Should Patients Be Optimistic about Surgery?

Resolving a Conflicted Literature

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Abstract

Following surgery, some patients suffer distress, disappointment, regret, poor adjustment, and poor quality-of-life. Surgeons may define "success" based on objective clinical outcomes, but patients' perceptions of surgical success rely primarily on a comparison to their initial expectations. We review the literature on the relationship between patients' surgical expectations and psychosocial outcomes and attempt to resolve a conflict in the literature. Specifically, we propose that conflicting conclusions regarding the merits of optimism primarily stem from differing methodological approaches by researchers in the field. Studies that examine preoperative expectations in isolation typically conclude that optimism is positively associated with beneficial psychosocial outcomes. Studies that compare preoperative expectations to objective surgical outcomes typically conclude that optimistic, particularly unrealistic optimism, is associated with detrimental psychosocial outcomes. As a whole, the evidence strongly supports an association between optimistic expectations and positive psychosocial outcomes following surgery *if* those expectations are based in reality. If preoperative optimism ultimately turns out to be unrealistic, however, it is likely to be a postoperative liability.

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Should Patients Be Optimistic about the Outcomes of Surgery?

Resolving a Conflicted Literature

Patients undergo surgery for a variety of reasons including disease prevention, diagnosis, treatment, and symptom relief. Although surgical teams understandably focus their efforts toward the physiological outcomes of surgery, patients also face a host of potentially devastating psychosocial outcomes, including psychological distress (Lam & Fielding, 2007; Lam, Fielding, & Ho, 2004; Stanton et al., 1998), disappointment (Foster, Wadden, Vogt, & Brewer, 1997), regret (Burton, Wright, & Richards, 1979), poor adjustment and quality-of-life (Davidge et al., 2009; Stanton et al., 1998), and lack of motivation to adhere to medical recommendations (Leedham, Meyerowitz, Muirhead, & Frist, 1995). Certainly these psychosocial problems can be reduced by improving surgical outcomes and minimizing side effects, but can they also be mitigated when side effects are inevitable or when optimal surgical outcomes cannot be guaranteed? This paper reviews and critiques the literature on surgical expectations to argue that patients' expectations are clear and strong predictors of their postoperative experience, yet the association between expectations and psychosocial outcomes is complex. Specifically, we draw a distinction between studies that examine preoperative expectations in isolation, which typically conclude that optimism is beneficial, and studies that pit preoperative expectations against relevant surgical outcomes, which reveal a downside to unmitigated optimism.

Patient Expectations

Patients typically approach surgery with expectations about their likely surgical outcomes (e.g., pain reduction, speed of recovery, side effects). Surgeons may define "success" based on objective clinical outcomes, but researchers have noted that patients' perceptions of surgical success rely primarily on a comparison to their initial expectations (Burton, Wright, & Richards,

1979). In fact, unrealistically optimistic expectations are common in anticipation of surgery. Between 8% and 47% of prostate cancer patients in one study were unrealistically optimistic about functioning following prostatectomy, despite extensive preoperative counseling that targeted expectations (Wittmann et al., 2011). Studies of patients undergoing bariatric surgery for weight loss found that one-third of patients were unrealistic in their weight loss expectations (Walfish & Brown, 2006; Walfish & Brown, 2007), and a study of spinal surgery patients found that 19% had unmet expectations following surgery (Yee, Adjei, Do, Ford, & Finkelstein, 2008).

We would note that the focus of this paper is on specific expectations about one's likely postoperative outcomes, not a generally positive or hopeful attitude toward surgery or a dispositional tendency toward optimism. We return to this distinction later in the paper. We further distinguish between relatively positive expectations for a particular outcome (e.g., expecting relatively little postoperative pain, expecting a relatively quick recovery), which we refer to simply as *optimism* throughout the paper, and unrealistically optimistic expectations (i.e., *unrealistic optimism*). We use the terms *optimism* or *optimistic* in reference to a single prediction about a surgical outcome (e.g., anticipated degree of postoperative pain, predicted length of recovery), agnostic to the source of such optimism or how it compares to one's true surgical outcomes. Although the term *unrealistic optimism* can be defined and measured in several ways (Shepperd, Klein, Waters, & Weinstein, 2013), in the context of the surgical literature, we use it to refer to an unfavorable mismatch between patients' initial expectations and their ultimate outcomes (unrealistic absolute optimism, in the parlance of Shepperd et al., 2013). Here again, we use the term *unrealistic optimism* without implying a particular cause of the mismatch between expectations and outcomes, although later in the paper we discuss various ways unrealistic optimism might arise. These terms, and many others, have been used inconsistently in

the literature, and thus we define our use up front to minimize unnecessary confusion.

Conflicting Findings on the Consequences of Optimism

In light of the possibility that optimistic expectations about the outcomes of surgery might ultimately be unrealistic, should physicians and support providers encourage patients to be optimistic prior to surgery? Research on the psychosocial outcomes of patients undergoing surgery provides extensive evidence regarding the apparent consequences of patients' expectations for surgical outcomes. These studies include prospective and retrospective examinations of the relationships between expectations and psychological distress, satisfaction with surgery and surgical care, and postoperative quality-of-life. Within this research literature are two broad types of studies, which come to nearly opposite conclusions about the wisdom of optimism in the context of surgery. The first type, which we will refer to as *expectation-only studies*, assess expectations in isolation and do not consider how patients' expectations compare to their ultimate surgical outcomes. The second type, which we will refer to as *expectation-comparison studies*, compare patients' outcomes against their initial expectations and thus capture the degree to which expectations were unrealistically optimistic (or pessimistic), not simply the degree of initial optimism.

To illustrate, imagine two patients undergoing bilateral mastectomy following a diagnosis of breast cancer. One patient, whom we will call Mirian, is otherwise in excellent health and her physician said that she is likely to return to her daily routine within two weeks after surgery. The other patient, whom we will call Elaine, is in poor health. Her physician indicated that it may be a month or longer before she feels well enough to resume daily activities. Both Mirian and Elaine trust their physician, and thus Mirian expects to return to work in two weeks and Elaine expects to return to work in four weeks. One week after surgery, a researcher assesses Mirian

and Elaine's quality-of-life. Unsurprisingly, Mirian reports that her quality-of-life is considerably better than Elaine's.

An expectation-only study of these women would find that optimistic preoperative expectations about return-to-work time is positively associated with postoperative quality-of-life, perhaps concluding that patients should be optimistic about the speed with which they will return to work. However, as our hypothetical scenario makes clear, this conclusion would be quite misleading. It was not optimism that led to Mirian's good quality-of-life; instead, her apparently cheery optimism was simply a proxy for her objective likelihood of a quick recovery. Similarly, it was not pessimism that led to Elaine's poor quality-of-life; instead, her apparently gloomy pessimism was a proxy for her objective likelihood of a slow recovery. In contrast, an expectation-comparison study of Mirian and Elaine's surgery would include a critical piece of information that an expectation-only study would leave out: their actual return-to-work time. Presuming their recovery proceeded as anticipated by their physicians (i.e., Mirian much quicker than Elaine), an expectation-comparison study would reveal that both women's expectations were quite accurate and thus would appropriately find no association between optimism per se and postoperative quality-of-life. The following review and analysis of the literature will compare these two types of studies in an effort to draw conclusions about the current state of the research on surgical expectations.

Review strategy. The analysis presented in this paper is best characterized as a critical review. According to a taxonomy of review types developed by Grant and Booth (2009), critical reviews entail a thorough (but not necessarily exhaustive) overview of a research area, providing "an opportunity to 'take stock' and evaluate what is of value from the previous body of work" (p. 93). Critical reviews are narrative and conceptual rather than quantitative or systematic, and they

often serve to resolve conflicting findings or competing schools of thought—just as we attempt to do here with regard to the risks and benefits of optimism about one's likely surgical outcomes.

Although critical reviews need not entail a comprehensive literature search, we nonetheless provide an overview of our search process. A two-phase search strategy was used to identify studies relevant to this review. First, the authors worked with two graduate students and four research assistants over the course of several months to search PsycINFO, PubMed, and Google Scholar using combinations of keywords including expectation / expectations / optimism / expectancies and surgery / surgical / operation / procedure. Once all relevant papers were collected from this initial search, we combed the reference sections of those papers and reviews on relevant topics to identify papers that did not emerge in our search.

To be included in our review, papers had to: (a) be published in a peer-reviewed English-language journal from 1949 (the date MedLine began indexing) through 2016; (b) include either a measure of patients' preoperative expectations for surgical outcomes or a postoperative measure of the comparison between preoperative expectations and surgical outcomes, or both; (c) include at least one measure of postoperative psychosocial outcomes; and (d) report the strength and direction of the association between preoperative expectations and psychosocial outcomes or between expectation fulfillment (comparison between expectations and surgical outcomes) and psychosocial outcomes. We focus our critical review on the association between optimism and psychosocial outcomes (i.e., satisfaction, quality-of-life, mental health, adjustment, emotional states, and subjective assessments of functioning) in an effort to disentangle the relatively objective surgical outcomes that are the targets of patients' optimism (e.g., pain, general recovery, return to work, physical function, symptom reduction) from patients' subjective experience. Other reviews and individual studies have assessed effects of optimism on

objective health outcomes (for a review, see Mondloch, Cole, & Frank, 2001; see also Bruce et al., 2012. 2014; Powell et al., 2012; Ronaldson et al., 2014), although we suspect that the concerns raised in this paper may also be relevant to those findings. Nonetheless, we acknowledge that a similar analysis focused on more objective health outcomes could reach a different conclusion.

Book chapters, dissertations and theses, unpublished drafts, non-peer-reviewed studies, and conference proceedings were excluded, as were studies that included measures of relevant variables but did not report statistics for the relationship between those variables. We included only published papers in an effort to aim our critical review at the literature currently accessible by researchers and practitioners. All of the studies described below are summarized in Table 1. We did not formally evaluate the quality of the studies included in our analysis, consistent with a critical review approach, but the reader can reference Table 1 for information about sample size, study design, and other key methodological details that may speak to the robustness of a study's findings.

It should be noted that the studies included in this review vary broadly on a number of variables (e.g., surgery type, sample size, patient characteristics, assessment type) that would ideally be included as moderators in a systematic or quantitative review. However, our initial review of the relevant papers revealed that very few provided the necessary statistics to conduct a formal quantitative review (i.e., a meta-analysis). Furthermore, our analysis reveals that these variations in methodology are unrelated to variations in a given study's findings. Instead, the conclusion these papers draw ("optimism is beneficial" vs. "optimism is risky if it is unrealistic") is almost perfectly predictable from a single study characteristic: whether it is an expectation-only study or an expectation-comparison study. We return to this point later in the paper.

Expectation-only studies. In theory, expectation-only studies can be either prospective, asking patients about their expectations regarding surgical outcomes prior to the surgery and then assessing psychosocial outcomes after surgery, or retrospective, asking patients after surgery to recall their surgical expectations (those they held prior to surgery) and concurrently assessing psychosocial outcomes. However, our search uncovered only prospective studies in the expectation-only category. These studies use correlation or regression analyses to examine the bivariate relationship between preoperative expectations and postoperative psychosocial outcomes.

By and large, expectation-only studies support the benefits of optimism (cf. Keogh, Hughes, Ellery, Daniel, & Holdcroft, 2006; Medhta, Huber, & Sindwani, 2006; Mönestam & Wachtmeister, 1997; Oh, Yoon, Kim, & Kim, 2012). Optimistic expectations for recovery prior to surgery generally predict better quality-of-life outcomes, including greater psychological adjustment, faster return to work, "feeling better after surgery," and greater social and leisure functioning (for review, see Mondloch, Cole, & Frank, 2001).

Patients who have optimistic expectations prior to spine surgery are generally more satisfied (Carr et al., 2011; Gepstein, Arinzon, Adunsky, & Folman, 2006; Rönnberg et al., 2007; Toyone, Tanaka, Kato, Kaneyama, & Otsuka, 2005) and less disappointed (de Groot, Boeke, & Passchier, 1999) following the surgery, and report greater satisfaction (Iverson, Daltroy, Fossel, & Katz, 1998; although one study found lower satisfaction among optimistic patients, Soroceanu, Ching, Abdu, & McGuire, 2012) and health-related quality-of-life (Abbott, Tyni-Lenné, Hedlund, 2011). Similarly, optimistic expectations regarding anticipated recovery time predicted patient satisfaction after sciatica surgery (Lutz et al., 1999), and patients with more optimistic expectations reported greater perceived reintegration into their life's roles following

surgery for soft tissue carcinoma (Davidge et al., 2009).

In the context of joint replacement surgeries, patients who have more optimistic expectations for surgery to treat joints affected by osteoarthritis report less depression at follow-up (Orbell, Johnston, Rowley, Espley, & Davey, 1998), although one study found that more optimistic patients reported poorer health-related quality of life (Gonzalez Sáenz de Tejada et al., 2010). Optimistic expectations in the context of knee surgery are associated with less interference in social roles resulting from emotional difficulties (Engel, Hamilton, Potter, & Zautra, 2004), as well as greater satisfaction (Tashjian et al., 2007), quality of life (Henn, Tashjian, Kang, & Green, 2007; although one study found no relationship with quality of life, Oh, Yoon, Kim, & Kim, 2012), mental and emotional health, and participation in social and daily activities after rotator cuff repair surgery (Henn et al., 2007).

Patients who have optimistic expectations about open heart surgery report less anxiety and depression after surgery (Chunta, 2009) and greater satisfaction (Fitzgerald, Tennen, Affleck, & Pranksy, 1993). Optimistic preoperative expectations also predict better mood, adjustment, and quality-of-life in heart transplant patients (Leedham et al., 1995). Finally, patients who were more optimistic prior to hysterectomy were more satisfied with their recovery progress shortly after surgery (Jamison, Taft, O'Hara, & Ferrante, 1993); patients who were more optimistic prior to elective laparoscopic surgery for infertility investigation were less anxious, depressed, and irritable following surgery (Jamison, Parris, & Maxson, 1987); and patients undergoing oral surgery who were more optimistic about their recovery reported less anxiety after surgery (McCarthy, Lyons, Weinman, Talbot, & Purnell, 2003).

In sum, expectation-only studies overwhelmingly demonstrate a link between optimistic preoperative expectations and improved psychosocial outcomes following surgery, pointing to

the possibility that patients should embrace a positive outlook prior to surgery. However, as we review next, expectation-comparison studies paint quite a different picture.

Expectation-comparison studies. Similar to expectation-only studies, expectation-comparison studies can also be either prospective or retrospective. In prospective studies of this type, patients report their expectations regarding surgical outcomes prior to the surgery, and then after the surgery researchers assess their actual surgical outcomes as well as psychosocial outcomes. These studies then compare preoperative expectations with relevant postoperative outcomes (e.g., expected recovery time minus actual recovery time after surgery) and use this difference score to predict psychosocial outcomes or use regression analyses to predict psychosocial outcomes from preoperative expectations, controlling for relevant postoperative outcomes. Retrospective studies of this type typically ask patients how their surgical outcomes compared to their preoperative expectations and then use this patient-generated comparison to predict psychosocial outcomes (our search uncovered only one retrospective study).

In direct contrast to expectation-only studies, expectation-comparison studies reveal the risks of overly optimistic expectations. A negative discrepancy between preoperative expectations and relevant surgical outcomes predicted greater psychological distress and poorer adjustment following breast cancer surgery (Lam & Fielding, 2007; Stanton et al., 1998) and greater symptom-related bother following prostate cancer surgery (Symon et al., 2006).

Unfulfilled expectations were associated with dissatisfaction with outcomes from lumbar and cervical spine surgery (Iverson et al., 1998; Mannion, Kämpfen, Munzinger, Kramers-de Quervain, 2009; Mannion et al., 2009; Toyone et al., 2005) and with general dissatisfaction following rotator cuff repair (Tashjian et al., 2007). Hip replacement surgery patients who felt their expectations had not been fulfilled experienced greater distress, more regret, and worse

adjustment (Burton, Wright, & Richards, 1979), more disappointment (Haworth, Hopkins, Ells, Ackroyd, & Mowat, 1981), and lower levels of satisfaction (Anakwe, Jenkins, & Moran, 2011). Similarly, patients who felt their expectations had not been fulfilled following total hip or knee replacement surgery were less satisfied (Scott et al., 2012) and reported poorer health-related quality of life (Gonzalez Sáenz de Tejada et al., 2010).

Patients who felt that their expectations for carpal tunnel release surgery had not been fulfilled were less satisfied following surgery (Kadzielski et al., 2008), and patients whose expectations for epilepsy treatment surgery were unfulfilled reported poorer satisfaction with surgery and greater distress on measures of psychological and psychosocial functioning following surgery (Wheelock, Peterson, & Buchtel, 1998). Finally, unfulfilled expectations following cataract surgery also predicted lower satisfaction (Pager, 2004). In sum, expectation-comparison studies suggest that preoperative optimism is a risk factor for poor psychosocial outcomes following surgery, to the extent that these optimistic expectations prove to be unrealistic—a conclusion that stands in stark contrast to the optimism-promoting conclusion from most expectation-only studies.

Resolving the conflict. The current state of the literature provides little in the way of clear recommendations for patients preparing to undergo surgery. Expectation-only studies typically conclude that optimism is beneficial, which would suggest that patients should aim to be as optimistic as possible ("think positive!"). However, expectation-comparison studies make clear that *unrealistic* optimism (expecting something better than is reasonable to expect) is ultimately detrimental to patients' psychosocial outcomes. In fact, despite considerable variability in surgery type (15 types across 21 expectation-only studies, 8 types across 12 expectation-comparison studies), sample size (ranging from 29 to 298 in expectation-only

studies, *M* = 112, and from 32 to 850 in expectation-comparison studies, *M* = 221), study sample (including a broad range of nationalities and ages within both categories), expectations measures[1], and outcome measures[2], the only consistent predictor of a study's conclusion is whether it was an expectation-only or expectation-comparison study.

How can the conflicting findings from expectation-only and expectation-comparison studies be resolved? We argue that the conflict arises, at least in part, because expectation-only studies introduce a confound between perceived risk and objective risk of problematic surgical outcomes. That is, an optimistic expectation can arise in response to accurate information about a given patient's likely surgical outcomes (e.g., well-established base rates of side effects, objective characteristics of the patient or medical condition that increase or decrease risks), inaccurate information (e.g., risk information from unreliable internet sources, anecdotal evidence from other patients), or a combination of both. The source of a patient's optimism regarding surgical outcomes is key to predicting whether optimism is likely to benefit that patient (if optimism is largely based on accurate risk information) or harm that patient (if largely based on inaccurate risk information) in the wake of surgery. However, expectation-only studies cannot tease apart the sources of patients' optimism, and thus the apparent benefits of optimism in these studies are most likely a reflection of actual surgical outcomes rather than expectations per se, driven by patients whose optimism is grounded in reality.

Of course, our review revealed that expectation-comparison studies typically conclude

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[1]In expectation-only studies, 32% of analyses examined expectations for recovery, 29% general surgical outcomes, 14% pain, 14% functioning, 7% return-to-work, 4% other; in expectation-comparison studies, 6% examined expectations for recovery, 41% general surgical outcomes, 24% pain, 18% functioning, 12% other.

[2]In expectation-only studies, 28% of analyses examined satisfaction, 28% emotional state, 16% quality-of-life, 16% mental health, 12% other; in expectation-comparison studies, 47% examined satisfaction, 20% emotional state, 20% adjustment, 13% other.

that unrealistic optimism is associated with poorer psychosocial outcomes, not that optimism is benign. We suspect that most participants in both expectation-only and expectation-comparison studies are like Mirian and Elaine from our opening vignette, calibrating their expectations in light of objective risk information provided by their physicians. However, as noted earlier, a subset of surgical patients reject realistic predictions and embrace an unrealistically optimistic outlook, and others may be forming their expectations in good faith but find themselves in the unlucky position of facing surgical outcomes that are worse than any reasonable person could have anticipated. These patients are likely to be unpleasantly surprised by their surgical outcomes and thus report poorer psychosocial outcomes than their realistic counterparts. Combining the effects of realistic and unrealistic optimism would thus produce a net negative association between optimism and psychosocial outcomes in expectation-comparison studies, whereas the overall positive association in expectation-only studies is driven by the apparent but misleading positive relationship between optimism and psychosocial outcomes among realists like Mirian and Elaine.

Implications and Future Directions

As a whole, the evidence strongly supports an association between optimistic expectations and positive psychosocial outcomes following surgery *if* those expectations are based in reality. If preoperative optimism is unrealistic, however, it is likely to be a postoperative liability.

Where should the field go from here? Expectation-only studies cannot adequately test the consequences of preoperative expectations because they critically and irreparably confound perceived and objective risk, and thus we see little value in the publication of further such findings. In contrast, expectation-comparison studies avoid the confound between perceived and

objective risk, positioning them to provide far stronger evidence for optimal preoperative expectations. We therefore recommend that researchers seeking to identify predictors of patients' postoperative psychosocial state address not only preoperative expectations but also their comparison to relevant postoperative outcomes.

Of course, the finding that excessive optimism carries psychosocial risks is quite well-established in both the basic social psychological literature (Shepperd & McNulty, 2002; Sweeny & Shepperd, 2010; Sweeny, Reynolds, Falkenstein, Andrews, & Dooley, 2015; Zeelenberg, 1999) and in the literature on surgical expectations (see above). Replication and extension of these findings are worthy goals, and studies that systematically examine moderators of this effect (e.g., patient demographics, surgery type, facility type) would be highly beneficial going forward—although our analysis points to a fairly robust pattern of effects. At this point it seems reasonable to conclude that patients should aim for cheerful realism rather than unmitigated optimism in anticipation of surgery. The importance of embracing realism in this context may go beyond improving standard psychosocial outcomes such as depression. For example, if patients expect to recover more quickly than is realistic, they may not plan appropriately by scheduling time off work, coordinating childcare and help with daily activities, and even deciding whether surgery is a good idea at that time. Such complications may strain patients' emotional, physical, financial, and social resources and further exacerbate their health concerns.

Finally, we recommend that future studies provide the statistics necessary to extract effects sizes that can be used for meta-analysis. Although qualitative reviews are valuable, meta-analysis is a powerful tool for understanding the strength and robustness of the relationship between variables and identifying clinically-relevant moderators of the overall relationship. The consistency and breadth of the findings in our review confer confidence in our conclusions, but

future studies should endeavor to contribute to systematic and quantitative reviews.

Conclusion

The implications for education and practice are clear: Surgeons and other clinicians should exercise caution when encouraging patients to be optimistic about surgical outcomes. When base rates and patients' unique circumstances provide reason to expect the best, clinicians can and should communicate this hopeful state of affairs. However, when evidence suggests that patients may face a difficult recovery or that surgery may not be successful, clinicians should clearly communicate these expectations to patients and ensure that patients understand their likely outcomes. Of course, as noted earlier, a hopeful, positive attitude is clearly and importantly distinct from unrealistically optimistic expectations about measurable postoperative outcomes. In fact, considerable evidence supports the benefits of embracing an outlook that hopes for the best, seeks silver linings, and fights resignation and despair (e.g., Carver & Antoni, 2004; Reed, Kemeny, Taylor, Wang, & Visscher, 1994; Segerstrom, Taylor, Kemeny, & Fahey, 1998). Thus, clinicians and patients should strive to balance positivity with a dose of practicality, and hope with a dose of realism.

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Table 1

Summary of Expectation-Only and Expectation-Comparison Studies

Author(s)	Year	Surgery Type	*N*	Study Sample	Design	Expectations Measure	Psychosocial Outcome(s)	Conclusion
EXPECTATION-ONLY STUDIES								
Abbott et al.	2011	Lumbar fusion	107	Swedish adults	Prospective	Pain	Health-related QoL	Greater optimism = better health-related QoL
Carr et al.	2011	Anterior cervical discectomy and fusion	79	American adults	Prospective	Postoperative pain	Patient satisfaction	Greater optimism = greater satisfaction
Chunta	2009	Open-heart	54	American adults	Prospective	Return to work & regular activity	Anxiety, depression	Greater optimism = less anxiety and depression
Davidge et al.	2009	Extremity soft tissue carcinoma	157	Canadian adults	Prospective	Length of recovery, complications, activity performance	Perceived reintegration into life's roles	Greater optimism = greater reintegration into life's roles
de Groot et al.	1999	Lumbar	120	Dutch adults	Prospective	Pain and recovery	Disappointment	Greater optimism = less disappointment
Engel et al.	2004	Total knee replacement	62	American adults	Prospective	Probability of recovery	Interference in social roles	Greater optimism = less interference in social roles
Fitzgerald et al.	1993	Coronary artery bypass	49	American adults	Prospective	General surgical outcomes	Negative affect, life satisfaction	Greater optimism = greater satisfaction (no association with negative affect)
Gepstein et al.	2006	Lumbar spine	298	Israeli adults	Prospective	General surgical outcomes	Patient satisfaction	Greater optimism = greater satisfaction
Henn et al.	2007	Rotator cuff repair	125	American adults	Prospective	General surgical outcomes	QoL, mental and emotional health	Greater optimism = greater QoL & mental and emotional health

Author(s)	Year	Surgery Type	*N*	Study Sample	Design	Expectations Measure	Psychosocial Outcome(s)	Conclusion
Iversen et al.	1998	Lumbar spine	257	American older adults	Prospective	Physical function, pain, recovery time	Patient satisfaction	Greater optimism = greater satisfaction
Jamison et al.	1993	Hysterectomy	68	Female American adults	Prospective	Recovery time	Patient satisfaction	Greater optimism = greater satisfaction
Jamison et al.	1987	Elective laparoscopic	50	Female American adults	Prospective	General surgical outcomes	Anxiety, depression, irritability	Greater optimism = less anxiety, depression, and irritability
Keogh et al.	2006	Planned elective cesarean section	65	Female American adults	Prospective	Birth experiences	Post-surgical fear	No association between optimism and fear
Leedham et al.	1995	Heart transplantation	31	American adults	Prospective	General surgical outcomes	Mood, adjustment, QoL	Greater optimism = better mood, adjustment, & QoL
Lutz et al.	1999	Sciatica	273	American adults	Prospective	Recovery time	Patient satisfaction	Greater optimism = greater satisfaction
McCarthy et al.	2003	Oral	101	British adults	Prospective	Recovery	Psychological distress	Greater optimism = less distress
Mehta et al.	2006	Endoscopic sinus	29	American adults	Prospective	Recovery	Frustration, sadness	No association between optimism and frustration or sadness
Mönestam & Wachtmeister	1997	Cataract	52	Low-vision Swedish older adults	Prospective	General function	Patient satisfaction	No association between optimism and satisfaction
Oh et al.	2012	Rotator cuff repair	128	Korean older adults	Prospective	General surgical outcomes	QoL	No association between optimism and QoL
Orbell et al.	1998	Osteoarthritis	107	Scottish older adults	Prospective	General surgical outcomes	Depression	Greater optimism = less depression
Rönnberg et al.	2007	Lumbar disc herniation	148	Swedish adults	Prospective	Recovery, return to work	Patient satisfaction	Greater optimism = greater satisfaction

Author(s)	Year	Surgery Type	*N*	Study Sample	Design	Expectations Measure	Psychosocial Outcome(s)	Conclusion
EXPECTATION-COMPARISON STUDIES								
Anakwe et al.	2011	Total hip arthroplasty	850	Scottish older adults	Prospective	General surgical outcomes	Patient satisfaction	Unrealistic optimism = lower satisfaction
Burton et al.	1979	Total hip replacement	88	British adults	Retrospective	Deformity, mobility, postop care, pain	Regret, QoL	Unrealistic optimism = greater regret, poorer QoL
Haworth et al.	1981	Total hip replacement	145	British older adults	Prospective	Pain, daily activities	Disappointment	Unrealistic optimism = more disappointment
Kadzielski et al.	2008	Carpal tunnel release	49	American adults	Prospective	Symptom reduction	Patient satisfaction	Unrealistic optimism = lower satisfaction
Lam & Fielding	2007	Breast cancer	367	Female Chinese adults	Prospective	General surgical outcomes	Distress, social adjustment	Unrealistic optimism = greater distress and poorer adjustment
Mannion et al.	2009	Spinal	88	Swiss older adults	Prospective	General surgical outcomes	Patient satisfaction	Unrealistic optimism = lower satisfaction
Mannion et al.	2009	Total knee arthroplasty	112	Swiss older adults	Prospective	Recovery time, pain, daily activities	Patient satisfaction	Unrealistic optimism = lower satisfaction
Pager	2004	Cataract	121	Australian older adults	Prospective	General surgical outcomes	Patient satisfaction	Unrealistic optimism = lower satisfaction
Scott et al.	2012	Knee and hip arthroplasty	669	British adults	Prospective	General surgical outcomes	Patient satisfaction	Unrealistic optimism = lower satisfaction
Stanton et al.	1998	Breast cancer	76	Female American adults	Prospective	General surgical outcomes	Psychological adjustment	Unrealistic optimism = poorer adjustment
Symon et al.	2006	Prostate cancer	50	Male American older adults	Prospective	Health state	Symptom-related bother	Unrealistic optimism = greater symptom-related bother
Wheelock et al.	1998	Epilepsy	32	American adults	Prospective	General surgical outcomes	Patient satisfaction, distress, psychosocial adjustment	Unrealistic optimism = lower satisfaction, greater distress & poorer adjustment

Author(s)	Year	Surgery Type	*N*	Study Sample	Design	Expectations Measure	Psychosocial Outcome(s)	Conclusion
STUDIES INCLUDING EXPECTATION-ONLY AND EXPECTATION-COMPARISON ANALYSES								
Gonzalez Sáenz de Tejada et al.	2010	Total joint replacement	881	Spanish older adults	Prospective	General surgical outcomes	HRQoL	Optimism and unrealistic optimism = lower HRQoL
Soroceanu et al.	2012	Lumbar and cervical spine	402	Canadian adults	Prospective	General surgical outcomes	Patient satisfaction	Optimism and unrealistic optimism = lower satisfaction
Tashjian et al.	2007	Rotator cuff repair	112	American adults	Prospective	General surgical outcomes	Patient satisfaction	Optimism = greater satisfaction; unrealistic optimism = lower satisfaction
Toyone et al.	2005	Lumbar disc herniation or laminotomy for lumbar spine stenosis	98	Japanese adults	Prospective	Pain, numbness, mobility, daily activities	Patient satisfaction	Optimism = greater satisfaction; unrealistic optimism = lower satisfaction

Note: QoL = quality of life. All study samples were restricted to patients who were scheduled to undergo, or had already undergone, the relevant surgery. "General surgical outcomes" refers to either a broad composite of multiple outcome expectations or a single measure of expectations for broad surgical outcomes.