BMJ Open

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| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2018-023080 |
| Article Type: | Research |
| Date Submitted by the Author: | 03-Sep-2018 |
| Complete List of Authors: | Atlas, Alvin; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences; Capital Markets CRC Ltd, Health Market Quality Research<br>Milanese, Steve; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Grimmer, Karen; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Barras, Sarah; Australian Health Service Alliance<br>Stephens, Jacqueline; University of South Australia Division of Health Sciences, Centre for Population Health Research |
| Keywords: | health literacy, elective surgical procedures, scoping review, review, consumer health information |
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# SOURCES OF INFORMATION USED BY PATIENTS PRIOR TO ELECTIVE SURGERY: A SCOPING REVIEW

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**Short Title:** Elective surgery information sources

**Keywords:**

health literacy [MeSH]

electivesurgical procedures [MeSH]

review [MeSH]

scoping review

consumer health information [MeSH]

**Word Count (abstract)/limit:** 265/300

**Word count (text)/limit:** 4079/4000

**ABSTRACT**

**Objective:** To describe the range and nature of available research regarding sources of information that patients access, to inform their decisions about elective surgery.

**Design:** Scoping review.

**Methods:** Six scientific literature databases were searched: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS; focusing solely on elective surgery information sources oriented to patients. Web searches for grey literature were conducted in Google , South Australia Department of Health, Commonwealth Department of Health (Australia) and My Aged Care from the Department of Social Services (Australia). Included literature was described by National Health and Medical Council hierarchy of evidence, and data was extracted on country and year of publication, type of literature, who provided it and any information on end-users. Information sources were categorised by type and how information was presented.

**Results:** A pool of 1010 articles was reduced to 23 after screening for duplicates and non-relevant studies. Face-to-face exchanges were the most likely source of information prior to elective surgery (53.3% studies), followed by e-learning (26.6%), printed information (23%) and multimedia (16.6%) The face-to-face category included information provided by physician/general practitioners/specialists, and family and friends. Printed information included brochures and pamphlets, e-learning consisted of internet sites or videos, and the use of multimedia included different mixed media format.

**Conclusion:** There is considerable variability regarding the types of information patients use in their decision to undergo elective surgery . The most common source of health information (face to face interaction with medical personnel) raises the question that the information provided could be incomplete and/or biased, and dependent on what their health provider knew, or chose to tell them.

## ARTICLE SUMMARY

### Article focus

- To provide information on the sources of information patients used prior to elective surgery.
- To determine the scope of health information studies on elective surgery.

### Key messages

- There is a considerable variability with the sources of information patients used that influenced their decision to undergo elective surgery, with the face to face interaction with the doctors and specialist as the most common.

### Strengths and limitations of the study

- The scoping review helps to identify available evidence on the health information used by patients that could inform future research and healthcare practices.
- This scoping review represents a diverse sample of elective surgery procedures.
- There is a limited research on patient decision making for elective surgery procedures.
- Quality assessment of the included studies will not be conducted as this scoping review aims to provide a snapshot of the different sources of information used by patients prior to elective surgery by being inclusive of all types of information currently available.

## INTRODUCTION

Elective surgery is a term used to describe non-emergency surgery which is medically necessary, but which can be delayed for at least 24-hours.[1] There has been an increasing demand for elective surgery in Australia over the past decade, however the capacity of health systems to respond to has been limited by funding and workforce availability.[2]

In public hospitals there are generally constraints on resources (such as workforce training, workforce availability, operating theatres and beds).[3] Access to elective surgery is rationed through the use of waiting lists in which patients are assigned to urgency categories.[4] Elective surgery in public hospitals can be provided for people who have inadequate or no private health insurance, and who rely on Medicare funding for their health care. Medicare is the Australian universal public health insurance which pays standard fees for medical and hospital care for all Australian citizens and permanent residents.[5] In private hospitals, when privately funded patients register for elective surgery, waiting lists rarely exist because patients and/or their insurer(s) are paying the costs of surgery.

Data from the Australian Institute of Health and Welfare indicates that in 2014-2015, public hospitals admitted approximately 698,000 patients from elective surgery waiting lists.[6] Between 2010-2011 and 2014-2015, elective surgery admissions in public hospitals increased by 1.3%. Elective surgery admissions to private hospitals increased by an average of 3% per year between 2010-2011 and 2014-2015. This translates to an increase in private hospital elective surgery admissions from 1,279,501 (2010-2011) to 1,438,722 (2014-2015).[7]

Little is known about the impact of surgical waiting lists on patients, their families, workplaces or society. There is little consistency on how waiting time is defined and monitored, and little is understood on the social, financial anf health impact of waiting on patients.[8,9] Moreover , there is rarely a 'best choice' for the management of many health conditions.[10] Over 50% patients placed on an orthopaedic surgical waiting list of a large tertiary hospital were managed effectively without surgery, by early physiotherapy triage, education about their condition, and offering a range of conservative treatment options.[11] Ensuring that patients can make informed choices at the time of referral to an elective surgery waiting list might assist patients to engage more actively in treatment decisions.[12]

To be able to make the best decision regarding treatment options, patients require an adequate level of health literacy and comprehensive information sources. This should include information about their condition and all possible treatment alternatives, risks, and benefits.[13] Health literacy relates to patients and their families having the skills and supports to make considered decisions about their best health care options.[14] Compared with adequate health literacy, poor health literacy has been associated with increased rates of hospitalisations and greater use of emergency care, poorer ability to demonstrate taking medications appropriately, poorer ability to interpret labels and health messages, poorer knowledge among patients regarding their health conditions, poorer overall health status and higher risk of death among older people. [15,16]

Individuals' ability to access, understand and use information about their condition will influence the decisions they make, and actions they take, about treatment.[13,17] To support their health literacy, patients require readily accessible, clear, focused, useable and evidence-based information about their health condition, the available health care choices, and costs, risks and likely outcomes from each.[18]

However, little is known about how, why and where patients access health information.[19,20] In order to improve patient health literacy, more needs to be known regarding whether patients are utilising any of the information available to them in making health decisions regarding elective surgery, or what information sources are most readily accessed and valued. It has been suggested that despite the explosion of available information, patients may still receive care that is based more on their provider's habits and choices, than their own preferences.[21]

This scoping review was undertaken with the aim of describing the range and nature of available research concerning the sources of information that patients access to inform their choices about elective surgery, and how this information is used in their decision-making.

**METHODS**

The methodology was based on the framework outlined by Arksey and O'Malley,[22] and the recommendations made by Levac . [23] Scoping review phases comprised defining the research question, searching for relevant studies, selecting the studies relevant to the scoping question, charting the data, and collating, summarising and reporting the results. The only review phase which was not undertaken was the optional consultation phase, as this was not relevant to the review purpose.

**Defining the Research Question:**

This scoping review was guided by the research question: 'What are the sources of information that patients use to inform their decision to undergo elective surgery?'

**Identifying relevant studies:**

The liaison health librarian at the University of South Australia independently conducted the literature searches in April 2016, and these were checked again in April 2017. Only studies written in English were sought, and no publication date or study design restrictions were applied. Six scientific databases were searched: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS. Search queries were tailored to the specific requirements of each database (see supplementary file 1).

A grey literature search was undertaken to identify seminal documents regarding health literacy and patient choice, that may have been developed for purposes other than scientific peer-reviewed publications. Web searches for grey literature were conducted via Google (www.google.com); SA Department of Health (http://www.sahealth.sa.gov.au); Commonwealth Department of Health (http://www.health.gov.au); and the Department of Social Services My Aged Care (http://www.myagedcare.gov.au).

The search terms used included Medical Subject Headings (MESH), and words and phrases identified from preliminary reading. The reference lists of included studies and grey literature were also manually searched to identify additional papers not captured in the search. The new literature was collated using a snowball technique where new literature was counted once only.

**Selecting the literature:**

Studies were eligible for inclusion if they were scientific papers focused on elective surgery and patients' health literacy, and concerned with the sources of information influencing patients' decisions to undergo elective surgery. To standardise screening decisions, the inclusion criteria were developed into a questionnaire and used for a two staged screening process to determine the relevance of the literature.

For first stage screening, the title and abstract of citations were reviewed independently by two reviewers (AA, SM). Reviewers were not masked to author or journal name. To ensure reliability between reviewers, inter-rater reliability for study inclusion was calculated using percent agreement. Disagreements whether or not literature should be included for full review were resolved through discussion until consensus is reached.

Reviewers met throughout the screening process to resolve conflicts and discuss any uncertainties related to study selection.[23]

For second stage screening, all citations deemed potentially relevant after first stage screening were procured in full text. For articles that could not be obtained through institutional holdings available to the authors, attempts were made to contact the author or journal for assistance in procuring the article. Second stage screening used the same approach as the first stage screening. The same reviewers screened the full texts believed to be relevant to the search question, using the same questionnaire. Disagreements were resolved through discussion.

**Data extraction:**

To evaluate and present the findings, as many sources of information as possible were extracted from the included articles. As some articles included multiple sources of information, the overall totals in data categories often exceeded the number of studies. Data were extracted using standard forms and entered into Micrososft Excel tables by one reviewer (AA). Extracted data included study and population characteristics such as authors, year of publication, the study sample, the country in which the study took place, the study design and the study methodology used, the sources of information used prior to elective surgery and the type of elective surgery done. The study design was determined using the National Health and Medical Research Council (NHMRC) hierarchy of evidence.[24] Additional data were collected from randomised controlled trials (RCTs) including the primary outcome and statistical significance. The type of elective surgery was determined based on the surgical specialty as defined by the SA Health- Government of South Australia.[25] The tables were independently checked for accuracy by a second reviewer (SM), who randomly selected five research studies and checked the extracted data against the full text study. Disagreements were resolved through discussion. The information extracted that helped answer the research questions was discussed during meetings to generate an overall perspective on the factors emerging from the literature.

**Data summary and synthesis:**

The completed data extraction files were exported into STATA version 12[26] for descriptive analyses to summarize available data.[22] An essential step in the data summary process was regular author group discussion of the nuances in the extracted data to establish overall perspectives on the sources of information patients were reported to use prior to elective surgery. The information in the spreadsheet were color coded according to the different sources ofinformation used, in order to assist with organising the

reporting of the scoping review findings. Studies were grouped according to the source of information used prior to elective surgery, the study design and the the type of elective surgery done.

**Patient and public involvement**

The scoping review was done to describe the available research about the sources of information that patients use prior to elective surgery. Patients and the public were not involved in any stage of the scoping review process.

**RESULTS**

**Search findings:**

The search yielded 1010 potentially relevant citations. After removal of duplicates and irrelevant papers, 856 citations met the eligibility criteria based on title and abstract. These were obtained and full text screened, with 23 studies included in the analysis. The CONSORT diagram describing the article inclusion process is outlined in Figure 1.

**Study design and sample:**

The general characteristics of included literature are reported in Table 1. Of the 23 included studies, 65.3% (15/23) were published after 2009, and all were from developed countries. The majority of studies investigating sources of information prior to elective surgery occurred in UK, USA and Australia (15/23).

**Table 1: General characteristics of included studies (n=23)**

| Characteristic | Number (n=23) | Percentage (%) |
|---|---|---|
| Publication year | | |
| 2000 – 2004 | 3 | 13 |
| 2005 – 2009 | 5 | 21.7 |
| 2010 - 2015 | 15 | 65.3 |
| Location of the study | | |
| Australia | 6 | 26.1 |
| Canada | 1 | 4.3 |
| Finland | 1 | 4.3 |
| Netherlands | 3 | 13 |
| New Zealand | 1 | 4.3 |
| Sweden | 1 | 4.3 |
| Taiwan | 1 | 4.3 |

| | | |
|---|---|---|
| United Kingdom | 5 | 21.7 |
| United States of America | 4 | 17.4 |
| Study Design | | |
| Cross sectional | 10 | 43.7 |
| Randomized Controlled trial | 7 | 30.4 |
| Cohort | 2 | 8.7 |
| Descriptive | 1 | 4.3 |
| Phenomenological | 1 | 4.3 |
| Observational | 1 | 4.3 |
| Mixed Method | 1 | 4.3 |
| Elective Surgery Specialty * | | |
| General Surgery | 6 | 26.1 |
| Orthopaedics | 12 | 52.2 |
| ENT | 1 | 4.3 |
| Vascular surgery | 1 | 4.3 |
| Plastic surgery | 2 | 8.6 |
| Cancer related surgery | 1 | 4.3 |

*There were no studies reporting ophthalmology, neurosurgery, urology, gynaecology, thoracic surgery or craniofacial surgery.

Considering study design, 17 studies were quantitative, with cross sectional studies the most common design. The two qualitative studies used phenomenological and non-participant observation, and one study used a mixed method research design. Twelve studies involved patients who had undergone orthopaedic surgery (hip and knee arthroplasty, hip, knee and shoulder arthroscopy, back surgery and anterior cruciate ligament reconstruction). The remaining studies involved patients who had general surgery, ear, nose and throat (ENT) surgery, plastic surgery, or cancer related surgery.

**Sources of information based on the type of elective surgery:**

This review found that patients accessed a range of information sources during their decision-making process prior to underogoing elective surgery. The type of information used by patients is presented in Table 2.

General Surgery:

In four studies, in which the elective surgery type was not specified, the use of the internet, reliance on general practitioner (GP) or specialist-directed decisions, and influence of the family were the reported sources of information prior to elective surgery.

**Table 2: Sources of information used based on elective surgery specialty**

| Specialty | Information used prior to elective surgery |
|---|---|
| General surgery | Internet, family, physician, family and friends |
| Orthopaedics | Physician directed, family and friends, hospitals and health care providers, Internet, multimedia, printed educational material, online education resource |
| ENT | Physician (GP and specialist), internet, friends, |
| Plastic Surgery | Family and friends, media exposure, educational booklet, video based decision aid |
| Cancer related | Printed education materials |

Orthopaedic Surgery:

Hip, knee, back, and shoulder orthopaedic surgeries were reported in the largest percentage of included studies (12/19 (63%)). To facilitate shared-decision making processes, sources of information varied, such as the use of decision aids[27]; multimedia tools[28,29]; interactive videos and booklets[30]; online educational resources[31]; the internet[31-33] ; oral education[34]; written educational material[34] physician/surgeon[12,35-37]; and family and friends .[36,37]

Ear, Nose and Throat (ENT) Surgery:

There was one cross-sectional study on the information accessed by patients undergoing elective ENT surgery. Information sources included information supplied by the GP, specialist information, from preadmission clinics, self-obtained information from internet and friends, and information from the syrgery consent form. Information from the pre-admission clinic (8/10) and outpatient consultation (7.5/10)was perceived and rated as having the highest quality.[38]

Bariatric/Cosmetic/Plastic Surgery:

There are two studies about cosmetic/bariatric surgery.[39,40] The commonly-used sources of information were video-based decision aids,[39] educational booklets,[39] and family and friends and media exposure[40]. The use of high quality, video-based decision aids were shown to significantly improve knowledge of the risk and benefits before bariatric surgery. Patients were randomly assigned to review either a video-based decision aid or an educational booklet on bariatric surgery. Changes in patient decision quality were assessed using bariatric-specific measures of knowledge, values, and treatment preference after 3 months. Thus, it appears that decision aids may be an important adjunct to bariatric treatment decisions in the future. Information about the experiences of family and friends who had elective surgery increased the likelihood of women undergoing cosmetic surgery. This is due to the increased amount of information that the patient has access to, to clarify misinformation that may cause anxiety and indecisiveness.[41] Media exposure did not influence likelihood of cosmetic surgery for either sex.[40]

Other types of elective surgery:

Four papers reported health literature use for other types of elective surgery, which were colorectal surgery, coronary artery bypass graft/mitral valve replacements, and hernia repair and cholecystectomy. Video education was introduced as an adjunct to verbal information to prepare patients psychologically for elective colorectal surgery. The supplemental video education with oral and printed information was concluded to be better in preparing patients for surgery and in helping to improve their short term outcomes in the enhanced recovery programme.[42] Of the patients, 88% rated the video information provided as adequare with 28% finding the video very helpful and more useful than other forms of patient information.

Another study provided cardiac surgery patients with a 24 page booklet to educate them on their operation, what to expect post-surgery, activity restrictions and recommendations for a safe discharge home. A survey was designed to elicit responses regarding patients' experiences of both preoperative written information received and post-operative services they received from occupational therapy while in acute care. Overall, patients were satisfied with the pre-operative cardiac surgery education provided in the written format booklet and believed that this adequately prepared them for surgery.[43]

A third study established the proportion of patients undergoing elective hernia repair or cholecystectomy, who searched the internet for information about their operations, in addition to receiving counselling and standard information at pre-admission clinics.[44] Of the patients, 59% had internet access with 79% of those with access searching for further information about their procedure on the internet. Patients who completed a questionnaire on the morning of their operation regarding their preparation for the operation in terms of health knowledge rated the information they had received as 'very good' or 'good'. However,

there was considerable variability in the standard information regarding surgical treatment options and surgical complications, and this resulted into 26% patients feeling confused or worried.[45] Printed education materials used on patients with colorectal cancer undergoing elective surgery were rated as adequate by patients, but did not satisfy their demands or information needs.[45] In fact, there were demands for more information tailored to the level of patients' health literacy and information needs. Printed education materials adapted to individual patient needs has been shown to improve patient recovery during the first year following colorectal cancer surgery.[46]

**Information sources categorisation**

The different sources of information identified in this review were further categorised, based on the source of health information, as shown in Table 3. The total number of sources of information is greater than the number of studies, since some studies reported multiple sources of information used. 'Hard copy' includes pamphlets, booklets, brochures, written educational and information materials and newspapers. Internet, patient education and interactive videos, online education were categorised under E –learning. Face-to-face includes GP/physician and specialist, healthcare provider, social network such as family, friends, acquaintances and hospital employees. Combinations of the different sources of information such as multimedia tools or decision aids were categorised as 'mixed'.

**Table 3: Source of health literature used by consumers.**

| Information type | Number of studies | Percentage | Published papers |
|---|---|---|---|
| Hard copy literature | 7 | 23.3 | Smith et al (2013), O'Brien et al (2013), Johansson et al (2007), Georgalas et al (2008), Deyo et al (2011), Corniou et al (2011), Arterburn et al (2012) |
| e-learning | 8 | 26.6 | Proude et al (2004), Tamhankar et al (2009), Ihedioha et al (2013), Fraval et al (2015), Fraval et al (2012), Deyo et al (2011), Brunnekreef & Schreurs (2011) |
| Mixed sources | 5 | 16.6 | Moser et al (2012), Johansson et al (2007), Corniou et al (2011), Arterburn et al (2012), Batuyong et al (2014) |
| Face to face | 10 | 33.3 | Ankuda et al (2014), Moser et al (2012), Mckeague & Windsor (2003), Lin et al (2012), Hawker et al (2015), Georgalas et |

| | | | |
|---|---|---|---|
| | | | al (2008), Gooberman-Hill et al (2010), Fraval et al (2015), Brown et al (2007), Ankuda et al (2014) |

Of the ten studies which reported face-to-face interaction as the commonly-used information exchanges, consultation with the physican was the most common source of information for patients, which was believed to promote shared decision-making. Shared decision-making offers a process which can help a physician and patient move beyond passive informed consent to a more collaborative, patient-centered experience. It reduces conflict and improves the quality of the decision for patients who are making choices about elective surgery.[12] One of the most important predictors of willingness to undergo elective surgery such as orthopaedic procedures, is having previously discussed this procedure with a physician, emphasizing the importance of the patient-physician interaction in patients' decision-making regarding surgery and medical care.[47,48] In the study by Ankuda et al (2014), while most patients (55%) reported shared-decision making with their surgeon, 36% reported patient-driven decision making and another 9% reported physician-driven decision making.[49] Patients saw clinicians as occupying expert roles and they deferred to clinicians' expertise. There was also evidence that patients modified their behaviour within consultations to complement that of clinicians.[35]

Opinions and experiences of family and friends are reported to have significant influence over patients deciding to undergo elective surgery.[50] This appears particularly relevant to cosmetic surgery. There is an increase in the number of people considering elective cosmetic surgery, possibly due to increased media attention and that many people personally know someone who had elective cosmetic surgery .[41] The experiences and information from family and friends were considered as reliable and accurate resulting in greater acceptance of the procedure and increasing likelihood of people undergoing cosmetic surgery in the future.[51] This societal trend may increase knowledge of, and familiarity with, cosmetic surgery and patients undergoing cosmetic surgery.[43,52]

## DISCUSSION

This scoping review provides the first synthesis of systematically-sourced information that describes the types, and ways, in which people access information to inform their decisions about elective surgery. The body of evidence consists of 23 studies, including seven randomised controlled trials, with the remainder lower level hierarchy observational studies. These described a range of evidence sources which patients

have been reported to use, to inform their choices for elective surgery for a range of health conditions. Whilst this review highlights research interest in the developed world regarding this topic, there was no research found from developing countries.

The most common source of information was doctors, specifically hospital consultants/specialists and general medical practitioners.[49] This review found that patients were generally satisfied with the information they received from their GP. They saw doctors as occupying expert roles, thus they defered to their expertise.[36] However, some studies reported that patients later stated that they had not raised disagreements or misgivings with doctors (particularly surgeons), and some expressed surprise about the decisions that were made on their behalf.[53] Patients might modify their behaviour in order to better match it to the styles of their medical practitioners, and that this may manifest itself as deference to the doctor's expertise during consultations.[54] This raises the question of potential power imbalance between medical practitioners and patients, which may also be sustained by differential awareness of the importance of role and communication in medical decision-making.[35]

The studies appeared to report an increasing trend wherein patients relied on health information coming from outside the healthcare environment, and their medical practitioners.[38,55-56] Doctors should not be threatened by this, and instead they must acknowledge that guiding patients to other sources (self-help groups, internet sites, organizations) may be as important as time actually spent talking to them. Recognising this creates a common language with the patient and can help to bypass any feelings of antagonism.[38]

The role of family and friends cannot be overestimated. As this review found, they have critical influences on patients' health decision-making. Family members played an important role in medical decision-making for elective surgery, which could enhance or restrict individual patient autonomy during the decision making process. Family members may include spouse, parents or adult children. Patients were aware that their suffering affected both themselves and their family, and they considered the primacy of the family in their treatment decisions, including compromising or agreeing to surgery to allay family anxiety or concerns.[49] Family was identified in this review as informant information brokers, where family members can become even more informed than patients. Thus the family can provide an important communication channel between medical practitioners and patients particularly if decision-making is complex.[49,57] Family members can also act as patient advocates by defending the interests of the patient during consultations, and in the surgery decision-making process. Thereby, patients and their families can act constructively as co-agents in healthcare decision-making, and in ongoing interactions with medical professionals.[49]

The use of internet as a source of health information is rapidly growing.[19,58-59] There were approximately 13.3 million internet subscribers in Australia at the end of June 2016. Thus the number of households with access to the internet at home has steadily increased in the recent past, reaching 7.7 million in 2014–15, and representing an increase of 3% from 83% in 2012–13.[60] Patients who were more likely to use the internet were younger, better educated and employed.19 According to a study by Wong et al, out of the 2944 study participants, 28.1% had sought health information online and 17.1% had obtained information related to problems managed by the GP at that visit. The use of internet and online health information was inversely associated with age.[61] The most socioeconomically advantaged patients were significantly more likely to have obtained health information online. Disseminating health and medical information on the internet can improve knowledge transfer from health professionals to the population, and help patients to maintain and improve their health.[62] However, this is a largely unregulated source of information, thus there are reasonable concerns on the quality of health information available on the internet.[63] Information provided on the internet can be incomplete or based on insufficient scientific evidence, and moreover, the internet information can be overwhelming, conflicting and confusing.[59,64]

Other sources of information can be categorised as decision aids. These typically include brochures or pamphlets, videos or websites that can present factual information about a condition, authored by reputable sources. These information sources often present health information in plain, easy-to-understand language; describe alternative treatments; and provide information about risks and benefits associated with treatment options. Studies have shown that decision aids consistently increase patients' knowledge; improve treatment expectations; increase active participation in decision-making; reduce decisional conflict or uncertainty about the appropriate course of action; decrease the proportion of people remaining undecided about treatment; and help patients reach decisions that are closely aligned with their stated values. The studies also suggest that the use of decision aids is associated with 25% fewer patients electing to have surgery.[10] The consistent use of patient decision aids may reduce the rates of elective surgery, and lower healthcare costs.[27] The use of multimedia aids (computer based, patient controlled interactive educational tool) has been reported to have a significant effect on knowledge transfer and patient learning.[33] These aids are an adjunct to physician-patient encounters and not a substitute for them.[66] The use of multimedia programs developed specifically for pre-admission use provides patients with opportunities to access detailed, high-quality information regarding their upcoming surgery, combined with pertinent details of their hospitalization and treating physician. Multimedia tools assist patients to determine exactly how much, and the depth of, information they receive. Information about the development of the disease and alternative therapies can be presented in detail; in the program, patient and the patients have access to accurate information regarding alternatives, self-help groups, and even comments from other patients. The

use of multimedia tool can reduce the communication gap between doctor and patient by giving patients the chance to educate themselves about the upcoming operation.[29,66-67] In the presence of multiple sources of health information, the challenge is how it can be tailored to deliver information specific to patients' needs.

**CONCLUSION**

This review indicated considerable variability in the types of information patients use in their decision to undergo elective surgery. Face-to-face interaction remainsl the most common source of patient health information prior to making choices about elective surgery. This can come from consultation with GP/specialist, and information from family and friends. Many atients consider the GP/specialist as experts and family/friends as adviocates on their behalf. Other sources of health information such as the use of multimedia and decision aids have a positive effect on knowledge translation to the patient. This provides relevant evidence-based information to facilitate shared decision making processes between patient and doctors.

It is increasingly recognised that patients require sound, sufficient information if surgery is to be effective. Having accesses to multiple sources of information can increase patients' control over heathcare choices regarding elective surgery, and can make a positive contribution to recovery.

**Acknowledgements**

None

**Funding**:

This work was conducted as part of PhD candidature funded by a scholarship grant by the Capital Markets Cooperative Research Centre and the Australian Health Service Alliance.

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**Figure Legend**

Figure 1: Search strategy and results

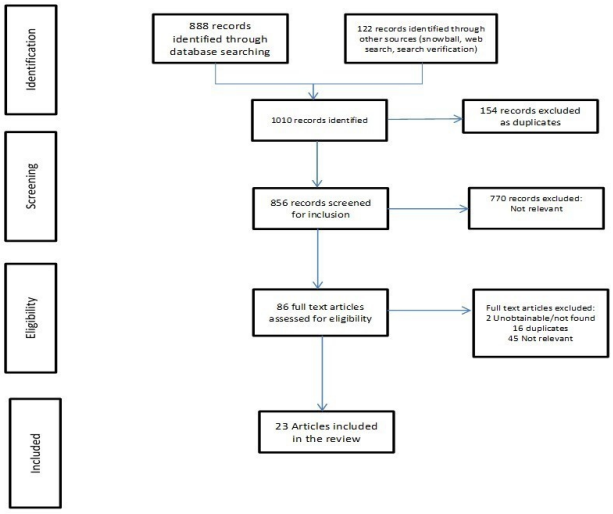


Figure 1. Search Strategy and results

Figure 1: Search strategy and results

338x190mm (96 x 96 DPI)

Search Terms

A. Electronic databases

| Database/platform | MEDLINE/PubMed |
|---|---|
| Date coverage | Generally 1946 to present |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | “health literacy” OR “patient education” OR “decision making” OR “choice behaviour“ OR “motivation” AND “elective surgery” OR “elective surgical procedure” OR non emergency surgery” |

| Database/platform | EMBASE |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | Non emergency surgery/ or Elective Surgical Procedures/ or elective surg*.mp. AND (orthopedics or orthopedic procedure$ or orthopaedic or arthroplasty).mp.<br>AND<br>educational status/ or health literacy/ or health status/ or patient education.mp OR personal autonomy/ or motivation/ or patient/ or satisfaction/ or decision making/<br>OR (source$ adj2 inform*).mp. |

| Database/platform | CINAHL |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (EBSCO) |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

| Database/platform | SCOPUS |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | In: “Article Title, Abstract, Keywords” |
| Search query | ( ( ( TITLE-ABS-KEY ( "elective surgery" ) OR TITLE-ABS-KEY ( elective surgical procedures ) OR TITLE-ABS-KEY ( non emergency surgery ) ) ) AND ( ( TITLE-ABS-KEY ( orthopedics ) OR TITLE-ABS- |

| | |
|---|---|
| | KEY ( orthopedic procedure$ ) OR TITLE-ABS-KEY ( orthopaedic ) ) ) ) AND ( ( ( TITLE-ABS-KEY ( educational status ) OR TITLE-ABS-KEY ( health literacy ) OR TITLE-ABS-KEY ( health status ) OR TITLE-ABS-KEY ( patient education ) ) ) OR ( TITLE-ABS-KEY ( sources information ) ) ) |

| | |
|---|---|
| Database/platform | Academic Search premier |
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

B. Web search and websites

| | |
|---|---|
| Website | Google<br>South Australia Department of Health<br>Commonwealth Department of Health<br>Department of Social Services My Aged Care |
| URL | https://www.google.com.au<br>https://www.sahealth.sa.gov.au<br>https://www.health.gov.au<br>https://www.myagedcare |
| Limits | Verbatim |
| Search query | “health literacy” AND “elective surgery” |

BMJ Open

# SOURCES OF INFORMATION USED BY PATIENTS PRIOR TO ELECTIVE SURGERY: A SCOPING REVIEW



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|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2018-023080.R1 |
| Article Type: | Research |
| Date Submitted by the Author: | 10-Apr-2019 |
| Complete List of Authors: | Atlas, Alvin; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences; Capital Markets CRC Ltd, Health Market Quality Research<br>Milanese, Steve; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Grimmer, Karen; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Barras, Sarah; Australian Health Service Alliance<br>Stephens, Jacqueline; University of South Australia Division of Health Sciences, Centre for Population Health Research |
| Primary Subject Heading: | Surgery |
| Secondary Subject Heading: | Health informatics |
| Keywords: | health literacy, elective surgical procedures, scoping review, review, consumer health information |
| | |

# SOURCES OF INFORMATION USED BY PATIENTS PRIOR TO ELECTIVE SURGERY: A SCOPING REVIEW

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**Short Title:** Elective surgery information sources

**Keywords:**

health literacy [MeSH]

electivesurgical procedures [MeSH]

review [MeSH]

scoping review

consumer health information [MeSH]

**Word Count (abstract)/limit:** 265

**Word count (text)/limit:** 4222

**ABSTRACT**

**Objective:** To describe the range and nature of available research regarding sources of information that patients access, to inform their decisions about elective surgery.

**Design:** Scoping review.

**Methods:** Six scientific literature databases were searched: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS; focusing solely on elective surgery information sources oriented to patients. Web searches for grey literature were conducted in Google , South Australia Department of Health, Commonwealth Department of Health (Australia) and My Aged Care from the Department of Social Services (Australia). Included literature was described by National Health and Medical Council hierarchy of evidence, and data was extracted on country and year of publication, type of literature, who provided it and any information on end-users. Information sources were categorised by type and how information was presented.

**Results:** A pool of 1039 articles was reduced to 26 after screening for duplicates and non-relevant studies. Face-to-face exchanges were the most likely source of information prior to elective surgery (55.6% studies), followed by e-learning (51.9%), printed information (51.9%) and multimedia (14.8%) The face-to-face category included information provided by physician/general practitioners/specialists, and family and friends. Printed information included brochures and pamphlets, e-learning consisted of internet sites or videos, and the use of multimedia included different mixed media format.

**Conclusion:** There is considerable variability regarding the types of information patients use in their decision to undergo elective surgery . The most common source of health information (face to face interaction with medical personnel) raises the question that the information provided could be incomplete and/or biased, and dependent on what their health provider knew, or chose to tell them.

**Strengths and limitations of the study**

- The scoping review was conducted to identify available evidence on the health information used by patients that could inform future research and healthcare practices.
- This scoping review represents a diverse sample of elective surgery procedures.
- There is a limited research on patient decision making for elective surgery procedures.
- Quality assessment of the included studies will not be conducted as this scoping review aims to provide a snapshot of the different sources of information used by patients prior to elective surgery by being inclusive of all types of information currently available.

## INTRODUCTION

Elective surgery is a term used to describe non-emergency surgery which is medically necessary, but which can be delayed for at least 24-hours.[1] There has been an increasing demand for elective surgery in Australia over the past decade, however the capacity of health systems to respond to has been limited by funding and workforce availability.[2]

In public hospitals there are generally constraints on resources (such as workforce training, workforce availability, operating theatres and beds).[3] Access to elective surgery is rationed through the use of waiting lists in which patients are assigned to urgency categories.[4] Elective surgery in public hospitals can be provided for people who have inadequate or no private health insurance, and who rely on Medicare funding for their health care. Medicare is the Australian universal public health insurance which pays standard fees for medical and hospital care for all Australian citizens and permanent residents.[5] In private hospitals, when privately funded patients register for elective surgery, waiting lists rarely exist because patients and/or their insurer(s) are paying the costs of surgery.

Data from the Australian Institute of Health and Welfare indicates that in 2014-2015, public hospitals admitted approximately 698,000 patients from elective surgery waiting lists.[6] Between 2010-2011 and 2014-2015, elective surgery admissions in public hospitals increased by 1.3%. Elective surgery admissions to private hospitals increased by an average of 3% per year between 2010-2011 and 2014-2015. This translates to an increase in private hospital elective surgery admissions from 1,279,501 (2010-2011) to 1,438,722 (2014-2015).[7]

Little is known about the impact of surgical waiting lists on patients, their families, workplaces or society. There is little consistency on how waiting time is defined and monitored, and little is understood on the social, financial anf health impact of waiting on patients.[8,9] Moreover , there is rarely a 'best choice' for the management of many health conditions.[10] Over 50% patients placed on an orthopaedic surgical waiting list of a large tertiary hospital were managed effectively without surgery, by early physiotherapy triage, education about their condition, and offering a range of conservative treatment options.[11] Ensuring that patients can make informed choices at the time of referral to an elective surgery waiting list might assist patients to engage more actively in treatment decisions.[12]

To be able to make the best decision regarding treatment options, patients require an adequate level of health literacy and comprehensive information sources. This should include information about their condition and all possible treatment alternatives, risks, and benefits.[13] Health literacy relates to patients and their families having the skills and supports to make considered decisions about their best health care options.[14] Compared with adequate health literacy, poor health literacy has been associated with increased rates of hospitalisations and greater use of emergency care, poorer ability to demonstrate taking medications appropriately, poorer ability to interpret labels and health messages, poorer knowledge among patients regarding their health conditions, poorer overall health status and higher risk of death among older people. [15,16]

Individuals' ability to access, understand and use information about their condition will influence the decisions they make, and actions they take, about treatment.[13,17] To support their health literacy, patients require readily accessible, clear, focused, useable and evidence-based information about their health condition, the available health care choices, and costs, risks and likely outcomes from each.[18]

However, little is known about how, why and where patients access health information.[19,20] In order to improve patient health literacy, more needs to be known regarding whether patients are utilising any of the information available to them in making health decisions regarding elective surgery, or what information sources are most readily accessed and valued. It has been suggested that despite the explosion of available information, patients may still receive care that is based more on their provider's habits and choices, than their own preferences.[21]

Access to health information is essential in the shared decision making (SDM) process between the patients and healthcare practitioners. SDM involves collaboration between the patient and the practitioner to discuss treatment options, ensures that the patient is adequately informed, and decides on the care options taking into consideration the patient's principles and preferences.[22] Patient participation in SDM with their health practitioner is higher when they know their treatment, screening or diagnostic procedure options. [23]

This scoping review was undertaken with the aim of describing the range and nature of available research concerning the sources of information that patients access to inform their choices about elective surgery, and how this information is used in their decision-making.

## METHODS

The methodology was based on the framework outlined by Arksey and O'Malley,[24] and the recommendations made by Levac.[25] Scoping review phases comprised defining the research question, searching for relevant studies, selecting the studies relevant to the scoping question, charting the data, and collating, summarising and reporting the results. The only review phase which was not undertaken was the optional consultation phase, as this was not relevant to the review purpose.

### Defining the Research Question:

This scoping review was guided by the research question: 'What are the sources of information that patients use to inform their decision to undergo elective surgery?'

### Identifying relevant studies:

The liaison health librarian at the University of South Australia independently conducted the literature searches in April 2016, and these were checked again in February 2019. Only studies written in English were sought, and no publication date or study design restrictions were applied. Six scientific databases were searched: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS. Search queries were tailored to the specific requirements of each database (see supplementary file 1).

A grey literature search was undertaken to identify seminal documents regarding health literacy and patient choice, that may have been developed for purposes other than scientific peer-reviewed publications. Web searches for grey literature were conducted via Google (www.google.com); SA Department of Health (http://www.sahealth.sa.gov.au); Commonwealth Department of Health (http://www.health.gov.au); and the Department of Social Services My Aged Care (http://www.myagedcare.gov.au).

The search terms used included Medical Subject Headings (MESH), and words and phrases identified from preliminary reading. The reference lists of included studies and grey literature were also manually searched to identify additional papers not captured in the search. The new literature was collated using a snowball technique where new literature was counted once only.

### Selecting the literature:

Studies were eligible for inclusion if they were scientific papers focused on elective surgery and patients' health literacy, and concerned with the sources of information influencing patients' decisions to undergo

elective surgery. To standardise screening decisions, the inclusion criteria were developed into a questionnaire and used for a two staged screening process to determine the relevance of the literature.

For first stage screening, the title and abstract of citations were reviewed independently by two reviewers (AA, SM). Reviewers were not masked to author or journal name. Disagreements whether or not literature should be included for full review were resolved through discussion until consensus is reached. Reviewers met throughout the screening process to resolve conflicts and discuss any uncertainties related to study selection.[25]

For second stage screening, all citations deemed potentially relevant after first stage screening were procured in full text. For articles that could not be obtained through institutional holdings available to the authors, attempts were made to contact the author or journal for assistance in procuring the article. Second stage screening used the same approach as the first stage screening. The same reviewers screened the full texts believed to be relevant to the search question, using the same questionnaire. Disagreements were resolved through discussion.

**Data extraction:**

To evaluate and present the findings, as many sources of information as possible were extracted from the included articles. As some articles included multiple sources of information, the overall totals in data categories often exceeded the number of studies. Data were extracted using standard forms and entered into Micrososft Excel tables by one reviewer (AA) and syntheisized in summary format. Extracted data included studyand population characteristics such as authors, year of publication, the study sample, the country in which the study took place, the study design and the study methodology used, the sources of information used prior to elective surgery and the type of elective surgery done.The study design was determined using the National Health and Medical Research Council (NHMRC) hierarchy of evidence.[26] The type of elective surgery was determined based on the surgical specialty as defined by the SA Health-Government of South Australia.[27] The tables were independently checked for accuracy by a second reviewer (SM), who randomly selected five research studies and checked the extracted data against the full text study. Disagreements were resolved through discussion. The information extracted that helped answer the research questions was discussed during meetings to generate an overall perspective on the factors emerging from the literature.

**Data summary and synthesis:**

The completed data extraction files were exported into STATA version 12[28] for descriptive analyses such as frequency and percentage to summarize available data.[24] An essential step in the data summary process was regular author group discussion of the nuances in the extracted data to establish overall perspectives on the sources of information patients were reported to use prior to elective surgery. The information in the spreadsheet were color coded according to the different sources ofinformation used, in order to assist with organising the reporting of the scoping review findings. Studies were grouped according to the source of information used prior to elective surgery, the study design and the the type of elective surgery done.

**Patient and public involvement**

The scoping review was done to describe the available research about the sources of information that patients use prior to elective surgery. Patients and the public were not involved in any stage of the scoping review process.

**RESULTS**

**Search findings:**

The search yielded 1039 potentially relevant citations. After removal of duplicates and irrelevant papers, 865 citations met the eligibility criteria based on title and abstract. These were obtained and full text screened, with 26 studies included in the analysis. The CONSORT diagram describing the article inclusion process is outlined in Figure 1.

**Study design and sample:**

The general characteristics of included literature are reported in Table 1. Of the 26 included studies, 69.2% (18/26) were published after 2009, and all were from developed countries. The majority of studies investigating sources of information prior to elective surgery occurred in UK, USA and Australia (15/26). A complete description of the included studies can be found on the supplementary file 2.

Table 1: General characteristics of included studies

| Characteristics | Number (n=26) | Percentage (%) |
|---|---|---|
| Publication year | | |
| 2000 – 2004 | 4 | 15.4 |
| 2005 – 2009 | 4 | 15.4 |
| 2010 - 2015 | 18 | 69.2 |
| Location of the study | | |
| Australia | 5 | 19.2 |
| Canada | 2 | 7.7 |
| Finland | 1 | 3.8 |
| Iran | 1 | 3.8 |
| Netherlands | 1 | 3.8 |
| New Zealand | 1 | 3.8 |
| Sweden | 1 | 3.8 |
| Switzerland | 1 | 3.8 |
| Taiwan | 3 | 11.5 |
| United Kingdom | 6 | 23.1 |
| United States of America | 4 | 15.4 |
| Study Design | | |
| Cross sectional | 11 | 42.3 |
| Randomized Controlled trial | 8 | 30.8 |
| Cohort | | |
| Phenomenological | 1 | 3.8 |
| Observational | 4 | 15.4 |
| Mixed Method | 1 | 3.8 |
| | 1 | 3.8 |
| Elective Surgery Specialty* | | |
| General Surgery | 10 | 37 |
| Ophthalmology | 0 | 0 |
| Neurosurgery | 0 | 0 |
| Orthopaedics | 10 | 37 |
| ENT | 1 | 3.7 |
| Urology | 1 | 3.7 |
| Gynaecology | 0 | 0 |
| Bariatric/Cosmetic/Plastic surgery | 3 | 7.4 |
| Thoracic surgery | 1 | 3.7 |
| Cranio-facial surgery | 0 | 0 |
| Cancer related | 1 | 3.7 |

*There were no studies reporting ophthalmology, neurosurgery, gynaecology, thoracic surgery or craniofacial surgery. One study included urologic and general surgery

Considering study design, 19 studies were quantitative, with cross sectional studies the most common design. Five qualitative studies used phenomenological and non-participant observation, and one study

used a mixed method research design. Ten studies involved patients who had undergone orthopaedic surgery (hip and knee arthroplasty, hip, knee and shoulder arthroscopy, back surgery and anterior cruciate ligament reconstruction). The remaining studies involved patients who had general surgery, ear, nose and throat (ENT) , urological, thoracic , plastic , or cancer related surgery.

**Sources of information based on the type of elective surgery:**

This review found that patients accessed a range of information sources during their decision-making process prior to underogoing elective surgery. The type of information used by patients is presented in Table 2.

General Surgery:

In five studies, in which the elective surgery type was not specified, the use of the internet, reliance on general practitioner (GP) or specialist-directed decisions, and influence of the family were the reported as the most common sources of information prior to elective surgery.[19,29-32]

**Table 2: Sources of information used based on elective surgery specialty**

| Specialty | Information used prior to elective surgery |
|---|---|
| General surgery | Internet, family, physician, family and friends, video, books, magazines, newspapers, leaflets |
| Orthopaedics | Physician directed, family and friends, hospitals and health care providers,Internet, multimedia, printed educational material, online education resource |
| ENT | Physician (GP and specialist), internet, friends, |
| Bariatric/Cosmetic/Plastic Surgery | Family and friends, media exposure, educational booklet, video based decision aid |
| Cancer related | Printed education materials |
| Cardiothoracic | Printed education materials |
| Urology | Physician, printed education materials |

Orthopaedic Surgery:

Hip, knee, back, and shoulder orthopaedic surgeries were reported in the largest percentage of included studies (8/27 (30%)). To facilitate shared-decision making processes, sources of information varied, such as the use of decision aids[33]; multimedia tools[34,35]; interactive videos and booklets[36,37]; online educational resources[38]; the internet[38-40] ; verbal education[41]; written educational material[41] physician/surgeon[12,42-44]; and family and friends .[43,44]

Ear, Nose and Throat (ENT) Surgery:

There was one cross-sectional study on the information accessed by patients undergoing elective ENT surgery. Information sources included information supplied by the GP, specialist information, from preadmission clinics, self-obtained information from internet and friends, and information from the syrgery consent form. Information from the pre-admission clinic (8/10) and outpatient consultation (7.5/10)was perceived and rated as having the highest quality.[45]

Bariatric/Cosmetic/Plastic Surgery:

There arethree studies about cosmetic/bariatric surgery.[46-48] The commonly-used sources of information were video-based decision aids,[46] educational booklets,[46] and family and friends and media exposure[47]. The use of high quality, video-based decision aids were shown to significantly improve knowledge of the risk and benefits before bariatric surgery. Patients were randomly assigned to review either a video-based decision aid or an educational booklet on bariatric surgery. Changes in patient decision quality were assessed using bariatric-specific measures of knowledge, values, and treatment preference after 3 months. Thus, it appears that decision aids may be an important adjunct to bariatric treatment decisions in the future. Information about the experiences of family and friends who had elective surgery increased the likelihood of women undergoing cosmetic surgery. This is due to the increased amount of information that the patient has access to, to clarify misinformation that may cause anxiety and indecisiveness.[49] Media exposure did not influence likelihood of cosmetic surgery for either sex.[49]

Other types of elective surgery:

Four papers reported health literature use for other types of elective surgery, which were colorectal surgery, coronary artery bypass graft/mitral valve replacements, and hernia repair and cholecystectomy. Video education was introduced as an adjunct to verbal information to prepare patients psychologically for elective colorectal surgery. The supplemental video education with oral and printed information was concluded to be better in preparing patients for surgery and in helping to improve their short term outcomes in the enhanced

recovery programme.[50] Of the patients, 88% rated the video information provided as adequare with 28% finding the video very helpful and more useful than other forms of patient information.

Another study provided cardiac surgery patients with a 24 page booklet to educate them on their operation, what to expect post-surgery, activity restrictions and recommendations for a safe discharge home. A survey was designed to elicit responses regarding patients' experiences of both preoperative written information received and post-operative services they received from occupational therapy while in acute care. Overall, patients were satisfied with the pre-operative cardiac surgery education provided in the written format booklet and believed that this adequately prepared them for surgery.[51]

A third study established the proportion of patients undergoing elective hernia repair or cholecystectomy, who searched the internet for information about their operations, in addition to receiving counselling and standard information at pre-admission clinics.[52] Of the patients, 59% had internet access with 79% of those with access searching for further information about their procedure on the internet. Patients who completed a questionnaire on the morning of their operation regarding their preparation for the operation in terms of health knowledge rated the information they had received as 'very good' or 'good'. However, there was considerable variability in the standard information regarding surgical treatment options and surgical complications, and this resulted into 26% patients feeling confused or worried.[53] Printed education materials used on patients with colorectal cancer undergoing elective surgery were rated as adequate by patients, but did not satisfy their demands or information needs.[53] In fact, there were demands for more information tailored to the level of patients' health literacy and information needs. Printed education materials adapted to individual patient needs has been shown to improve patient recovery during the first year following colorectal cancer surgery.[54]

A study involving patients who had non emergency surgeries of herniorrhapy, cholecystectomy and nephrectomy showed that face to face verbal education and using pamphlets are both valuable in improving the readiness to have surgery.[55]

**Information sources categorisation**

The different sources of information identified in this review were further categorised, based on the source of health information, as shown in Table 3. The total number of sources of information is greater than the number of studies, since some studies reported multiple sources of information used. 'Hard copy' includes pamphlets, booklets, brochures, written educational and information materials and newspapers. Internet, patient education and interactive videos, online education were categorised under E –learning. Face-to-face

includes GP/physician and specialist, healthcare provider, social network such as family, friends, acquaintances and hospital employees. Combinations of the different sources of information such as multimedia tools or decision aids were categorised as 'mixed'.

**Table 3: Source of health literature used by consumers**

| Clinical Specialties | Hard copy | E learning | Mixed sources | Face to face |
|---|---|---|---|---|
| **General surgery** | | | | |
| McKeague & Windsor, 2003 | ○ | ○ | | ○ |
| Proude et al, 2003 | ○ | | ○ | |
| Tamhankar et al, 2009 | ○ | ○ | | ○ |
| Lin et al, 2012 | | | | ○ |
| Ihedioha et al, 2013 | ○ | ○ | | |
| Noorian & Aein, 2015 | ○ | | | ○ |
| Lin et al, 2016 | | | | ○ |
| Lin et al, 2017 | | | | ○ |
| Baker et al, 2017 | | ○ | | |
| Wieser et al, 2017 | | ○ | | |
| | | | | |
| **Orthopaedics** | | | | |
| Deyo et al, 2000 | ○ | ○ | | |
| Hawker et al, 2001 | | | | ○ |
| Johansson et al, 2006 | ○ | | | |
| Cornoiu et al, 2010 | ○ | ○ | | ○ |
| Gooberman-Hill et al, 2010 | | | | ○ |
| Brunnekreef & Schreurs, 2011 | | ○ | | |
| Arterburn et al, 2012 | ○ | ○ | | |
| Batuyong et al, 2014 | | | ○ | |
| Fraval et al, 2015 | | ○ | | ○ |
| Hoppe et al, 2015 | | ○ | | ○ |
| | | | | |
| **ENT** | | | | |
| Georgalas et al, 2008 | ○ | ○ | | ○ |
| | | | | |
| **Bariatric/Cosmetic/Plastic surgery** | | | | |
| Brown et al, 2007 | | | ○ | ○ |
| Arterburn et al, 2011 | ○ | ○ | | |
| Parmeshwar et al, 2018 | ○ | ○ | ○ | ○ |
| | | | | |
| **Cardiothoracic** | | | | |
| O'Brien et al, 2013 | ○ | | | |
| | | | | |
| **Cancer related** | | | | |
| Smith et al, 2013 | ○ | | | |
| | | | | |
| **Urology** | | | | |

| | | | | |
|---|---|---|---|---|
| Noorian & Aein, 2015 | ○ | | | ○ |
| | | | | |
| Total (%) | 14/27 (51.9) | 14/27 (51.9) | 4/27 (14.9) | 15/27 (55.6) |

Of the 15 studies which reported face-to-face interaction as the commonly-used information exchanges, consultation with the physican was the most common source of information for patients, which was believed to promote shared decision-making. Shared decision-making offers a process which can help a physician and patient move beyond passive informed consent to a more collaborative, patient-centered experience. It reduces conflict and improves the quality of the decision for patients who are making choices about elective surgery.[12] One of the most important predictors of willingness to undergo elective surgery such as orthopaedic procedures, is having previously discussed this procedure with a physician, emphasizing the importance of the patient-physician interaction in patients' decision-making regarding surgery and medical care.[56,57] In the study by Ankuda et al (2014), while most patients (55%) reported shared-decision making with their surgeon, 36% reported patient-driven decision making and another 9% reported physician-driven decision making.[58] Patients saw clinicians as occupying expert roles and they deferred to clinicians' expertise. There was also evidence that patients modified their behaviour within consultations to complement that of clinicians.[42]

Opinions and experiences of family and friends are reported to have significant influence over patients deciding to undergo elective surgery.[29] This appears particularly relevant to cosmetic surgery. There is an increase in the number of people considering elective cosmetic surgery, possibly due to increased media attention and that many people personally know someone who had elective cosmetic surgery.[50] The experiences and information from family and friends were considered as reliable and accurate resulting in greater acceptance of the procedure and increasing likelihood of people undergoing cosmetic surgery in the future.[59] This societal trend may increase knowledge of, and familiarity with, cosmetic surgery and patients undergoing cosmetic surgery.[51,60]

Printed educational materials such as pamphlets and booklets was the most common hard resource among the 15 studies that reported hard copy as information source. Under e learning, searching for health information using the internet is the most common. Studies suggest that 50 – 80% of adults with Internet access use it for health care purposes.[61]

## DISCUSSION

This scoping review provides the first synthesis of systematically-sourced information that describes the types, and ways, in which people access information to inform their decisions about elective surgery. The body of evidence consists of 26 studies, including eight randomised controlled trials, with the remainder lower level hierarchy observational studies. These described a range of evidence sources which patients have been reported to use, to inform their choices for elective surgery for a range of health conditions. Whilst this review highlights research interest in the developed world regarding this topic, there was no research found from developing countries.

The most common source of information was doctors, specifically hospital consultants/specialists and general medical practitioners.[58] This review found that patients were generally satisfied with the information they received from their GP. They saw doctors as occupying expert roles, thus they defered to their expertise.[43] However, some studies reported that patients later stated that they had not raised disagreements or misgivings with doctors (particularly surgeons), and some expressed surprise about the decisions that were made on their behalf.[62] Patients might modify their behaviour in order to better match it to the styles of their medical practitioners, and that this may manifest itself as deference to the doctor's expertise during consultations.[63] This raises the question of potential power imbalance between medical practitioners and patients, which may also be sustained by differential awareness of the importance of role and communication in medical decision-making.[42]

The studies appeared to report an increasing trend wherein patients relied on health information coming from outside the healthcare environment, and their medical practitioners.[45,64-65] Doctors should not be threatened by this, and instead they must acknowledge that guiding patients to other sources (self-help groups, internet sites, organizations) may be as important as time actually spent talking to them. Recognising this creates a common language with the patient and can help to bypass any feelings of antagonism.[45]

The role of family and friends cannot be overestimated. As this review found, they have critical influences on patients' health decision-making. Family members played an important role in medical decision-making for elective surgery, which could enhance or restrict individual patient autonomy during the decision making process. Family members may include spouse, parents or adult children. Patients were aware that their suffering affected both themselves and their family, and they considered the primacy of the family in their treatment decisions, including compromising or agreeing to surgery to allay family anxiety or concerns.[58]

Family was identified in this review as informant information brokers, where family members can become even more informed than patients. Thus the family can provide an important communication channel between medical practitioners and patients particularly if decision-making is complex.[58,66] Family members can also act as patient advocates by defending the interests of the patient during consultations, and in the surgery decision-making process. Thereby, patients and their families can act constructively as co-agents in healthcare decision-making, and in ongoing interactions with medical professionals.[58]

The use of internet as a source of health information is rapidly growing.[19,67-68] There were approximately 13.3 million internet subscribers in Australia at the end of June 2016. Thus the number of households with access to the internet at home has steadily increased in the recent past, reaching 7.7 million in 2014–15, and representing an increase of 3% from 83% in 2012–13.[69] Patients who were more likely to use the internet were younger, better educated and employed.19 According to a study by Wong et al, out of the 2944 study participants, 28.1% had sought health information online and 17.1% had obtained information related to problems managed by the GP at that visit. The use of internet and online health information was inversely associated with age.[70] The most socioeconomically advantaged patients were significantly more likely to have obtained health information online. Disseminating health and medical information on the internet can improve knowledge transfer from health professionals to the population, and help patients to maintain and improve their health.[71] However, this is a largely unregulated source of information, thus there are reasonable concerns on the quality of health information available on the internet.[72] Information provided on the internet can be incomplete or based on insufficient scientific evidence, and moreover, the internet information can be overwhelming, conflicting and confusing.[69,73]

Other sources of information can be categorised as decision aids. These typically include brochures or pamphlets, videos or websites that can present factual information about a condition, authored by reputable sources. These information sources often present health information in plain, easy-to-understand language; describe alternative treatments; and provide information about risks and benefits associated with treatment options. Studies have shown that decision aids consistently increase patients' knowledge; improve treatment expectations; increase active participation in decision-making; reduce decisional conflict or uncertainty about the appropriate course of action; decrease the proportion of people remaining undecided about treatment; and help patients reach decisions that are closely aligned with their stated values.[74] The studies also suggest that the use of decision aids is associated with 25% fewer patients electing to have surgery.[10] The consistent use of patient decision aids may reduce the rates of elective surgery, and lower healthcare costs.[33] The use of multimedia aids (computer based, patient controlled interactive educational tool) has been reported to have a significant effect on knowledge transfer and patient

learning.[38] These aids are an adjunct to physician-patient encounters and not a substitute for them.[75] The use of multimedia programs developed specifically for pre-admission use provides patients with opportunities to access detailed, high-quality information regarding their upcoming surgery, combined with pertinent details of their hospitalization and treating physician. Multimedia tools assist patients to determine exactly how much, and the depth of, information they receive. Information about the development of the disease and alternative therapies can be presented in detail; in the program, patient and the patients have access to accurate information regarding alternatives, self-help groups, and even comments from other patients. The use of multimedia tool can reduce the communication gap between doctor and patient by giving patients the chance to educate themselves about the upcoming operation.[35,75-76] In the presence of multiple sources of health information, the challenge is how it can be tailored to deliver information specific to patients' needs.

A limitation of this review is the potential bias introduced by the inclusion of studies written in English. This will exclude additional information that might be generated from non-English studies. The timing of information sources and the outcomes measured in each study were not included in the analysis. Reviews involving these important variables should be undertaken in the future.

## CONCLUSION

This review indicated considerable variability in the types of information patients use in their decision to undergo elective surgery. Face-to-face interaction remains the most common source of patient health information prior to making choices about elective surgery. This can come from consultation with GP/specialist, and information from family and friends. Many patients consider the GP/specialist as experts and family/friends as advocates on their behalf. Other sources of health information such as the use of multimedia and decision aids have a positive effect on knowledge translation to the patient. This provides relevant evidence-based information to facilitate shared decision making processes between patient and doctors.

**Acknowledgements**

None

**Contributors:** AA, SM, KG, SB and JS were involved in the conception and design of the study. AA and SM performed the screening of the studies included in the review. AA, SM, KG, SB and JS contributed to the data analysis and synthesis, drafting and revision of the article and the final approval of the version for publication.

**Competing interest:** None declared.

**Funding**: This work was conducted as part of PhD candidature funded by a scholarship grant by the Capital Markets Cooperative Research Centre and the Australian Health Service Alliance.

**Data sharing statement**: All data relevant to the study are included in the article or uploaded as supplementary information.

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**Figure Legend**

Figure 1: Search strategy and results

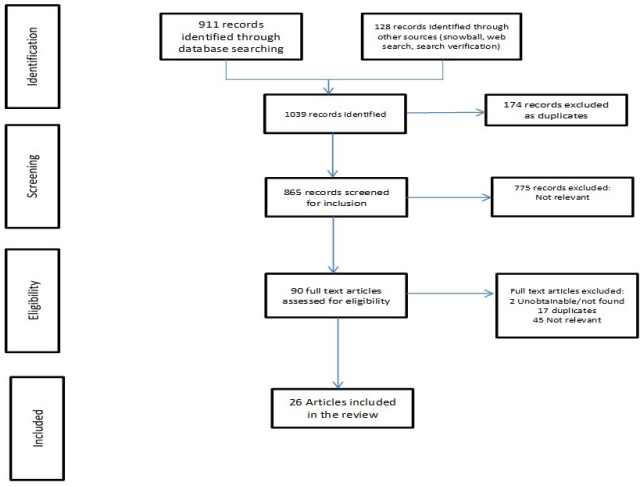


Figure 1. Search Strategy and results

Search strategy and results

108x60mm (300 x 300 DPI)

Search Terms

A. Electronic databases

| Database/platform | MEDLINE/PubMed |
|---|---|
| Date coverage | Generally 1946 to present |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | “health literacy” OR “patient education” OR “decision making” OR “choice behaviour“ OR “motivation” AND “elective surgery” OR “elective surgical procedure” OR non emergency surgery” |

| Database/platform | EMBASE |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | Non emergency surgery/ or Elective Surgical Procedures/ or elective surg*.mp. AND (orthopedics or orthopedic procedure$ or orthopaedic or arthroplasty).mp.<br>AND<br>educational status/ or health literacy/ or health status/ or patient education.mp OR personal autonomy/ or motivation/ or patient/ or satisfaction/ or decision making/<br>OR (source$ adj2 inform*).mp. |

| Database/platform | CINAHL |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (EBSCO) |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

| Database/platform | SCOPUS |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | In: “Article Title, Abstract, Keywords” |
| Search query | ( ( ( TITLE-ABS-KEY ( "elective surgery" ) OR TITLE-ABS-KEY ( elective surgical procedures ) OR TITLE-ABS-KEY ( non emergency surgery ) ) ) AND ( ( TITLE-ABS-KEY ( orthopedics ) OR TITLE-ABS- |

| | |
|---|---|
| | KEY ( orthopedic procedure$ ) OR TITLE-ABS-KEY ( orthopaedic ) ) ) ) AND ( ( ( TITLE-ABS-KEY ( educational status ) OR TITLE-ABS-KEY ( health literacy ) OR TITLE-ABS-KEY ( health status ) OR TITLE-ABS-KEY ( patient education ) ) ) OR ( TITLE-ABS-KEY ( sources information ) ) ) |

| | |
|---|---|
| Database/platform | Academic Search premier |
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

B. Web search and websites

| | |
|---|---|
| Website | Google<br>South Australia Department of Health<br>Commonwealth Department of Health<br>Department of Social Services My Aged Care |
| URL | https://www.google.com.au<br>https://www.sahealth.sa.gov.au<br>https://www.health.gov.au<br>https://www.myagedcare |
| Limits | Verbatim |
| Search query | “health literacy” AND “elective surgery” |

| Supplementary file 2: Overview of the studies included in the scoping review | | | | | | | | | | | |
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| | | | | | | | | | | | |
| Authors | Year | Country | Title | Journal | Aim | Study design | Sample | n= | Setting | Surgery type | Sources of information |
| Deyo R, Cherkin D, Weinstein J, Howe J, Ciol, M, Mulley A | 2000 | USA | Involving patients in clinical decisions impact of an interactive video program on use of back surgery | Medical Care | To determine the impact on outcomes and surgical choices of an interactive, diagnosis specific videodisk program for informing patients about treatment choices | Randomized controlled trial | Adult patients | 393 | primary care clinics in Seattle | elective surgery for patients with herniated disks, spinal stenosis and others | Video, booklet |
| Hawker A, Wright J, Coyte P, Williams J, Harvey B, Glazier R, Wilkins A, Badley E | 2001 | Canada | Determining the need for hip and knee arthroplasty: The role of clinical severity and patients' preferences | Medical Care | To determine whether area arthroplasty rates reflect patient related demand factors | population based mail and telephone survey (cross sectional) | Adult patients | 48218 | high and low areas in Ontario, Canada | hip/knee arthroplasty | physician, someone who had joint arthroplasty |

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| McKeague M, Windsor J | 2003 | New Zealand | Patients' perception of the adequacy of informed consent: a pilot study of elective general surgical patients in Auckland | The New Zealand Medical Journal | To determine the adequacy of the informed consent process from the patient's perspective and in the light of the published standards | Cross sectional | Adult patients | 77 | hospital in Auckland, New Zealand | general surgical operations (head and neck, breast, upper gastrointestinal, colorectal, other) | verbal information (physician), written information, video |
| Proude E, Shourie S, Conigrave K, Wutzke S, Ward J, Haber P | 2003 | Australia | Do elective surgery patients use the internet to look for information about their condition? | ANZ Journal of Surgery | To examine the proportion and characteristics of patients scheduled for elective surgery who had accessed internet information about their condition | Cross sectional | Adult patients | 1571 | patients attending pre admission clinics at Concord repatriation general Hospital and the Royal Prince Albert Hospital in Sydney | general elective surgery (not specified) | friends/relatives, books/magazines, allied health, television/radio, internet, newspaper |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Johansson K, Salanterra S, Katajisto J | 2006 | Finland | Empowering orthopaedic patients through preadmission education: Results from a clinical study | Patient Education and Counseling | To determine whether it is possible to increase patients' knowledge and certainty about care-related issues, to reach a more empowering learning experience and to exercise a more positive impact on selected clinical outcomes by means of additional preadmissio n education (education using the | randomized pre-test post-test design | Adult patients | 123 | Surgical ward of one university hospital | hip arthroplasty | written education material plus education using the concept map method, written education material alone |

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| | | | | | concept map method added to standard preadmissio n education) than by means of standard preadmissio n education (written educational material with non systematic oral education) | | | | | | |
| Brown A, Furnham A, Glanville L, Swami V | 2007 | United Kingdom | Factors that affect the likelihood of undergoing cosmetic surgery | Aesthetic Surgery Journal | To determine the factors that might motivate a nonclinical, nonpatient population to undergo cosmetic surgery | Cross sectional | Adult patients | 208 | convenienc e sample of subjects from public spaces (trains stations, libraries and cafeterias) | Plastic/cosm etic surgery | family and friends, media (programs and articles) |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Georgalas C, Ganesh K, Papesch E | 2008 | United Kingdom | The information and consent process in patients undergoing elective ENT surgery: A cross sectional survey | BMC Ear, Nose and Throat Disorders | To assess the importance of different information pathways for patients undergoing elective ENT surgery and to correlate their relative importance with patient and doctor factors | Cross sectional | patients undergoing elective ENT surgery | 226 | patients at a district general hospital in London | ENT surgery | GP/specialist, preadmission clinic, information sheets, information from consent form, self-obtained information (family and friends, internet) |
| Tamhankar A, Mazari F, Everitt N, Ravi K | 2009 | United Kingdom | Use of internet by patients undergoing elective hernia repair or cholecystectomy | Annals of The Royal College of Surgeons of England | To establish the proportion of patients undergoing two common surgical procedures, who searched the internet for information about their operations and to assess the usefulness of the information | Cross sectional | patients undergoing elective abdominal wall hernia repair or laparoscopic cholecystectomy | 105 | patients from a single surgical firm | General Surgery | information leaflets, internet |

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| | | | | | they received | | | | | | |
| Gooberman-Hill R, Sansom A, Sanders C, Dieppe P, Horwood J, Learmonth I, Williams S, Donovan J | 2010 | United Kingdom | Unstated factors in orthopaedic decision-making: a qualitative study | BMC Musculoskeletal Disorders | To examine how decision are made about total joint replacement un orthopaedic consultations | Qualitative | patients with hip and knee osteoarthritis | 26 | three hospital sites within the two National health Service (NHS) trust in a United Kingdom (UK) city | total joint replacement surgery | physician |
| ArterburnD, Westbrook E, Bogart A, Sepucha K, Boch S, Weppner W | 2011 | USA | Randomized trial of a video-based patient decision aid for bariatric surgery | Obesity | To determine whether a video based bariatric decision aid intervention results in superior decision quality compared to an educational booklet | Randomized controlled trial | Adult patients | 152 | Group health cooperative in King County, Washington | Bariatric surgery | video decision aids, educational booklet |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Brunnekreef J, Schreurs B | 2011 | | Total hip arthroplasty: what information do we offer patients on websites of hospitals | BMC Health services research | To investigate what kind of information is offered to total hip arthroplasty patients by internet and what information is appreciated by them | Cross sectional | Total hip arthroplasty patients | 102 | patients from the Dutch Rheumatic Patients Organization and the Dutch Polyarthrosis Patients Organization | Total hip arthroplasty | Online information (health information on hospital websites) |
| Cornoiu A, Beischer A, Donnan L, Graves S, de Steiger R | 2011 | | Multimedia patient education to assist the informed consent process for knee arthroscopy | ANZ Journal of Surgery | To compare the efficacy of computer-based multimedia presentation against standardized verbal consent and information pamphlets for patients considering knee arthroscopy surgery | Randomized controlled trial | Knee arthroscopy patients | 61 | patients on a waiting list for knee arthroscopy surgery | Knee arthroscopy surgery | computer based multimedia information, face to face/verbal, pamphlet |

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| Arterburn D, Wellman R, Westbrook E, Rutter C, Ross T, McCulloch D, Handley M, Jung C | 2012 | USA | Introducing decision aids at group health was linked to sharply lower hip and knee surgery rates and cost | Health Affairs | To examine the association between introducing decision aids for hip and knee osteoarthritis and the rates of joint replacement surgery and cost | Observational | patients with knee or hip osteoarthritis | 9515 | outpatient clinic by a group[p health orthopaedic provider | Hip and knee replacement | evidence based video and written decision aids |
| Lin M, Pang M, Chen C | 2012 | Taiwan | Family as a whole: elective surgery patients' perception of the meaning of family involvement in decision making | Journal of clinical nursing | To explore patient perception of the meaning of family involvement in elective surgery decision making in Taiwan | Qualitative phenomenological | Adult patients | 10 | medical center in Southern Taiwan | general elective surgery (not specified) | Family |
| Ihedioha U, Vaughan S, Masterman n J, Singh B, Cahudri S | 2013 | | Patient education videos for elective colorectal surgery: results of a randomized controlled trial | Colorectal disease | To examine the efficacy of video education as a component of the enhanced recovery programme | Randomized controlled trial | elective colorectal surgery patients | 65 | not mentioned | elective colorectal surgery | Video and information leaflets |

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| | | | | | and its subsequent incorporation into routine clinical practice | | | | | | |
| O'Brien L, McKeough C, Abbasi R | 2013 | Australia | Pre-surgery education for elective cardiac surgery patients: A survey from the patient's perspective | Australian Occupational Therapy Journal | To evaluate cardiac surgery patients' perception of the effectiveness and timing of pre admission multidisciplinary written information and post-operative verbal education provided by occupational therapy | Cross sectional | post cardiac surgery patients | 118 | Cardiothoracic unit at the Alfred hospital | elective cardiothoracic surgery | Booklet |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Smith F, Carlsson E, Kokkinakis D, Forsberg M, Kokeda K, Sawatzky R, | 2013 | Sweden | Readability, suitability and comprehensibility in patient education materials for Swedish patients with colorectal cancer undergoing elective surgery: a mixed method design | Patient Education and Counseling | To characterize education materials provided to patients undergoing colorectal cancer (CRC) surgery to gain a better understanding of how to design a readable, suitable, comprehensible materials | Mixed method | Adult patients | 27 hospitals and 4 stoma care companies; 15 patients who had CRC surgery | University hospital in Sweden | Elective colorectal cancer surgery | Patient education materials (brochures or leaflets) |
| Batuyong E, Jowett A, Wickramasinghe N, Beischer A | 2014 | Australia | Using multimedia to enhance the consent process for bunion correction surgery | Orthopaedics | To assess the efficiency of multimedia technology as an adjunct to the informed consent process | Prospective cohort | Adult patients | 55 | Patients in private practice setting | Bunion correction surgery | Multimedia patient education technology (three dimensional conputer animation with a script content |

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| Hoppe D, Denkerrs M, Hoppe F, Wong I | 2015 | Canada | The use of video before arthroscopic shoulder surgery to enhance patient recall and satisfaction: a randomized controlled study | Journal of Shoulder and Elbow Surgery | To assess the efficacy of an educated video tutorial on early learning of information specific to patients undergoing shoulder arthroscopy when it was used as an adjunct to the standard preoperative consultation | Randomized controlled trial | Adult patients | 34 | Single center from private practice | patients who required arthroscopic repair of either a rotator cuff or a labral tear | video, surgeon |
| Fraval A, Chandranath J, Chong Y, Tran P, Coventry L | 2015 | Australia | internet based patient education improved informed consent for elective orthopaedic surgery: a randomized controlled trial | BMC Musculoskeletal Disorders | To investigate whether the use of a patient information website, to augment patient education and informed consent for elective orthopaedic procedures | Randomized controlled trial | Adult patients | 211 | patients from the Western health orthopaedic outpatient clinic | total hip/knee arthroplasty, knee/shoulder arthroscopy, ACL reconstruction | physician, online education resource |

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| | | | | | is an effective measure | | | | | | |
| Noorian C, Aein F | 2015 | Iran | Comparative investigation of the effectiveness of face to face verbal training and educational pamphlets on readiness of patients before undergoing non-emergency surgery | Journal of Education and Health Promotion | To compare the effectiveness of face to face verbal training and educational pamphlets on readiness of patients before undergoing non-emergency surgery | Randomized controlled trial | Adult patients | 90 | patients refereed to the surgery rooms of Shahrekord Kashani Hospital | non-emergency surgeries of herniorrhapy, cholecystectomy and nephrectomy | pamphlet, physician |
| Lin M, Huang C, Chen C | 2016 | Taiwan | Reasons for family involvement in elective surgical decision-making in Taiwan: a qualitative study | Journal of clinical nursing | To inquire into the reasons for family involvement in adult patients' surgical decision-making processes from the point of | Qualitative phenomenological | family members of elective surgery patients | 12 | medical centre in Southern Taiwan | elective surgery not specified | family |

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| | | | | | view of the patients' family | | | | | | |
| Baker D, Marshall J, Lee, M, Jones G, Brown S, Lobo A | 2017 | United Kingdom | YouTube as a source of information for patients considering surgery for ulcerative colitis | Journal of Surgical Research | To assess the content of the most viewed videos on YouTube related to surgery of ulcerative colitis | Qualitative phenomenological | YouTube search based on the qualitative interviews of patients who had surgery for ulcerative colitis | 50 videos from YouTube | N/A | ulcerative colitis | YouTube (internet) |
| Lin M, Chen C | 2017 | Taiwan | Difficulties in surgical decision making and associated factors among elective surgery patients in Taiwan | The Journal of Nursing Research | To explore the perceived difficulties in surgical decision making and related factors among elective surgery patients | Cross sectional | Adult patients | 90 | medical centre in Southern Taiwan | elective surgery not specified | self, physician, family |

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| Wieser T, Steurer MP, Steurer M, Dullenkopf A | 2017 | Switzerland | Factors influencing the level of patients using the internet to gather information before anaesthesia: A single-centre survey of 815 patients in Switzerland | BMC Anaesthesiology | To identify factors associated with patients using the internet to find information about their upcoming surgery in general, and more specifically about anaesthesia | Cross sectional | Adult patients | 815 | patients at the department of Anaesthesia and Intensive Care at the Kantonsspital Frauenfeld (TG Switzerland) | elective surgery not specified | internet |
| Parmeshwar N, Reid C, Park A, Brandel M, Dobke M, Gosman A | 2018 | USA | Evaluation of information sources in plastic surgery decision making | Cureus | To elucidate the extent of usage and impact of information sources in plastic surgery decision making and to investigate what motives the outside search for information before and after | Cross sectional | Adult patients | 58 | patients from health practitioners affiliated with UC San Diego | Plastic surgery (abdominoplasty, breast reconstruction and breast reduction) | plastic surgery providers, EMMI video, internet, social media, family and friends, books/pamphlets |

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| | | | | | meeting the surgeon, as well as any differences in the perceived value of various sources based on individual characteristics. | | | | | | |

**Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist**

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| **TITLE** | | | |
| Title | 1 | Identify the report as a scoping review. | 1 |
| **ABSTRACT** | | | |
| Structured summary | 2 | Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives. | 3 |
| **INTRODUCTION** | | | |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach. | 5-6 |
| Objectives | 4 | Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives. | 6 |
| **METHODS** | | | |
| Protocol and registration | 5 | Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number. | Click here to enter text. |
| Eligibility criteria | 6 | Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale. | 7 |
| Information sources* | 7 | Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed. | 7 |
| Search | 8 | Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated. | Supplementary file 1 |
| Selection of sources of evidence† | 9 | State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review. | 7-8 |
| Data charting process‡ | 10 | Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators. | 8-9 |
| Data items | 11 | List and define all variables for which data were sought and any assumptions and simplifications made. | 8, supplementary file 2 |
| Critical appraisal of individual | 12 | If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe | Click here to enter text. |

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| sources of evidence§ | | the methods used and how this information was used in any data synthesis (if appropriate). | |
| Synthesis of results | 13 | Describe the methods of handling and summarizing the data that were charted. | 9 |
| **RESULTS** | | | |
| Selection of sources of evidence | 14 | Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram. | Figure 1 |
| Characteristics of sources of evidence | 15 | For each source of evidence, present characteristics for which data were charted and provide the citations. | 9-10 |
| Critical appraisal within sources of evidence | 16 | If done, present data on critical appraisal of included sources of evidence (see item 12). | Click here to enter text. |
| Results of individual sources of evidence | 17 | For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives. | Supplementary file 2 |
| Synthesis of results | 18 | Summarize and/or present the charting results as they relate to the review questions and objectives. | 9-15 |
| **DISCUSSION** | | | |
| Summary of evidence | 19 | Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups. | 16-18 |
| Limitations | 20 | Discuss the limitations of the scoping review process. | 18 |
| Conclusions | 21 | Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps. | 18 |
| **FUNDING** | | | |
| Funding | 22 | Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review. | 19 |

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

*From:* Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. ;169:467–473. doi: 10.7326/M18-0850

BMJ Open

# SOURCES OF INFORMATION USED BY PATIENTS PRIOR TO ELECTIVE SURGERY: A SCOPING REVIEW



| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2018-023080.R2 |
| Article Type: | Research |
| Date Submitted by the Author: | 07-Jun-2019 |
| Complete List of Authors: | Atlas, Alvin; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences; Capital Markets CRC Ltd, Health Market Quality Research<br>Milanese, Steve; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Grimmer, Karen; University of South Australia Division of Health Sciences, International Centre for Allied Health Evidence - School of Health Sciences<br>Barras, Sarah; Australian Health Service Alliance<br>Stephens, Jacqueline; University of South Australia Division of Health Sciences, Centre for Population Health Research |
| Primary Subject Heading: | Surgery |
| Secondary Subject Heading: | Health informatics |
| Keywords: | health literacy, elective surgical procedures, scoping review, review, consumer health information |
| | |

# SOURCES OF INFORMATION USED BY PATIENTS PRIOR TO ELECTIVE SURGERY: A SCOPING REVIEW

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**Short Title:** Elective surgery information sources

**Keywords:**

health literacy [MeSH]

electivesurgical procedures [MeSH]

review [MeSH]

scoping review

consumer health information [MeSH]

**Word Count (abstract)/limit:** 305

**Word count (text)/limit:** 4221

**ABSTRACT**

**Objective:** To describe the range and nature of available research regarding sources of information that patients access, to inform their decisions about elective surgery.

**Design:** Scoping review.

**Data sources:** Peer-reviewed studies published until February 2019 from the six scientific literature databases were searched and included in the study.: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS. Web searches for grey literature were conducted in Google , South Australia Department of Health, Commonwealth Department of Health (Australia) and My Aged Care from the Department of Social Services (Australia).

**Eligibility criteria:** Studies with focus on elective surgery information sources oriented to patients were eligible for inclusion. Only studies written in English were sought and no publication date or study restrictions were applied.

**Data extraction and synthesis:** Included literature was described by National Health and Medical Council hierarchy of evidence, and data was extracted on country and year of publication, type of literature, who provided it and any information on end-users. Information sources were categorised by type and how information was presented.

**Results:** A pool of 1039 articles was reduced to 26 after screening for duplicates and non-relevant studies. Face-to-face exchanges were the most likely source of information prior to elective surgery (59.3%), printed information (55.6%) followed by e-learning (51.9%), and multimedia (14.8%) The face-to-face category included information provided by physician/general practitioners/specialists, and family and friends. Printed information included brochures and pamphlets, e-learning consisted of internet sites or videos, and the use of multimedia included different mixed media format.

**Conclusion:** There is considerable variability regarding the types of information patients use in their decision to undergo elective surgery . The most common source of health information (face to face interaction with medical personnel) raises the question that the information provided could be incomplete and/or biased, and dependent on what their health provider knew, or chose to tell them.

**Strengths and limitations of the study**

- The scoping review was conducted to identify available evidence on the health information used by patients that could inform future research and healthcare practices.
- This scoping review represents a diverse sample of elective surgery procedures.
- There is a limited research on patient decision making for elective surgery procedures.
- Quality assessment of the included studies will not be conducted as this scoping review aims to provide a snapshot of the different sources of information used by patients prior to elective surgery by being inclusive of all types of information currently available.

## INTRODUCTION

Elective surgery is a term used to describe non-emergency surgery which is medically necessary, but which can be delayed for at least 24-hours.[1] There has been an increasing demand for elective surgery in Australia over the past decade, however the capacity of health systems to respond to has been limited by funding and workforce availability.[2]

In public hospitals there are generally constraints on resources (such as workforce training, workforce availability, operating theatres and beds).[3] Access to elective surgery is rationed through the use of waiting lists in which patients are assigned to urgency categories.[4] Elective surgery in public hospitals can be provided for people who have inadequate or no private health insurance, and who rely on Medicare funding for their health care. Medicare is the Australian universal public health insurance which pays standard fees for medical and hospital care for all Australian citizens and permanent residents.[5] In private hospitals, when privately funded patients register for elective surgery, waiting lists rarely exist because patients and/or their insurer(s) are paying the costs of surgery.

Data from the Australian Institute of Health and Welfare indicates that in 2014-2015, public hospitals admitted approximately 698,000 patients from elective surgery waiting lists.[6] Between 2010-2011 and 2014-2015, elective surgery admissions in public hospitals increased by 1.3%. Elective surgery admissions to private hospitals increased by an average of 3% per year between 2010-2011 and 2014-2015. This translates to an increase in private hospital elective surgery admissions from 1,279,501 (2010-2011) to 1,438,722 (2014-2015).[7]

Little is known about the impact of surgical waiting lists on patients, their families, workplaces or society. There is little consistency on how waiting time is defined and monitored, and little is understood on the social, financial anf health impact of waiting on patients.[8,9] Moreover , there is rarely a 'best choice' for the management of many health conditions.[10] Over 50% patients placed on an orthopaedic surgical waiting list of a large tertiary hospital were managed effectively without surgery, by early physiotherapy triage, education about their condition, and offering a range of conservative treatment options.[11] Ensuring that patients can make informed choices at the time of referral to an elective surgery waiting list might assist patients to engage more actively in treatment decisions.[12]

To be able to make the best decision regarding treatment options, patients require an adequate level of health literacy and comprehensive information sources. This should include information about their condition and all possible treatment alternatives, risks, and benefits.[13] Health literacy relates to patients and their families having the skills and supports to make considered decisions about their best health care options.[14] Compared with adequate health literacy, poor health literacy has been associated with increased rates of hospitalisations and greater use of emergency care, poorer ability to demonstrate taking medications appropriately, poorer ability to interpret labels and health messages, poorer knowledge among patients regarding their health conditions, poorer overall health status and higher risk of death among older people. [15,16]

Individuals' ability to access, understand and use information about their condition will influence the decisions they make, and actions they take, about treatment.[13,17] To support their health literacy, patients require readily accessible, clear, focused, useable and evidence-based information about their health condition, the available health care choices, and costs, risks and likely outcomes from each.[18]

However, little is known about how, why and where patients access health information.[19,20] In order to improve patient health literacy, more needs to be known regarding whether patients are utilising any of the information available to them in making health decisions regarding elective surgery, or what information sources are most readily accessed and valued. It has been suggested that despite the explosion of available information, patients may still receive care that is based more on their provider's habits and choices, than their own preferences.[21]

Access to health information is essential in the shared decision making (SDM) process between the patients and healthcare practitioners. SDM involves collaboration between the patient and the practitioner to discuss treatment options, ensures that the patient is adequately informed, and decides on the care options taking into consideration the patient's principles and preferences.[22] Patient participation in SDM with their health practitioner is higher when they know their treatment, screening or diagnostic procedure options. [23]

This scoping review was undertaken with the aim of describing the range and nature of available research concerning the sources of information that patients access to inform their choices about elective surgery, and how this information is used in their decision-making.

## METHODS

The methodology was based on the framework outlined by Arksey and O'Malley,[24] and the recommendations made by Levac.[25] Scoping review phases comprised defining the research question, searching for relevant studies, selecting the studies relevant to the scoping question, charting the data, and collating, summarising and reporting the results. The only review phase which was not undertaken was the optional consultation phase, as this was not relevant to the review purpose.

### Defining the Research Question:

This scoping review was guided by the research question: 'What are the sources of information that patients use to inform their decision to undergo elective surgery?'

### Identifying relevant studies:

The liaison health librarian at the University of South Australia independently conducted the literature searches in April 2016, and these were checked again in February 2019. Only studies written in English were sought, and no publication date or study design restrictions were applied. Six scientific databases were searched: Medline, PubMed, CINAHL, Academic Search Premier, EMBASE, SCOPUS. Search queries were tailored to the specific requirements of each database (see supplementary file 1).

A grey literature search was undertaken to identify seminal documents regarding health literacy and patient choice, that may have been developed for purposes other than scientific peer-reviewed publications. Web searches for grey literature were conducted via Google (www.google.com); SA Department of Health (http://www.sahealth.sa.gov.au); Commonwealth Department of Health (http://www.health.gov.au); and the Department of Social Services My Aged Care (http://www.myagedcare.gov.au).

The search terms used included Medical Subject Headings (MESH), and words and phrases identified from preliminary reading. The reference lists of included studies and grey literature were also manually searched to identify additional papers not captured in the search. The new literature was collated using a snowball technique where new literature was counted once only.

### Selecting the literature:

Studies were eligible for inclusion if they were scientific papers focused on elective surgery and patients' health literacy, and concerned with the sources of information influencing patients' decisions to undergo

elective surgery. To standardise screening decisions, the inclusion criteria were developed into a questionnaire and used for a two staged screening process to determine the relevance of the literature.

For first stage screening, the title and abstract of citations were reviewed independently by two reviewers (AA, SM). Reviewers were not masked to author or journal name. Disagreements whether or not literature should be included for full review were resolved through discussion until consensus is reached. Reviewers met throughout the screening process to resolve conflicts and discuss any uncertainties related to study selection.[25]

For second stage screening, all citations deemed potentially relevant after first stage screening were procured in full text. For articles that could not be obtained through institutional holdings available to the authors, attempts were made to contact the author or journal for assistance in procuring the article. Second stage screening used the same approach as the first stage screening. The same reviewers screened the full texts believed to be relevant to the search question, using the same questionnaire. Disagreements were resolved through discussion.

**Data extraction:**

To evaluate and present the findings, as many sources of information as possible were extracted from the included articles. As some articles included multiple sources of information, the overall totals in data categories often exceeded the number of studies. Data were extracted using standard forms and entered into Micrososft Excel tables by one reviewer (AA) and syntheisized in summary format. Extracted data included studyand population characteristics such as authors, year of publication, the study sample, the country in which the study took place, the study design and the study methodology used, the sources of information used prior to elective surgery and the type of elective surgery done.The study design was determined using the National Health and Medical Research Council (NHMRC) hierarchy of evidence.[26] The type of elective surgery was determined based on the surgical specialty as defined by the SA Health-Government of South Australia.[27] The tables were independently checked for accuracy by a second reviewer (SM), who randomly selected five research studies and checked the extracted data against the full text study. Disagreements were resolved through discussion. The information extracted that helped answer the research questions was discussed during meetings to generate an overall perspective on the factors emerging from the literature.

**Data summary and synthesis:**

The completed data extraction files were exported into STATA version 12[28] for descriptive analyses such as frequency and percentage to summarize available data.[24] An essential step in the data summary process was regular author group discussion of the nuances in the extracted data to establish overall perspectives on the sources of information patients were reported to use prior to elective surgery. The information in the spreadsheet were color coded according to the different sources ofinformation used, in order to assist with organising the reporting of the scoping review findings. Studies were grouped according to the source of information used prior to elective surgery, the study design and the the type of elective surgery done.

**Patient and public involvement**

The scoping review was done to describe the available research about the sources of information that patients use prior to elective surgery. Patients and the public were not involved in any stage of the scoping review process.

**RESULTS**

**Search findings:**

The search yielded 1039 potentially relevant citations. After removal of duplicates and irrelevant papers, 865 citations met the eligibility criteria based on title and abstract. These were obtained and full text screened, with 26 studies included in the analysis. The CONSORT diagram describing the article inclusion process is outlined in Figure 1.

**Study design and sample:**

The general characteristics of included literature are reported in Table 1. Of the 26 included studies, 69.2% (18/26) were published after 2009, and all were from developed countries. The majority of studies investigating sources of information prior to elective surgery occurred in UK, USA and Australia (15/26). A complete description of the included studies can be found on the supplementary file 2.

Table 1: General characteristics of included studies

| Characteristics | Number (n=26) | Percentage (%) |
|---|---|---|
| Publication year | | |
| 2000 – 2004 | 4 | 15.4 |
| 2005 – 2009 | 4 | 15.4 |
| 2010 - 2015 | 18 | 69.2 |
| Location of the study | | |
| Australia | 5 | 19.2 |
| Canada | 2 | 7.7 |
| Finland | 1 | 3.8 |
| Iran | 1 | 3.8 |
| Netherlands | 1 | 3.8 |
| New Zealand | 1 | 3.8 |
| Sweden | 1 | 3.8 |
| Switzerland | 1 | 3.8 |
| Taiwan | 3 | 11.5 |
| United Kingdom | 6 | 23.1 |
| United States of America | 4 | 15.4 |
| Study Design | | |
| Cross sectional | 11 | 42.3 |
| Randomized Controlled trial | 8 | 30.8 |
| Cohort | | |
| Phenomenological | 1 | 3.8 |
| Observational | 4 | 15.4 |
| Mixed Method | 1 | 3.8 |
| | 1 | 3.8 |
| Elective Surgery Specialty* | | |
| General Surgery | 10 | 37 |
| Ophthalmology | 0 | 0 |
| Neurosurgery | 0 | 0 |
| Orthopaedics | 10 | 37 |
| ENT | 1 | 3.7 |
| Urology | 1 | 3.7 |
| Gynaecology | 0 | 0 |
| Bariatric/Cosmetic/Plastic surgery | 3 | 7.4 |
| Thoracic surgery | 1 | 3.7 |
| Cranio-facial surgery | 0 | 0 |
| Cancer related | 1 | 3.7 |

*There were no studies reporting ophthalmology, neurosurgery, gynaecology, thoracic surgery or craniofacial surgery. One study included urologic and general surgery

Considering study design, 19 studies were quantitative, with cross sectional studies the most common design. Five qualitative studies used phenomenological and non-participant observation, and one study

used a mixed method research design. Ten studies involved patients who had undergone orthopaedic surgery (hip and knee arthroplasty, hip, knee and shoulder arthroscopy, back surgery and anterior cruciate ligament reconstruction). The remaining studies involved patients who had general surgery, ear, nose and throat (ENT) , urological, thoracic , plastic , or cancer related surgery.

**Sources of information based on the type of elective surgery:**

This review found that patients accessed a range of information sources during their decision-making process prior to underogoing elective surgery. The type of information used by patients is presented in Table 2.

General Surgery:

In five studies, in which the elective surgery type was not specified, the use of the internet, reliance on general practitioner (GP) or specialist-directed decisions, and influence of the family were the reported as the most common sources of information prior to elective surgery.[19,29-32]

**Table 2: Sources of information used based on elective surgery specialty**

| Specialty | Information used prior to elective surgery |
|---|---|
| General surgery | Internet, family, physician, family and friends, video, books, magazines, newspapers, leaflets |
| Orthopaedics | Physician directed, family and friends, hospitals and health care providers,Internet, multimedia, printed educational material, online education resource |
| ENT | Physician (GP and specialist), internet, friends, |
| Bariatric/Cosmetic/Plastic Surgery | Family and friends, media exposure, educational booklet, video based decision aid |
| Cancer related | Printed education materials |
| Cardiothoracic | Printed education materials |
| Urology | Physician, printed education materials |

Orthopaedic Surgery:

Hip, knee, back, and shoulder orthopaedic surgeries were reported in the largest percentage of included studies (8/27 (30%)). To facilitate shared-decision making processes, sources of information varied, such as the use of decision aids[33]; multimedia tools[34,35]; interactive videos and booklets[36,37]; online educational resources[38]; the internet[38-40] ; verbal education[41]; written educational material[41] physician/surgeon[12,42-44]; and family and friends .[43,44]

Ear, Nose and Throat (ENT) Surgery:

There was one cross-sectional study on the information accessed by patients undergoing elective ENT surgery. Information sources included information supplied by the GP, specialist information, from preadmission clinics, self-obtained information from internet and friends, and information from the syrgery consent form. Information from the pre-admission clinic (8/10) and outpatient consultation (7.5/10)was perceived and rated as having the highest quality.[45]

Bariatric/Cosmetic/Plastic Surgery:

There arethree studies about cosmetic/bariatric surgery.[46-48] The commonly-used sources of information were video-based decision aids,[46] educational booklets,[46] and family and friends and media exposure[47]. The use of high quality, video-based decision aids were shown to significantly improve knowledge of the risk and benefits before bariatric surgery. Patients were randomly assigned to review either a video-based decision aid or an educational booklet on bariatric surgery. Changes in patient decision quality were assessed using bariatric-specific measures of knowledge, values, and treatment preference after 3 months. Thus, it appears that decision aids may be an important adjunct to bariatric treatment decisions in the future. Information about the experiences of family and friends who had elective surgery increased the likelihood of women undergoing cosmetic surgery. This is due to the increased amount of information that the patient has access to, to clarify misinformation that may cause anxiety and indecisiveness.[49] Media exposure did not influence likelihood of cosmetic surgery for either sex.[49]

Other types of elective surgery:

Four papers reported health literature use for other types of elective surgery, which were colorectal surgery, coronary artery bypass graft/mitral valve replacements, and hernia repair and cholecystectomy. Video education was introduced as an adjunct to verbal information to prepare patients psychologically for elective colorectal surgery. The supplemental video education with oral and printed information was concluded to be better in preparing patients for surgery and in helping to improve their short term outcomes in the enhanced

recovery programme.[50] Of the patients, 88% rated the video information provided as adequare with 28% finding the video very helpful and more useful than other forms of patient information.

Another study provided cardiac surgery patients with a 24 page booklet to educate them on their operation, what to expect post-surgery, activity restrictions and recommendations for a safe discharge home. A survey was designed to elicit responses regarding patients' experiences of both preoperative written information received and post-operative services they received from occupational therapy while in acute care. Overall, patients were satisfied with the pre-operative cardiac surgery education provided in the written format booklet and believed that this adequately prepared them for surgery.[51]

A third study established the proportion of patients undergoing elective hernia repair or cholecystectomy, who searched the internet for information about their operations, in addition to receiving counselling and standard information at pre-admission clinics.[52] Of the patients, 59% had internet access with 79% of those with access searching for further information about their procedure on the internet. Patients who completed a questionnaire on the morning of their operation regarding their preparation for the operation in terms of health knowledge rated the information they had received as 'very good' or 'good'. However, there was considerable variability in the standard information regarding surgical treatment options and surgical complications, and this resulted into 26% patients feeling confused or worried.[53] Printed education materials used on patients with colorectal cancer undergoing elective surgery were rated as adequate by patients, but did not satisfy their demands or information needs.[53] In fact, there were demands for more information tailored to the level of patients' health literacy and information needs. Printed education materials adapted to individual patient needs has been shown to improve patient recovery during the first year following colorectal cancer surgery.[54]

A study involving patients who had non emergency surgeries of herniorrhapy, cholecystectomy and nephrectomy showed that face to face verbal education and using pamphlets are both valuable in improving the readiness to have surgery.[55]

**Information sources categorisation**

The different sources of information identified in this review were further categorised, based on the source of health information, as shown in Table 3. The total number of sources of information is greater than the number of studies, since some studies reported multiple sources of information used. 'Hard copy' includes pamphlets, booklets, brochures, written educational and information materials and newspapers. Internet, patient education and interactive videos, online education were categorised under E –learning. Face-to-face

includes GP/physician and specialist, healthcare provider, social network such as family, friends, acquaintances and hospital employees. Combinations of the different sources of information such as multimedia tools or decision aids were categorised as 'mixed'.

**Table 3: Source of health literature used by consumers**

| Clinical Specialties | Hard copy | E learning | Mixed sources | Face to face |
|---|---|---|---|---|
| **General surgery** | | | | |
| McKeague & Windsor, 2003 | ○ | ○ | | ○ |
| Proude et al, 2003 | ○ | | ○ | ○ |
| Tamhankar et al, 2009 | ○ | ○ | | ○ |
| Lin et al, 2012 | | | | ○ |
| Ihedioha et al, 2013 | ○ | ○ | | |
| Noorian & Aein, 2015 | ○ | | | ○ |
| Lin et al, 2016 | | | | ○ |
| Lin et al, 2017 | | | | ○ |
| Baker et al, 2017 | | ○ | | |
| Wieser et al, 2017 | | ○ | | |
| | | | | |
| **Orthopaedics** | | | | |
| Deyo et al, 2000 | ○ | ○ | | |
| Hawker et al, 2001 | | | | ○ |
| Johansson et al, 2006 | ○ | | | |
| Cornoiu et al, 2010 | ○ | ○ | | ○ |
| Gooberman-Hill et al, 2010 | | | | ○ |
| Brunnekreef & Schreurs, 2011 | | ○ | | |
| Arterburn et al, 2012 | ○ | ○ | | |
| Batuyong et al, 2014 | | | ○ | |
| Fraval et al, 2015 | | ○ | | ○ |
| Hoppe et al, 2015 | | ○ | | ○ |
| | | | | |
| **ENT** | | | | |
| Georgalas et al, 2008 | ○ | ○ | | ○ |
| | | | | |
| **Bariatric/Cosmetic/Plastic surgery** | | | | |
| Brown et al, 2007 | | | ○ | ○ |
| Arterburn et al, 2011 | ○ | ○ | | |
| Parmeshwar et al, 2018 | ○ | ○ | ○ | ○ |
| | | | | |
| **Cardiothoracic** | | | | |
| O'Brien et al, 2013 | ○ | | | |
| | | | | |
| **Cancer related** | | | | |
| Smith et al, 2013 | ○ | | | |
| | | | | |
| **Urology** | | | | |

| | | | | |
|---|---|---|---|---|
| Noorian & Aein, 2015 | ○ | | | ○ |
| | | | | |
| Total (%) | 15/27 (55.6) | 14/27 (51.9) | 4/27 (14.9) | 16/27 (59.3) |

Of the 16 studies which reported face-to-face interaction as the commonly-used information exchanges, consultation with the physican was the most common source of information for patients, which was believed to promote shared decision-making. Shared decision-making offers a process which can help a physician and patient move beyond passive informed consent to a more collaborative, patient-centered experience. It reduces conflict and improves the quality of the decision for patients who are making choices about elective surgery.[12] One of the most important predictors of willingness to undergo elective surgery such as orthopaedic procedures, is having previously discussed this procedure with a physician, emphasizing the importance of the patient-physician interaction in patients' decision-making regarding surgery and medical care.[56,57] In the study by Ankuda et al (2014), while most patients (55%) reported shared-decision making with their surgeon, 36% reported patient-driven decision making and another 9% reported physician-driven decision making.[58] Patients saw clinicians as occupying expert roles and they deferred to clinicians' expertise. There was also evidence that patients modified their behaviour within consultations to complement that of clinicians.[42]

Opinions and experiences of family and friends are reported to have significant influence over patients deciding to undergo elective surgery.[29] This appears particularly relevant to cosmetic surgery. There is an increase in the number of people considering elective cosmetic surgery, possibly due to increased media attention and that many people personally know someone who had elective cosmetic surgery.[50] The experiences and information from family and friends were considered as reliable and accurate resulting in greater acceptance of the procedure and increasing likelihood of people undergoing cosmetic surgery in the future.[59] This societal trend may increase knowledge of, and familiarity with, cosmetic surgery and patients undergoing cosmetic surgery.[51,60]

Printed educational materials such as pamphlets and booklets was the most common hard resource among the 15 studies that reported hard copy as information source. Under e learning, searching for health information using the internet is the most common. Studies suggest that 50 – 80% of adults with Internet access use it for health care purposes.[61]

## DISCUSSION

This scoping review provides the first synthesis of systematically-sourced information that describes the types, and ways, in which people access information to inform their decisions about elective surgery. The body of evidence consists of 26 studies, including eight randomised controlled trials, with the remainder lower level hierarchy observational studies. These described a range of evidence sources which patients have been reported to use, to inform their choices for elective surgery for a range of health conditions. Whilst this review highlights research interest in the developed world regarding this topic, there was no research found from developing countries.

The most common source of information was doctors, specifically hospital consultants/specialists and general medical practitioners.[58] This review found that patients were generally satisfied with the information they received from their GP. They saw doctors as occupying expert roles, thus they defered to their expertise.[43] However, some studies reported that patients later stated that they had not raised disagreements or misgivings with doctors (particularly surgeons), and some expressed surprise about the decisions that were made on their behalf.[62] Patients might modify their behaviour in order to better match it to the styles of their medical practitioners, and that this may manifest itself as deference to the doctor's expertise during consultations.[63] This raises the question of potential power imbalance between medical practitioners and patients, which may also be sustained by differential awareness of the importance of role and communication in medical decision-making.[42]

The studies appeared to report an increasing trend wherein patients relied on health information coming from outside the healthcare environment, and their medical practitioners.[45,64-65] Doctors should not be threatened by this, and instead they must acknowledge that guiding patients to other sources (self-help groups, internet sites, organizations) may be as important as time actually spent talking to them. Recognising this creates a common language with the patient and can help to bypass any feelings of antagonism.[45]

The role of family and friends cannot be overestimated. As this review found, they have critical influences on patients' health decision-making. Family members played an important role in medical decision-making for elective surgery, which could enhance or restrict individual patient autonomy during the decision making process. Family members may include spouse, parents or adult children. Patients were aware that their suffering affected both themselves and their family, and they considered the primacy of the family in their treatment decisions, including compromising or agreeing to surgery to allay family anxiety or concerns.[58]

Family was identified in this review as informant information brokers, where family members can become even more informed than patients. Thus the family can provide an important communication channel between medical practitioners and patients particularly if decision-making is complex.[58,66] Family members can also act as patient advocates by defending the interests of the patient during consultations, and in the surgery decision-making process. Thereby, patients and their families can act constructively as co-agents in healthcare decision-making, and in ongoing interactions with medical professionals.[58]

The use of internet as a source of health information is rapidly growing.[19,67-68] There were approximately 13.3 million internet subscribers in Australia at the end of June 2016. Thus the number of households with access to the internet at home has steadily increased in the recent past, reaching 7.7 million in 2014–15, and representing an increase of 3% from 83% in 2012–13.[69] Patients who were more likely to use the internet were younger, better educated and employed.19 According to a study by Wong et al, out of the 2944 study participants, 28.1% had sought health information online and 17.1% had obtained information related to problems managed by the GP at that visit. The use of internet and online health information was inversely associated with age.[70] The most socioeconomically advantaged patients were significantly more likely to have obtained health information online. Disseminating health and medical information on the internet can improve knowledge transfer from health professionals to the population, and help patients to maintain and improve their health.[71] However, this is a largely unregulated source of information, thus there are reasonable concerns on the quality of health information available on the internet.[72] Information provided on the internet can be incomplete or based on insufficient scientific evidence, and moreover, the internet information can be overwhelming, conflicting and confusing.[69,73]

Other sources of information can be categorised as decision aids. These typically include brochures or pamphlets, videos or websites that can present factual information about a condition, authored by reputable sources. These information sources often present health information in plain, easy-to-understand language; describe alternative treatments; and provide information about risks and benefits associated with treatment options. Studies have shown that decision aids consistently increase patients' knowledge; improve treatment expectations; increase active participation in decision-making; reduce decisional conflict or uncertainty about the appropriate course of action; decrease the proportion of people remaining undecided about treatment; and help patients reach decisions that are closely aligned with their stated values.[74] The studies also suggest that the use of decision aids is associated with 25% fewer patients electing to have surgery.[10] The consistent use of patient decision aids may reduce the rates of elective surgery, and lower healthcare costs.[33] The use of multimedia aids (computer based, patient controlled interactive educational tool) has been reported to have a significant effect on knowledge transfer and patient

learning.[38] These aids are an adjunct to physician-patient encounters and not a substitute for them.[75] The use of multimedia programs developed specifically for pre-admission use provides patients with opportunities to access detailed, high-quality information regarding their upcoming surgery, combined with pertinent details of their hospitalization and treating physician. Multimedia tools assist patients to determine exactly how much, and the depth of, information they receive. Information about the development of the disease and alternative therapies can be presented in detail; in the program, patient and the patients have access to accurate information regarding alternatives, self-help groups, and even comments from other patients. The use of multimedia tool can reduce the communication gap between doctor and patient by giving patients the chance to educate themselves about the upcoming operation.[35,75-76] In the presence of multiple sources of health information, the challenge is how it can be tailored to deliver information specific to patients' needs.

A limitation of this review is the potential bias introduced by the inclusion of studies written in English. This will exclude additional information that might be generated from non-English studies. The timing of information sources and the outcomes measured in each study were not included in the analysis. Reviews involving these important variables should be undertaken in the future.

## CONCLUSION

This review indicated considerable variability in the types of information patients use in their decision to undergo elective surgery. Face-to-face interaction remains the most common source of patient health information prior to making choices about elective surgery. This can come from consultation with GP/specialist, and information from family and friends. Many patients consider the GP/specialist as experts and family/friends as advocates on their behalf. Other sources of health information such as the use of multimedia and decision aids have a positive effect on knowledge translation to the patient. This provides relevant evidence-based information to facilitate shared decision making processes between patient and doctors.

**Acknowledgements**

None

**Contributors:** AA, SM, KG, SB and JS were involved in the conception and design of the study. AA and SM performed the screening of the studies included in the review. AA, SM, KG, SB and JS contributed to the data analysis and synthesis, drafting and revision of the article and the final approval of the version for publication.

**Competing interest:** None declared.

**Funding**: This work was conducted as part of PhD candidature funded by a scholarship grant by the Capital Markets Cooperative Research Centre and the Australian Health Service Alliance.

**Data sharing statement**: All data relevant to the study are included in the article or uploaded as supplementary information.

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**Figure Legend**

Figure 1: Search strategy and results

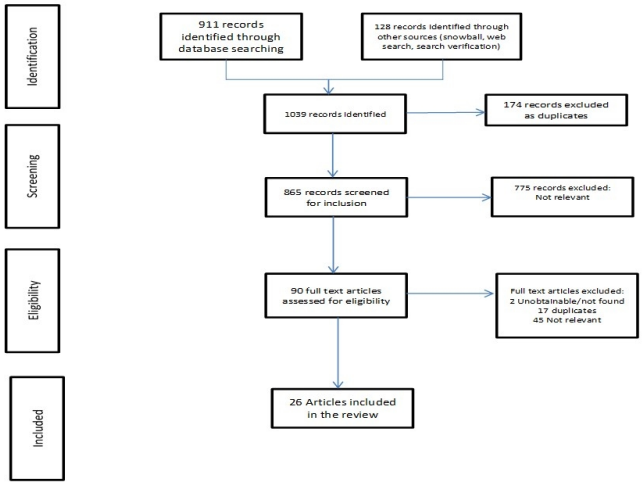


Figure 1. Search Strategy and results

Search strategy and results

108x60mm (300 x 300 DPI)

Search Terms

A. Electronic databases

| Database/platform | MEDLINE/PubMed |
|---|---|
| Date coverage | Generally 1946 to present |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | “health literacy” OR “patient education” OR “decision making” OR “choice behaviour“ OR “motivation” AND “elective surgery” OR “elective surgical procedure” OR non emergency surgery” |

| Database/platform | EMBASE |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (Ovid) |
| Limits | In: “Article Title, Abstract, Keywords”<br>Published: “All years” to “present”<br>Document type: “All”<br>Subject areas: All checked (default) |
| Search query | Non emergency surgery/ or Elective Surgical Procedures/ or elective surg*.mp. AND (orthopedics or orthopedic procedure$ or orthopaedic or arthroplasty).mp.<br>AND<br>educational status/ or health literacy/ or health status/ or patient education.mp OR personal autonomy/ or motivation/ or patient/ or satisfaction/ or decision making/<br>OR (source$ adj2 inform*).mp. |

| Database/platform | CINAHL |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia (EBSCO) |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

| Database/platform | SCOPUS |
|---|---|
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | In: “Article Title, Abstract, Keywords” |
| Search query | ( ( ( TITLE-ABS-KEY ( "elective surgery" ) OR TITLE-ABS-KEY ( elective surgical procedures ) OR TITLE-ABS-KEY ( non emergency surgery ) ) ) AND ( ( TITLE-ABS-KEY ( orthopedics ) OR TITLE-ABS- |

| | |
|---|---|
| | KEY ( orthopedic procedure$ ) OR TITLE-ABS-KEY ( orthopaedic ) ) ) ) AND ( ( ( TITLE-ABS-KEY ( educational status ) OR TITLE-ABS-KEY ( health literacy ) OR TITLE-ABS-KEY ( health status ) OR TITLE-ABS-KEY ( patient education ) ) ) OR ( TITLE-ABS-KEY ( sources information ) ) ) |

| | |
|---|---|
| Database/platform | Academic Search premier |
| Date coverage | No limit |
| Library | University of South Australia |
| Limits | none |
| Search query | elective surg* OR elective surgical procedure OR non emergency surgery AND orthopedic* OR orthopaedic*<br><br>AND<br><br>"health literacy OR source* adj2 inform* OR patient educ* |

B. Web search and websites

| | |
|---|---|
| Website | Google<br>South Australia Department of Health<br>Commonwealth Department of Health<br>Department of Social Services My Aged Care |
| URL | https://www.google.com.au<br>https://www.sahealth.sa.gov.au<br>https://www.health.gov.au<br>https://www.myagedcare |
| Limits | Verbatim |
| Search query | “health literacy” AND “elective surgery” |

| Supplementary file 2: Overview of the studies included in the scoping review | | | | | | | | | | | |
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| | | | | | | | | | | | |
| Authors | Year | Country | Title | Journal | Aim | Study design | Sample | n= | Setting | Surgery type | Sources of information |
| Deyo R, Cherkin D, Weinstein J, Howe J, Ciol, M, Mulley A | 2000 | USA | Involving patients in clinical decisions impact of an interactive video program on use of back surgery | Medical Care | To determine the impact on outcomes and surgical choices of an interactive, diagnosis specific videodisk program for informing patients about treatment choices | Randomized controlled trial | Adult patients | 393 | primary care clinics in Seattle | elective surgery for patients with herniated disks, spinal stenosis and others | Video, booklet |
| Hawker A, Wright J, Coyte P, Williams J, Harvey B, Glazier R, Wilkins A, Badley E | 2001 | Canada | Determining the need for hip and knee arthroplasty: The role of clinical severity and patients' preferences | Medical Care | To determine whether area arthroplasty rates reflect patient related demand factors | population based mail and telephone survey (cross sectional) | Adult patients | 48218 | high and low areas in Ontario, Canada | hip/knee arthroplasty | physician, someone who had joint arthroplasty |

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| McKeague M, Windsor J | 2003 | New Zealand | Patients' perception of the adequacy of informed consent: a pilot study of elective general surgical patients in Auckland | The New Zealand Medical Journal | To determine the adequacy of the informed consent process from the patient's perspective and in the light of the published standards | Cross sectional | Adult patients | 77 | hospital in Auckland, New Zealand | general surgical operations (head and neck, breast, upper gastrointestinal, colorectal, other) | verbal information (physician), written information, video |
| Proude E, Shourie S, Conigrave K, Wutzke S, Ward J, Haber P | 2003 | Australia | Do elective surgery patients use the internet to look for information about their condition? | ANZ Journal of Surgery | To examine the proportion and characteristics of patients scheduled for elective surgery who had accessed internet information about their condition | Cross sectional | Adult patients | 1571 | patients attending pre admission clinics at Concord repatriation general Hospital and the Royal Prince Albert Hospital in Sydney | general elective surgery (not specified) | friends/relatives, books/magazines, allied health, television/radio, internet, newspaper |

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| Johansson K, Salanterra S, Katajisto J | 2006 | Finland | Empowering orthopaedic patients through preadmission education: Results from a clinical study | Patient Education and Counseling | To determine whether it is possible to increase patients' knowledge and certainty about care-related issues, to reach a more empowering learning experience and to exercise a more positive impact on selected clinical outcomes by means of additional preadmissio n education (education using the | randomized pre-test post-test design | Adult patients | 123 | Surgical ward of one university hospital | hip arthroplasty | written education material plus education using the concept map method, written education material alone |

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| | | | | | concept map method added to standard preadmissio n education) than by means of standard preadmissio n education (written educational material with non systematic oral education) | | | | | | |
| Brown A, Furnham A, Glanville L, Swami V | 2007 | United Kingdom | Factors that affect the likelihood of undergoing cosmetic surgery | Aesthetic Surgery Journal | To determine the factors that might motivate a nonclinical, nonpatient population to undergo cosmetic surgery | Cross sectional | Adult patients | 208 | convenienc e sample of subjects from public spaces (trains stations, libraries and cafeterias) | Plastic/cosm etic surgery | family and friends, media (programs and articles) |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Georgalas C, Ganesh K, Papesch E | 2008 | United Kingdom | The information and consent process in patients undergoing elective ENT surgery: A cross sectional survey | BMC Ear, Nose and Throat Disorders | To assess the importance of different information pathways for patients undergoing elective ENT surgery and to correlate their relative importance with patient and doctor factors | Cross sectional | patients undergoing elective ENT surgery | 226 | patients at a district general hospital in London | ENT surgery | GP/specialist, preadmission clinic, information sheets, information from consent form, self-obtained information (family and friends, internet) |
| Tamhankar A, Mazari F, Everitt N, Ravi K | 2009 | United Kingdom | Use of internet by patients undergoing elective hernia repair or cholecystectomy | Annals of The Royal College of Surgeons of England | To establish the proportion of patients undergoing two common surgical procedures, who searched the internet for information about their operations and to assess the usefulness of the information | Cross sectional | patients undergoing elective abdominal wall hernia repair or laparoscopic cholecystectomy | 105 | patients from a single surgical firm | General Surgery | information leaflets, internet |

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| | | | | | they received | | | | | | |
| Gooberman-Hill R, Sansom A, Sanders C, Dieppe P, Horwood J, Learmonth I, Williams S, Donovan J | 2010 | United Kingdom | Unstated factors in orthopaedic decision-making: a qualitative study | BMC Musculoskeletal Disorders | To examine how decision are made about total joint replacement un orthopaedic consultations | Qualitative | patients with hip and knee osteoarthritis | 26 | three hospital sites within the two National health Service (NHS) trust in a United Kingdom (UK) city | total joint replacement surgery | physician |
| ArterburnD, Westbrook E, Bogart A, Sepucha K, Boch S, Weppner W | 2011 | USA | Randomized trial of a video-based patient decision aid for bariatric surgery | Obesity | To determine whether a video based bariatric decision aid intervention results in superior decision quality compared to an educational booklet | Randomized controlled trial | Adult patients | 152 | Group health cooperative in King County, Washington | Bariatric surgery | video decision aids, educational booklet |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Brunnekreef J, Schreurs B | 2011 | | Total hip arthroplasty: what information do we offer patients on websites of hospitals | BMC Health services research | To investigate what kind of information is offered to total hip arthroplasty patients by internet and what information is appreciated by them | Cross sectional | Total hip arthroplasty patients | 102 | patients from the Dutch Rheumatic Patients Organization and the Dutch Polyarthrosis Patients Organization | Total hip arthroplasty | Online information (health information on hospital websites) |
| Cornoiu A, Beischer A, Donnan L, Graves S, de Steiger R | 2011 | | Multimedia patient education to assist the informed consent process for knee arthroscopy | ANZ Journal of Surgery | To compare the efficacy of computer-based multimedia presentation against standardized verbal consent and information pamphlets for patients considering knee arthroscopy surgery | Randomized controlled trial | Knee arthroscopy patients | 61 | patients on a waiting list for knee arthroscopy surgery | Knee arthroscopy surgery | computer based multimedia information, face to face/verbal, pamphlet |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Arterburn D, Wellman R, Westbrook E, Rutter C, Ross T, McCulloch D, Handley M, Jung C | 2012 | USA | Introducing decision aids at group health was linked to sharply lower hip and knee surgery rates and cost | Health Affairs | To examine the association between introducing decision aids for hip and knee osteoarthritis and the rates of joint replacement surgery and cost | Observational | patients with knee or hip osteoarthritis | 9515 | outpatient clinic by a group[p health orthopaedic provider | Hip and knee replacement | evidence based video and written decision aids |
| Lin M, Pang M, Chen C | 2012 | Taiwan | Family as a whole: elective surgery patients' perception of the meaning of family involvement in decision making | Journal of clinical nursing | To explore patient perception of the meaning of family involvement in elective surgery decision making in Taiwan | Qualitative phenomenological | Adult patients | 10 | medical center in Southern Taiwan | general elective surgery (not specified) | Family |
| Ihedioha U, Vaughan S, Masterman n J, Singh B, Cahudri S | 2013 | | Patient education videos for elective colorectal surgery: results of a randomized controlled trial | Colorectal disease | To examine the efficacy of video education as a component of the enhanced recovery programme | Randomized controlled trial | elective colorectal surgery patients | 65 | not mentioned | elective colorectal surgery | Video and information leaflets |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | and its subsequent incorporation into routine clinical practice | | | | | | |
| O'Brien L, McKeough C, Abbasi R | 2013 | Australia | Pre-surgery education for elective cardiac surgery patients: A survey from the patient's perspective | Australian Occupational Therapy Journal | To evaluate cardiac surgery patients' perception of the effectiveness and timing of pre admission multidisciplinary written information and post-operative verbal education provided by occupational therapy | Cross sectional | post cardiac surgery patients | 118 | Cardiothoracic unit at the Alfred hospital | elective cardiothoracic surgery | Booklet |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Smith F, Carlsson E, Kokkinakis D, Forsberg M, Kokeda K, Sawatzky R, | 2013 | Sweden | Readability, suitability and comprehensibility in patient education materials for Swedish patients with colorectal cancer undergoing elective surgery: a mixed method design | Patient Education and Counseling | To characterize education materials provided to patients undergoing colorectal cancer (CRC) surgery to gain a better understanding of how to design a readable, suitable, comprehensible materials | Mixed method | Adult patients | 27 hospitals and 4 stoma care companies; 15 patients who had CRC surgery | University hospital in Sweden | Elective colorectal cancer surgery | Patient education materials (brochures or leaflets) |
| Batuyong E, Jowett A, Wickramasinghe N, Beischer A | 2014 | Australia | Using multimedia to enhance the consent process for bunion correction surgery | Orthopaedics | To assess the efficiency of multimedia technology as an adjunct to the informed consent process | Prospective cohort | Adult patients | 55 | Patients in private practice setting | Bunion correction surgery | Multimedia patient education technology (three dimensional conputer animation with a script content |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Hoppe D, Denkerrs M, Hoppe F, Wong I | 2015 | Canada | The use of video before arthroscopic shoulder surgery to enhance patient recall and satisfaction: a randomized controlled study | Journal of Shoulder and Elbow Surgery | To assess the efficacy of an educated video tutorial on early learning of information specific to patients undergoing shoulder arthroscopy when it was used as an adjunct to the standard preoperative consultation | Randomized controlled trial | Adult patients | 34 | Single center from private practice | patients who required arthroscopic repair of either a rotator cuff or a labral tear | video, surgeon |
| Fraval A, Chandranath J, Chong Y, Tran P, Coventry L | 2015 | Australia | internet based patient education improved informed consent for elective orthopaedic surgery: a randomized controlled trial | BMC Musculoskeletal Disorders | To investigate whether the use of a patient information website, to augment patient education and informed consent for elective orthopaedic procedures | Randomized controlled trial | Adult patients | 211 | patients from the Western health orthopaedic outpatient clinic | total hip/knee arthroplasty, knee/shoulder arthroscopy, ACL reconstruction | physician, online education resource |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | is an effective measure | | | | | | |
| Noorian C, Aein F | 2015 | Iran | Comparative investigation of the effectiveness of face to face verbal training and educational pamphlets on readiness of patients before undergoing non-emergency surgery | Journal of Education and Health Promotion | To compare the effectiveness of face to face verbal training and educational pamphlets on readiness of patients before undergoing non-emergency surgery | Randomized controlled trial | Adult patients | 90 | patients refereed to the surgery rooms of Shahrekord Kashani Hospital | non-emergency surgeries of herniorrhapy, cholecystectomy and nephrectomy | pamphlet, physician |
| Lin M, Huang C, Chen C | 2016 | Taiwan | Reasons for family involvement in elective surgical decision-making in Taiwan: a qualitative study | Journal of clinical nursing | To inquire into the reasons for family involvement in adult patients' surgical decision-making processes from the point of | Qualitative phenomenological | family members of elective surgery patients | 12 | medical centre in Southern Taiwan | elective surgery not specified | family |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | view of the patients' family | | | | | | |
| Baker D, Marshall J, Lee, M, Jones G, Brown S, Lobo A | 2017 | United Kingdom | YouTube as a source of information for patients considering surgery for ulcerative colitis | Journal of Surgical Research | To assess the content of the most viewed videos on YouTube related to surgery of ulcerative colitis | Qualitative phenomenological | YouTube search based on the qualitative interviews of patients who had surgery for ulcerative colitis | 50 videos from YouTube | N/A | ulcerative colitis | YouTube (internet) |
| Lin M, Chen C | 2017 | Taiwan | Difficulties in surgical decision making and associated factors among elective surgery patients in Taiwan | The Journal of Nursing Research | To explore the perceived difficulties in surgical decision making and related factors among elective surgery patients | Cross sectional | Adult patients | 90 | medical centre in Southern Taiwan | elective surgery not specified | self, physician, family |

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| Wieser T, Steurer MP, Steurer M, Dullenkopf A | 2017 | Switzerland | Factors influencing the level of patients using the internet to gather information before anaesthesia: A single-centre survey of 815 patients in Switzerland | BMC Anaesthesiology | To identify factors associated with patients using the internet to find information about their upcoming surgery in general, and more specifically about anaesthesia | Cross sectional | Adult patients | 815 | patients at the department of Anaesthesia and Intensive Care at the Kantonsspital Frauenfeld (TG Switzerland) | elective surgery not specified | internet |
| Parmeshwar N, Reid C, Park A, Brandel M, Dobke M, Gosman A | 2018 | USA | Evaluation of information sources in plastic surgery decision making | Cureus | To elucidate the extent of usage and impact of information sources in plastic surgery decision making and to investigate what motives the outside search for information before and after | Cross sectional | Adult patients | 58 | patients from health practitioners affiliated with UC San Diego | Plastic surgery (abdominoplasty, breast reconstruction and breast reduction) | plastic surgery providers, EMMI video, internet, social media, family and friends, books/pamphlets |

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| | | | | | meeting the surgeon, as well as any differences in the perceived value of various sources based on individual characteristics. | | | | | | |

**Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist**

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| **TITLE** | | | |
| Title | 1 | Identify the report as a scoping review. | 1 |
| **ABSTRACT** | | | |
| Structured summary | 2 | Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives. | 3 |
| **INTRODUCTION** | | | |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach. | 5-6 |
| Objectives | 4 | Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives. | 6 |
| **METHODS** | | | |
| Protocol and registration | 5 | Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number. | Click here to enter text. |
| Eligibility criteria | 6 | Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale. | 7 |
| Information sources* | 7 | Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed. | 7 |
| Search | 8 | Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated. | Supplementary file 1 |
| Selection of sources of evidence† | 9 | State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review. | 7-8 |
| Data charting process‡ | 10 | Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators. | 8-9 |
| Data items | 11 | List and define all variables for which data were sought and any assumptions and simplifications made. | 8, supplementary file 2 |
| Critical appraisal of individual | 12 | If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe | Click here to enter text. |

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| sources of evidence§ | | the methods used and how this information was used in any data synthesis (if appropriate). | |
| Synthesis of results | 13 | Describe the methods of handling and summarizing the data that were charted. | 9 |
| **RESULTS** | | | |
| Selection of sources of evidence | 14 | Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram. | Figure 1 |
| Characteristics of sources of evidence | 15 | For each source of evidence, present characteristics for which data were charted and provide the citations. | 9-10 |
| Critical appraisal within sources of evidence | 16 | If done, present data on critical appraisal of included sources of evidence (see item 12). | Click here to enter text. |
| Results of individual sources of evidence | 17 | For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives. | Supplementary file 2 |
| Synthesis of results | 18 | Summarize and/or present the charting results as they relate to the review questions and objectives. | 9-15 |
| **DISCUSSION** | | | |
| Summary of evidence | 19 | Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups. | 16-18 |
| Limitations | 20 | Discuss the limitations of the scoping review process. | 18 |
| Conclusions | 21 | Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps. | 18 |
| **FUNDING** | | | |
| Funding | 22 | Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review. | 19 |

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

*From:* Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. ;169:467–473. doi: 10.7326/M18-0850