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## HEALTH PSYCHOLOGY | REVIEW ARTICLE

# A case for evidence based patient education: Differences in short term and long term patient outcomes for total vs. subtotal hysterectomy using a systematic review of literature

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**Abstract:** One of the important decisions that must be made for many benign cases indicating hysterectomy is the choice between total hysterectomy and subtotal hysterectomy. In this article, a systematic review of literature regarding short- and long-term health and quality-of-life patient outcomes is completed, in an effort to provide an evidence-based patient educational resource for medical professionals to provide women facing a decision about treatment options for benign gynecologic conditions. An additional goal of the author, after evaluation and synthesization of the literature, is to suggest differences between subtotal and total hysterectomies that may require further research prior to being able to strongly suggest one type of surgery over the other.

**Subjects:** Health Conditions; Medicine; Nursing; Midwifery

**Keywords:** hysterectomy; supracervical hysterectomy; subtotal hysterectomy; and total hysterectomy



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### PUBLIC INTEREST STATEMENT

The authors have experienced a current lack of evidence-based patient education offered to women with benign gynecological conditions requiring removal of the uterus, regarding the option for which type of hysterectomy will be performed. A subtotal hysterectomy means that the woman may keep her cervix, whereas a total hysterectomy would include removal of the cervix. A systematic review of literature has shown some differences in short-term and long-term patient outcomes. It is the position of the authors that each patient should be given the opportunity to make an informed decision. This article provides options for women to make informed decisions about their gynecological surgery and care.

## 1. Introduction

The need for hysterectomy can feel overwhelming to a patient. One of the commonly presented treatment options for benign gynecologic conditions is hysterectomy. Although there are two different types of hysterectomy, subtotal hysterectomy and total hysterectomy, patients are not consistently given a choice between the two types of surgical procedures. After a thorough review of available literature, it is evident that there is a deficit in the education provided to women in regard to differences in treatment options, including total vs. subtotal hysterectomy. After a thorough systematic review of the available literature, the author proposes that women need to be consistently given a choice between subtotal and total hysterectomy, through an educational discussion with the operating physician that includes differences in patient health and quality-of-life outcomes between the two procedures.

## 2. Definitions

There are two main types of hysterectomy: total and subtotal (also termed “supracervical”). A total hysterectomy is the removal of the uterus, including the cervix. A cuff is created at the top of the vagina by stitching the top of the vagina shut, resulting in scar tissue at the top of the vagina. The ligaments are detached, and the uterosacral cardinal ligament that previously attached to the cervix is stitched to the sides of the vagina to hold it in place (Wheless & Roenneburg, 2015).

A subtotal hysterectomy is the removal of the uterus at or below the isthmus, leaving the cervix intact (American College of Obstetricians & Gynecologists, 2010). Subtotal hysterectomy is a less complex procedure: the uterus is cut-off above the cervix, and the endometrial tissue remaining is cored or cauterized. The uterosacral cardinal ligament, which is attached to the cervix, remains attached to the cervix, continuing to hold the vagina in place as it previously had.

## 3. Literature review

The lack of option presented to women, with benign gynecological conditions, is a serious issue that impacts many. The most recent surveillance data on hysterectomy indicate a decreasing utilization trend, but it continues as the second most common surgery for women, second only to cesarean section (CDC, 2016; Cohen, Vitonis, & Einarsson, 2014). According to the most recent data, approximately 480,000 hysterectomies are performed in the United States (US) annually, of which 87% occur as treatment for benign gynecologic conditions (Cohen et al., 2014). Of the hysterectomies performed for benign conditions, 56% were open abdominal procedures, 20% were laparoscopic procedures, 19% were vaginal procedures, and 5% were robotically assisted procedures (Cohen et al., 2014). By the age of 60, one-third of all women in the US have had a hysterectomy (CDC, 2016). This startling statistic emphasizes the need for a focus on enhanced patient education to ensure educated decision-making by the patient, regarding which type of hysterectomy she will choose to have performed.

According to Magon (2012), before 1950, the majority of hysterectomies were subtotal, as this was a shorter and simpler procedure. Over time, the advent of modern anesthesia, advanced antibiotics and the banking of blood have created a safer context for completion of total hysterectomy, which has in many settings become the standard of care. One of the main pieces of rationale for total hysterectomy is eliminating the risk of cervical cancer. By the early 1990s, less than 1% of all hysterectomies were subtotal. As a result of the combination of advances in cervical cancer screening and treatment, the availability of new laparoscopic options, the publication of limited studies showing better sexual satisfaction and pelvic support, and the reported numbers of subtotal procedures began to increase in the early 2000s (Magon, 2012). The current rate of subtotal hysterectomy is 12.9% of all hysterectomies for benign conditions (Cohen et al., 2014).

Hysterectomy can have major impacts physically, emotionally, sexually, and economically for both individuals and the health care system (Bardens, 2012). Thus, it is imperative to have as much knowledge available to guide patients and their providers in making the best evidence-based informed treatment decisions. One of the important decisions that must be made for many benign

cases indicating hysterectomy is the choice between total procedure and subtotal procedure. There is research that finds differences in outcomes when comparing the procedures, and there is research that finds no differences in the same outcomes. The ACOG used to have an ethics opinion (#388) advising practitioners not to advocate for patients that subtotal hysterectomy was superior to total hysterectomy. That ethics opinion was withdrawn in May 2015 without written explanation (American College of Obstetricians & Gynecologists, 2015).

The theory for why a subtotal hysterectomy may be better than a total hysterectomy for benign gynecological conditions is based on the fact that there is less physiological trauma to the pelvic structures and complex ganglion of nerves that are found in the cervical area (Lethaby, Mukhopadhyay, & Naik, 2012). As a result of less surgical trauma to those structures and nerves, women may have an easier recovery, less possibility of future prolapse, and less future incidences of urinary incontinence and sexual dysfunction. Earlier studies found beneficial differences in subtotal hysterectomy outcomes, but they were limited and were not randomized controlled trials.

### **3.1. Current general comparison of outcomes**

Greer et al. (2010) conducted a longest term study comparing the two hysterectomy approaches. The identified problem was that there had been some earlier, small, uncontrolled studies associating total hysterectomy to subtotal, which showed higher rates of prolapse, sexual dysfunction, and urinary tract symptoms and complications. This was a longitudinal, randomized controlled trial. All participants were to undergo an abdominal hysterectomy. Participants were randomized to either the Total Abdominal Hysterectomy (TAH) group or the Supracervical Abdominal Hysterectomy (SAH) group. Greer et al. followed up with the participants nine years after surgery. The researchers reported no difference in most of the measurements, including incidences of prolapse. The differences found were, (1) the TAH group reported a greater increase in sexual satisfaction from baseline before surgery, although this group reported more sexual problems at baseline than the SAH group and (2) the TAH group reported a significantly higher score on the physical component on the Health-Related Quality of Life. However, there were significantly more women in the SAH group that had a bilateral oophorectomy than in the TAH group, and there was no control of this confounding variable. Eleven percent of the SAH group experienced regular vaginal bleeding. There was significant attrition in the sample. Of the three sites originally included, only one site was available for follow-up testing. Furthermore, only 37 of the original 54 participants at the one remaining site responded to the nine-year followup.

The same year, Ellström Engh, Jerhamre, and Junskog (2010) reported another randomized controlled trial comparing the changes in psychological well-being and sexual health after subtotal and total hysterectomy. This study only included premenopausal women without a previous or concurrent oophorectomy. There were 132 patients in the sample, with half randomized to each group (total or subtotal). The route (abdominal, vaginal, or laparoscopic) was determined by the surgeon based on each patient's specific situation. The follow-up testing was conducted one year after surgery. The researchers reported that there was significantly greater sexual satisfaction and frequency of orgasm in the subtotal group. Also, they reported psychological well-being and personal assessment of general health were significantly greater in the subtotal group. This study had limitations including significant sample attrition. Ten participants from each group did not show up for post-testing, 11 were not sexually active and thus could not report measurements, and two declined to answer the post-test questions. In addition, the researchers found it impossible to blind the participants, since the type of surgery that the women had either was revealed by other medical personnel or was discoverable by self-examination.

There was also a Cochrane systematic review comparing the short-term and long-term outcomes of subtotal vs. total hysterectomy for benign gynecological conditions (Lethaby et al., 2012). They found nine randomized controlled trials, totaling 1,553 participants, for inclusion. They found no difference between the two procedures for most urinary functions, bowel functions, quality of life, and hospital readmission rate. This study did show that the length of operation for abdominal subtotal

hysterectomy was significantly shorter, and that the amount of blood loss was significantly reduced, when compared to abdominal total hysterectomy. There was no difference found in either measurement in a laparoscopic procedure. The occurrence of fever post-surgery was reduced in the subtotal group, as well as the likelihood of urinary retention or incomplete emptying. The risk of ongoing cyclical bleeding was significantly increased in the subtotal group. They stated that they found no difference in sexual function, but because the studies were so dissimilar, the confidence is low in this conclusion. Finally, there was not enough information to state a conclusion on whether the likelihood of future prolapse was greater in either group.

### **3.2. Comparing newer laparoscopic approaches**

As newer laparoscopic approaches to hysterectomy become more widely used, there is new research comparing the outcomes of subtotal vs. total hysterectomy strictly through laparoscopic routes. Song et al. (2011) compared the outcomes of laparoscopic supracervical hysterectomy (LSH) and laparoscopically assisted vaginal hysterectomy (LAVH—which is always a total hysterectomy). This study used commercially available insurance claims information. It resulted in a large (6,198 LSH; 14,181 LAVH), nation-wide sample. It would be classified as a retrospective chart review. Short-term outcomes (30 days and 180 days) post-surgery were analyzed. The operative outcomes report indicated that LAVH (total) patients had significantly higher rates of infections, hematological complications, and post-surgical analgesic use. There were no differences in any other rate of mortality, injury, or complication. Post-surgery (through 180 days), it was reported that LSH (subtotal) patients had significantly lower rates of intensive care unit (ICU) stays, emergency room (ER) visits, inpatient readmissions, and outpatient clinic visits. The total cost of insurance claims paid was significantly lower for LSH (subtotal) patients than for LAVH (total) patients.

Another study compared LSH to TLH. Cipullo, De Paoli, Fasolino, and Fasolino (2009) conducted a retrospective chart review for all women who had either of these procedures for the benign condition in a single site over a 12-month period. Patients who had any concurrent procedures were excluded. In the LSH group, there was a significantly shorter operative time and lower hemoglobin drop. There were also a significantly lower number of major complications, defined as bowel, bladder and ureteral injuries, blood transfusions, thrombosis, significant vaginal bleeding, and the need to return to surgery. The researchers acknowledge that the study was limited because it was not a randomized controlled trial, but they believed that given the significant differences in the operations, that it would be unethical to randomize.

Bardens (2012) also compared the short-term outcomes of LSH to those of TLH. This was also a single-center retrospective chart review. Unlike Cipullo et al. (2009), it included concurrent procedures. The only exclusion was cancer, but it did not exclude precancerous conditions of the cervix. The sample included 92 women who underwent LSH and 108 women who underwent TLH. The findings were no difference of blood lost or length of hospital stay. The length of operative time was significantly longer for TLH. The main finding was the significantly higher rate of wound healing problems, which occurred in the vaginal cuff, for the TLH group compared to the LSH group.

### **3.3. Evaluating major arguments against subtotal hysterectomy**

The likelihood of continued cyclical bleeding, pelvic pain, and cervical cancer are the most common arguments put forth against subtotal hysterectomy. Most of the research studies comparing the techniques evaluated included post-surgical bleeding. Not all defined it in the same manner. Some addressed cyclical bleeding, and others looked at any post-surgical bleeding. The most recent long-term study by Greer et al. (2010), which was already summarized, found the rate of cyclical vaginal bleeding to be 11% of those who had a subtotal procedure.

Sasaki, Cholkeri-Singh, Sulo, and Miller (2014) specifically evaluated regular bleeding after LSH. The study was a retrospective chart review from two surgeons including all patients that had an LSH for a nine-year period ( $n = 256$ ). Of the total sample, 11.2% of the women reported any post-operative bleeding starting or continuing after 12 weeks (p. 4). Younger patients and patients with

endometriosis were much more likely to experience bleeding after 12 weeks than patients with any other diagnosis. For those with bleeding, most were treated with just observation (51.7%), other with an in-office silver nitrate treatment (27.6%), and only 2 (or 6.9%) had a trachelectomy (removal of the cervical stump).

Lieng, Lømo, and Qvigstad (2010) also evaluated cyclical bleeding in both LSH and SAH patients. This was a single-site retrospective study of all women who underwent LSH ( $n = 240$ ) or SAH ( $n = 106$ ) in single hospital in Norway over a two-year period. Regular vaginal bleeding was reported in 17% of the SAH group and 24% of the LSH group reported cyclical vaginal bleeding. However, all women who reported cyclical bleeding indicated that it was minimal and not considered bothersome. Regarding pelvic pain, all women reported a significant reduction of pain after surgery, but those that had a hysterectomy for endometriosis reported higher levels of pelvic pain after surgery compared to those who had hysterectomies for other reasons.

One of the major reasons given in opposition of subtotal hysterectomy is the possibility of cervical cancer. None of the studies in the review reported any incidences of cervical cancer. They were likely not large enough sample sizes, and not long enough timeframes. Even the most comprehensive recent Cochrane review concludes that there is insufficient evidence to evaluate this risk (Lethaby et al., 2012).

### **3.4. Provider opinions and informed consent**

According to Lieng et al. (2010), previously summarized, women who reported being satisfied with the preoperative information that they were given were more likely to report being satisfied with the results of their surgery. However, the research does suggest that many women are not being given comprehensive preoperative information. Zekam et al. (2003) surveyed 1,647 gynecologists in the United States (Washington DC, Maryland, and Virginia area). The response rate was 51.2%. Of those respondents, only 17.8% stated that they always counsel women about the pros and cons of subtotal vs. total hysterectomy and 63% indicated that they either rarely or never did. Only 19% offered women the choice between total and subtotal hysterectomy, the rest rarely or never did.

While Zekam et al. (2003) is an older research, it is the only research of its kind. There was an additional older study that was also the only one of its kind. Esdaile, Chalian, Del Priore, and Smith (2006) surveyed 369 gynecologist oncologists at a medical conference consisting of practitioners both in the United States and the United Kingdom. Eighty-eight percent of those from the United Kingdom stated that they would perform a subtotal hysterectomy for benign uterine conditions, and a total of 50% of those from the US would select a subtotal hysterectomy. Esdaile et al. also surveyed 370 nurses, asking each participant which type of hysterectomy she would choose, if she were personally facing hysterectomy for herself for a benign condition. Seventy-two percent of participants stated that they would choose the subtotal procedure over the total hysterectomy (Esdaile et al., 2006, p. 56).

## **4. Methods**

This literature review was conducted by searching PubMed, MEDLINE, Cochrane Library, the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Google Scholar, Ovid, and the Science Direct. Search terms included “hysterectomy,” “supracervical hysterectomy,” “subtotal hysterectomy,” and “total hysterectomy.” The literature included in this systematic review was found in peer-reviewed journals, which were published between the year 2000 and the year 2016. The majority of research considered for inclusion in this review of literature was published no earlier than 2010, with the exception of two cases in which there had been no recent studies which focused on the same specific question posed in the research which was completed in the two particular studies. One of these studies focused on the physician’s frequency of adequate patient counseling on subtotal vs. total hysterectomy by self-reporting, while the second study used a survey to determine which type of procedure physicians from the United Kingdom and United States normally performed for their patient with benign conditions, and also which type of procedure nurses would choose for

themselves if they personally had to have a hysterectomy for a benign condition. Initially, only randomized controlled studies were considered for inclusion. However, because of the limited availability of these studies, the search was expanded to include other types of quantitative studies. Furthermore, only English, or English-translated, studies were included.

The literature available was limited. Only 42 studies met the inclusion criteria from the entire 2000–2016 period. Of the total, the majority of studies was published prior to 2010, and most were retroactive chart reviews. Furthermore, the majority of studies found were single-site studies and studies with small sample sizes.

## 5. Discussion

### 5.1. Current general state of knowledge

While total or subtotal hysterectomy has the potential to make a significant impact on many women's lives, the current state of knowledge regarding which type of procedure is best for various benign conditions is lacking. Almost all of the research had small sample sizes and low power. The majority of studies was retrospective analyses, and not randomized controlled trials. Results were contradictory in many cases. The two most recent randomized controlled trials reported opposite results. Ellström Engh et al. (2010) reported significantly better outcome from subtotal hysterectomy than from total hysterectomies for benign conditions, and Greer et al. (2010) reported no significant difference in major outcomes when comparing total to subtotal hysterectomies for benign conditions.

In the US, provider information such as “Up-to-Date,” and practice guidelines, such as those published by the American Congress of Obstetricians and Gynecologists are all relying on the most recent Cochrane systematic review by Lethaby et al. (2012), which concluded that there was no difference between the two procedures for all of the major outcomes. However, even the study authors acknowledged that the studies in which their meta-analysis was based were of a limited number (only nine studies were included), limited number of participants, limited power, and suffered from heterogeneity, and they would welcome additional studies in this area.

It is also indicative of the unsettled nature of this question that practitioners in several countries have come to the exact opposite conclusion. For example, most of the Scandinavian research has shown better outcomes for subtotal procedures for benign conditions, and those countries have practice guidelines that advise subtotal procedures for those situations. Some of the researchers/practitioners in these countries felt that subtotal procedures were so much more appropriate for benign conditions that it would have been unethical to conduct randomized controlled trials and subject part of the participants to unnecessary total hysterectomies. Another major limitation acknowledged by Greer et al. (2010) and Lethaby et al. (2012) was that in almost all of the studies in this area, the possible confounding variables of menopausal status and concurrent bilateral oophorectomy had not been controlled.

Advances in laparoscopic surgical techniques have led to rapidly increasing numbers of cases in the area of hysterectomy. New interest in comparing laparoscopic subtotal hysterectomies is emerging, and new research is in progress in this area. The three such studies included in this review all found some significantly better major outcomes from the subtotal groups (Bardens, 2012; Cipullo et al., 2009; Song et al., 2011). There were no randomized controlled trials comparing laparoscopic techniques in the area of subtotal hysterectomy. Also, likely because of the new advent of these techniques, there have yet to be any long-term studies. This is an area lacking in research that should be addressed. There is also a trend showing increasing numbers of subtotal procedures, which should make comparative research more practical, and allow for greater sample sizes.

### **5.2. Evaluating major arguments against subtotal hysterectomy**

One of the major arguments proposed against subtotal hysterectomy is the possibility of ongoing cyclical bleeding. Two of the studies reviewed showed the rate of continued cyclical bleeding to be approximately 11% (Greer et al., 2010; Sasaki et al., 2014). Lieng et al. (2010) reported it in 17% of the SAH group and 24% of the LSH. However, the women all reported that it was minimal in amount and not bothersome. It is important that practitioners educate women on the likelihood of continued cyclical bleeding if they are considering a subtotal hysterectomy.

There is also the possibility of ongoing pelvic pain after subtotal hysterectomy for certain conditions. Lieng et al. (2010) reported that women who had subtotal hysterectomy for a diagnosis of endometriosis had significantly greater reports of a post-surgical ongoing pelvic pain than those who had the surgery for other conditions. Thus, practitioners must carefully counsel endometriosis patients about the risks of continuing pelvic pain when considering a subtotal procedure.

The level of concern that retaining the cervix will leave the continuing possibility of cervical cancer should be evaluated in light of the new cervical cancer screening guidelines. The new guidelines state that because the risk of cervical cancer is so low and that cervical cancer develops so slowly, that women aged 30–65 who have no risk factors only need a Pap test and human papilloma virus (HPV) test every five years (American College of Obstetricians & Gynecologists, 2016). Women also need to know, when making this decision, that there is still the possibility of vaginal cancer if their cervix is removed. Women may think that they do not need to be screened, or may not be told they need to be screened if they have a total hysterectomy. Also, vaginal cancer can be undetectable inside the vaginal cuff created by hysterectomy.

### **5.3. Provider opinions and informed consent**

Although the author acknowledges the far from settled debate as to which type of procedure is best regarding patient outcomes, the literature does indicate better patient satisfaction with proper patient education (Lieng et al., 2010). It is concerning that so few providers explain the advantages and disadvantages of the subtotal and total hysterectomy procedures, and that so few give their patients a choice as to which procedure she prefers to undergo. To give proper informed consent, patients need to be informed. The authors suggest further investigation into the reason that many gynecologist oncologists do recommend a subtotal hysterectomy for benign conditions (Esdaile et al., 2006).

## **6. Implications for practice**

Thoroughly educating patients who are facing hysterectomy for benign conditions regarding their options is essential to true informed consent, and also increases the likelihood of improved patient satisfaction, as well as the potential for improved patient health and quality-of-life outcomes. The understanding of benefits vs. risks of subtotal vs. total hysterectomy is likely to be a rapidly evolving area, and new research will likely be available in the near future. Providers are encouraged to use the current research, as well as to keep apprised of new research results, to counsel patients thoroughly.

## **7. Conclusion**

History has shown that the practice started with subtotal hysterectomy mainly related to technological limitations. Surgeons then moved toward the more complex surgery of total hysterectomy because of advances in antibiotics and anesthesia. The pendulum is now back to showing an increasing trend in the less invasive subtotal approach, specifically via laparoscopic approach. Perhaps things have come full-circle.

This systematic review provides enough evidence to state that there is currently not enough data available to recommend total hysterectomy for every patient in need of hysterectomy for benign conditions, and that there is the potential for an increase in risks associated with total vs. subtotal hysterectomy. Thus, the importance of informing a patient of her choice between the two procedures, and educating the patient as to the risks vs. benefits of both types of procedures using an evidence-based approach, is critical.

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#### Competing Interest

The authors declare no competing interests.

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