig. 3** Forest plot of comparison of patient navigation (experimental) versus control on overall satisfaction with cancer care

published in English only. As such, we may have missed relevant data from studies published in different languages. Similar to all systematic reviews, our findings are limited by data reported in the original studies we reviewed, and some studies we reviewed did not report data in a format that could be incorporated in the meta-analysis.

In conclusion, this systematic review revealed mixed data regarding whether PN is effective in increasing patient satisfaction with cancer-related care. All studies included in this review evaluated PN interventions designed to improve cancer diagnostic and treatment care. There were significant limitations in quality and reporting of data in the original studies we reviewed, which also limited the data available for meta-analysis. Our findings suggest that given the limitations in quality and scope of research on PN, well-designed and systematically implemented RCTs are needed to draw conclusions about the effects of PN on patient satisfaction with cancer-related care across the cancer care continuum.

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## References

- Wells KJ, Valverde P, Ustjanauskas AE, Calhoun EA, Risendal BC (2017) What are patient navigators doing, for whom, and where? A national survey evaluating the types of services provided by patient navigators. *Patient Educ Couns* 101:285–294. <https://doi.org/10.1016/j.pec.2017.08.017>
- Wells KJ, Nuhaily S (2018) Models of patient navigation. In: Calhoun E, Esparza A (eds) *Developing and implementing patient navigation programs*. Springer, New York, NY
- Hopkins J, Mumber MP (2009) Patient navigation through the cancer care continuum: an overview. *J Oncol Pract* 5:150–152
- Braun KL, Kagawa-Singer M, Holden AE, Burhansstipanov L, Tran JH, Seals BF, Corbie-Smith G, Tsark JU, Harjo L, Foo MA, Ramirez AG (2012) Cancer patient navigator tasks across the cancer care continuum. *J Health Care Poor Underserved* 23:398–413
- National Accreditation Program for Breast Centers (2014) NAPBC standards manual 2014 edition. American College of Surgeons, Chicago, IL
- Oncology Nursing Society, Association of Oncology Social Workers, National Association of Social Workers (2010) Oncology Nursing Society, the Association of Oncology Social Work, and the National Association of Social Workers joint position on the role of oncology nursing and oncology social work in patient navigation. *Oncol Nurs Forum* 37:251–252
- Freeman HP (2012) The origin, evolution, and principles of patient navigation. *Cancer Epidemiol Biomark Prev* 21:1614–1617. <https://doi.org/10.1158/1055-9965.EPI-12-0982>
- Genoff MC, Zaballa A, Gany F, Gonzalez J, Ramirez J, Jewell ST, Diamond LC (2016) Navigating language barriers: a systematic review of patient navigators' impact on cancer screening for limited English proficient patients. *J Gen Intern Med* 31:426–434. <https://doi.org/10.1007/s11606-015-3572-3>
- Paskett ED, Harrop JP, Wells KJ (2011) Patient navigation: an update on the state of the science. *CA Cancer J Clin* 61(4):237–249. <https://doi.org/10.3322/caac.20111>
- Wells KJ, Battaglia TA, Dudley DJ, Garcia R, Greene A, Calhoun E, Mandelblatt JS, Paskett ED, Raich PC, Program PNR (2008) Patient navigation: state of the art or is it science? *Cancer* 113: 1999–2010. <https://doi.org/10.1002/cncr.23815>
- Sunny A, Rustveld L (2016) The role of patient navigation on colorectal cancer screening completion and education: a review of the literature. *J Cancer Educ*. <https://doi.org/10.1007/s13187-016-1140-0>
- Robinson-White S, Conroy B, Slavish KH, Rosenzweig M (2010) Patient navigation in breast cancer: a systematic review. *Cancer Nurs* 33: 127–140. <https://doi.org/10.1097/NCC.0b013e3181c40401>
- Baik SH, Gallo LC, Wells KJ (2016) Patient navigation in breast cancer treatment and survivorship: a systematic review. *J Clin Oncol* 34:3686–3696. <https://doi.org/10.1200/JCO.2016.67.5454>
- Fiscella K, Ransom S, Jean-Pierre P, Cella D, Stein K, Bauer JE, Crane-Okada R, Gentry S, Canosa R, Smith T, Sellers J, Jankowski E, Walsh K (2011) Patient-reported outcome measures suitable to assessment of patient navigation. *Cancer* 117 (15, Suppl):3603–3617. doi:<https://doi.org/10.1002/cncr.26260>
- Pratt-Chapman M, Simon MA, Patterson AK, Risendal BC, Patierno S (2011) Survivorship navigation outcome measures: a report from the ACS patient navigation working group on survivorship navigation. *Cancer* 117(15 Suppl):3575–3584. <https://doi.org/10.1002/cncr.26261>
- Strusowski T, Sein E, Johnston D (2017) Academy of Oncology Nurse & Patient Navigators announces standardized navigation metrics. *Journal of Oncology Navigation & Survivorship*:8
- Reuters T (2016) EndNote, New York
- Pascoe GC (1983) Patient satisfaction in primary health care: a literature review and analysis. *Eval Program Plann* 6:185–210
- Wells KJ, Lee JH, Calcagno ER, Meade CD, Rivera M, Fulp WJ, Roetzheim RG (2012) A cluster randomized trial evaluating the efficacy of patient navigation in improving quality of diagnostic care for patients with breast or colorectal cancer abnormalities. *Cancer Epidemiol Biomark Prev* 21:1664–1672. <https://doi.org/10.1158/1055-9965.Epi-12-0448>
- Effective Public Health Practice Project (1988) Quality assessment tool for quantitative studies. *Effective Public Health Practice Project*, Hamilton
- Manager R (2014) The Cochrane collaboration. The Nordic Cochrane Centre, Copenhagen
- Campbell C, Craig J, Eggert J, Bailey-Dorton C (2010) Implementing and measuring the impact of patient navigation at a comprehensive community cancer center [corrected] [published erratum appears in *Oncol Nurs Forum* 2010 May;37:260]. *Oncol Nurs Forum* 37:61–68. doi:<https://doi.org/10.1188/10.ONF.61-68>
- Donelan K, Mailhot JR, Dutwin D, Barnicle K, Oo SA, Hobbrecker K, Percac-Lima S, Chabner BA (2011) Patient perspectives of clinical care and patient navigation in follow-up of abnormal mammography. *J Gen Intern Med* 26:116–122. <https://doi.org/10.1007/s11606-010-1436-4>
- Ferrante JM, Chen PH, Kim S (2008) The effect of patient navigation on time to diagnosis, anxiety, and satisfaction in urban minority women with abnormal mammograms: a randomized controlled trial. *J Urban Health* 85(1):114–124. <https://doi.org/10.1007/s11524-007-9228-9>



25. Fillion L, de Serres M, Cook S, Goupil RL, Bairati I, Doll R (2009) Professional patient navigation in head and neck cancer. *Semin Oncol Nurs* 25:212–221. <https://doi.org/10.1016/j.soncn.2009.05.004>
26. Fiscella K, Whitley E, Hendren S, Raich P, Humiston S, Winters P, Jean-Pierre P, Valverde P, Thorland W, Epstein R (2012) Patient navigation for breast and colorectal cancer treatment: a randomized trial. *Cancer Epidemiol Biomark Prev* 21:1673–1681. <https://doi.org/10.1158/1055-9965.epi-12-0506>
27. Harding M (2015) Effect of nurse navigation on patient care satisfaction and distress associated with breast biopsy. *Clin J Oncol Nurs* 19:E15–E20. <https://doi.org/10.1188/15.CJON.E15-E20>
28. Lee T, Ko I, Lee I, Kim E, Shin M, Roh S, Yoon D, Choi S, Chang H (2011) Effects of nurse navigators on health outcomes of cancer patients. *Cancer Nurs* 34:376–384. <https://doi.org/10.1097/NCC.0b013e3182025007>
29. Post DM, McAlearney AS, Young GS, Krok-Schoen JL, Plascak JJ, Paskett ED (2015) Effects of patient navigation on patient satisfaction outcomes. *J Cancer Educ* 30:728–735. <https://doi.org/10.1007/s13187-014-0772-1>
30. Wells KJ, Winters PC, Jean-Pierre P, Warren-Mears V, Post D, Van Duyn MA, Fiscella K, Darnell J, Freund KM (2016) Effect of patient navigation on satisfaction with cancer-related care. *Support Care Cancer* 24:1729–1753. <https://doi.org/10.1007/s00520-015-2946-8>
31. Hendriks AA, Oort FJ, Vrieling MR, Smets EM (2002) Reliability and validity of the Satisfaction with Hospital Care Questionnaire. *Int J Qual Health Care* 14:471–482
32. Jean-Pierre P, Fiscella K, Freund KM, Clark J, Darnell J, Holden A, Post D, Patierno SR, Winters PC (2011) Structural and reliability analysis of a patient satisfaction with cancer-related care measure: a multisite patient navigation research program study. *Cancer* 117: 854–861. <https://doi.org/10.1002/cncr.25501>
33. Bredart A, Mignot V, Rousseau A, Dolbeault S, Beauloye N, Adam V, Elie C, Leonard I, Asselain B, Conroy T (2004) Validation of the EORTC QLQ-SAT32 cancer inpatient satisfaction questionnaire by self- versus interview-assessment comparison. *Patient Educ Couns* 54:207–212. [https://doi.org/10.1016/S0738-3991\(03\)00210-6](https://doi.org/10.1016/S0738-3991(03)00210-6)
34. Marshall GN, Hays RD (1994) The patient satisfaction questionnaire short-form (PSQ-18). Rand, Santa Monica, CA
35. Commission on Cancer (2012) Cancer program standards: ensuring patient-centered care. American College of Surgeons