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Short-term recovery after subtotal and total abdominal hysterectomy - a randomised clinical trial

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1 | An original article entitled

2

3 | **Short-term recovery after subtotal and total abdominal**
4 | **hysterectomy – a randomised clinical trial.**

5

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23 | Short headline: *Short-term recovery after hysterectomy*

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24 **Abstract**

25 **Objective:** To determine whether the day-by-day postoperative recovery differs between
26 women undergoing subtotal and total abdominal hysterectomy and to analyze factors
27 associated with postoperative recovery and sick-leave.

28 **Design:** A prospective, open, randomised multicenter trial.

29 **Setting:** Seven hospitals and one private clinic in the south-east of Sweden.

30 **Population:** 200 women scheduled for hysterectomy for benign conditions were enrolled in
31 the study and 178 women completed the study. 94 women were randomised to subtotal
32 abdominal hysterectomy and 84 to total abdominal hysterectomy.

33 **Methods:** Day-by day recovery of general well-being measured by a visual analogue scale in
34 a diary seven days preoperatively and 35 days postoperatively. Psychometric measurements
35 included depression, anxiety and general psychological well-being.

36 **Main outcome measures:** Effects of operating method and preoperative well-being on the
37 day-by-day recovery and sick-leave duration.

38 **Results:** No significant difference was found in the day-by-day recovery between operating
39 methods. Day-by-day recovery of general well-being and duration of sick-leave was strongly
40 associated with the occurrence of minor complications but not with major complications. The
41 level of psychological well-being preoperatively was strongly associated with the day-by-day
42 recovery of general well-being and duration of sick-leave.

43 **Conclusions:** Day-by-day recovery of general well-being is not faster in subtotal versus total
44 abdominal hysterectomy. Independent of operation method there is an interaction between
45 preoperative psychological well-being, postoperative recovery of general well-being and
46 duration of sick-leave. Postoperative complications and preoperative psychological well-being
47 are strong determinants for duration of sick-leave. There is a need for intervention studies
48 with focus on complications and preoperative well-being.

49 **Keywords:** hysterectomy, recovery, subtotal, randomised study

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50 **Trial registration number:** NCT00876057

51 **Introduction**

52 Subtotal abdominal hysterectomy (SH) claims of gained popularity compared with total
53 abdominal (TH) for benign gynaecological disorders due to a shorter operating time, less
54 peroperative bleeding and fewer perioperative complications (1). The introduction of the
55 laparoscopic subtotal hysterectomy further increased the popularity for the preservation of the
56 cervix (2,3). Observational studies from the 1980s and 90s showed potential advantages with
57 SH compared with TH regarding sexual outcome and the postoperative general well-being
58 seemed to be better after SH compared with TH (4-6). In a meta-analysis of subtotal and total
59 hysterectomy, Gimbel stated that conclusions regarding quality of life outcome could not be
60 drawn (1). No difference has been found in postoperative recovery time between TH and SH
61 (7-9). Whether the day-by-day postoperative recovery of general well-being differs between
62 the two modes of hysterectomy has not been investigated.

63 Recovery is not only a matter of treatment of postoperative physical symptoms and
64 complications but also most likely depends on preoperative psychological well-being and
65 ability of psychological recovery (10,11). The speed of the postoperative recovery depends on
66 optimal management of postoperative symptoms such as pain, nausea and intestinal paralysis,
67 and occurrence of postoperative complications (12). In the randomised clinical trials (RCT)
68 comparing SH and TH it was only in the study by Thakar *et al.* that psychiatric symptoms
69 were measured (8,9,13,14). In these studies the main focus was set on surgical outcome and in
70 secondary analyses sexuological outcome (14-16). No analyses were done of the impact of
71 preoperative psychological well-being on the outcome measures. Some studies have shown
72 that the preoperative psychological well-being is associated with postoperative overall well-
73 being (17,18) and that personality factors such as neuroticism and coping strategies may be of

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74 importance (11,19). Whether these factors also have an impact on the postoperative day-by-
75 day recovery has not been investigated and may be of great interest in order to tailor
76 postoperative periods for patients with low levels of well-being by optimizing their physical
77 and psychological recoveries.

78 The aims of this randomised study were to determine whether the day-by-day
79 postoperative recovery differed between subtotal and total abdominal hysterectomy and to
80 analyze factors associated with the postoperative recovery and sick-leave. Our hypothesis was
81 that SH, because of its presumed less invasive character and lower complication rate, would
82 give a faster day-by-day recovery in general well-being than TH.

83 .

84 **Methods**

85 The Departments of Obstetrics and Gynaecology at seven hospitals and one private
86 gynaecological clinic in the South-East Health Regions of Sweden participated in this
87 randomised, controlled, open multicenter study of subtotal abdominal hysterectomy *versus*
88 total abdominal hysterectomy. The hospitals comprised three county hospitals, three central
89 hospitals, and one university hospital.

90 Women admitted for hysterectomy due to benign gynaecological conditions, between
91 March 1998 and April 2004, were eligible for the study. Not all of the departments were
92 actively recruiting patients during the whole period. Proficiency in Swedish was a prerequisite
93 for inclusion.

94 Medical inclusion criteria were primarily uterine fibroids with bleeding disturbance or
95 mechanical symptoms but other benign disorders where hysterectomy was recommended
96 were also included. After the operation at least one ovary should be preserved. Exclusion
97 criteria were malignancy in the genital organs, previous or present cervical dysplasia, rapidly
98 growing fibroids where malignancy could not be ruled out preoperatively, preoperative
99 treatment with GnRH analogues, postmenopausal women without hormone therapy (HT), and
100 severe psychiatric disorders.

101 The calculation of the sample size was based on the results from the Psychological
102 General Well-Being (PGWB) in a previous study (20). In order to detect a difference in
103 PGWB sum score between the two surgical methods as statistically significant we assumed
104 that an increase in PGWB sum score of 8 units was clinically relevant. Thus, to demonstrate
105 that this difference was statistically significant in 90% of the women at a 5% level (two-sided
106 testing), i.e. with a 90% power, 166 patients were necessary. We estimated the drop-out rate
107 to be 20%, thus approximately 200 patients were needed in the study. After written and verbal
108 informed consent the women were randomised to either TH or SH according to a random

109 table. The randomisation was conducted as a block randomisation with eight blocks, one for
110 each participating centre. Each block contained 26 objects with equal numbers of the two
111 surgical methods. The surgical procedure was written on a label sealed in opaque envelopes
112 which were numbered orderly in accordance with the random table. The envelopes were
113 opened consecutively. The women were assigned approximately one week before surgery and
114 informed about their assignment before surgery. If a centre could not recruit the planned
115 number of women to the study within a specified period of time, the remaining randomisation
116 envelopes were transferred to the university hospital, which recruited the remaining patients.
117 Due to a decreased inclusion rate during the last year of the inclusion period the inclusion was
118 stopped when 200 women were randomised. A total of 178 women completed the study; 94
119 allocated to SH and 84 to TH. These women constitute the study population. The flow chart
120 of women in the study is illustrated in Figure 1.

121 The study was approved by the ethics research committees of Linköping University and
122 Örebro Regional Hospital.

123 *Surgery*

124 The hysterectomy was made under general anaesthesia through a transverse or low midline
125 skin incision decided by the surgeon based on the size of the uterus or previous surgery. The
126 surgical technique of the hysterectomy was left to the surgeon's discretion. The only
127 prerequisites according to the study protocol were that the uterine cervix was dissected extra-
128 fascially and no peritonealisation was made in either SH or TH. The patients should
129 preferably receive prophylactic antibiotics with a single dose of 1.5g cefuroxim and 1g
130 metronidazol intravenously. In case of allergy to penicillin each hospital used prophylactic
131 antibiotics according to local policy.

132 Epidural analgesic was allowed per- and postoperatively according to local clinical
133 routine; otherwise standard postoperative analgesics were paracetamol (1 gram qid) and non-

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134 steroidal anti-inflammatory drugs (NSAID) administered enterally. Opioids were given
135 parenterally on need basis.

136 The patient was discharged from the hospital when she was mobilized and had
137 sufficient pain relief with oral analgesics. At discharge the patient had a sick-leave of 21 days.
138 The research nurse contacted the patient regarding general well-being approximately ten days
139 after discharge and then once weekly until the patient considered she had recovered. The sick-
140 leave was prolonged with at most seven days at a time if necessary, until the patient was able
141 to return to work.

142 The patient visited the outpatient clinic at five weeks. A clinical examination was
143 carried out and data on postoperative complications and *de facto* period of sick-leave were
144 recorded.

Measurement of General well-being

146 Starting one week before surgery and continuing daily until day 35 postoperatively, the
147 women completed a diary concerning their general well-being. In a visual analogue scale
148 ranging from 0 – 100 they were asked to state how they considered their overall general well-
149 being on average for the past day. Zero represented extremely bad well-being and 100
150 represented feeling extremely well. Furthermore, the women were asked to report their
151 consumption of analgesics after discharge in the diary.

Psychological measures

153 Psychological functioning was measured approximately one week preoperatively by the
154 psychometric tests. In order to measure the psychological general well-being the
155 Psychological General Well-Being (PGWB) and the Women Health Questionnaire (WHQ)
156 were used. These are validated instruments for that purpose (21-23). The State-Trait Anxiety
157 Inventory (STAI) and the Beck's Depression Inventory (BDI) were also used for measuring

158 specific psychological functioning. The STAI and the BDI tests were chosen so that changes
159 regarding anxiety and depression specifically could be detected.

160 The PGWB index was constructed to measure personal affective states reflecting well-
161 being or distress. It consists of 22 questions referring to anxiety, depression, well-being, self-
162 control, health and vitality (21). Each question is rated on a six point scale from 1 to 6. The
163 sum score ranges from 22 to 132. The higher the sum score, the higher degree of well-being.
164 The PGWB has been tested for validity against various validated mental health scales. Its
165 Swedish version has also been validated (22).

166 The WHQ is a questionnaire providing a detailed examination of minor psychological
167 and somatic symptoms experienced by peri- and postmenopausal women (23). It consists of
168 36 questions grouped in nine sections describing somatic symptoms, depressive mood,
169 cognitive difficulties, anxiety, sexual function, vasomotor symptoms, sleep problems,
170 menstrual symptoms and attraction. Each question is rated from 1 to 4 and the sum score
171 ranges from 36 to 144. A higher sum score indicates more distress and dysfunction. The
172 Swedish translation of the WHQ has been validated (24).

173 STAI is a questionnaire that assesses anxiety in two different forms representing state
174 and trait. In this study the trait form is used. The trait form (Y-2) consists of 20 statements
175 that evaluate how respondents feel “generally” (25). Individuals respond to each item on a
176 four-point Likert scale, indicating the frequency with which each strategy is used. The sum
177 score ranges from 20 to 80 and the sum score increases in response to physical danger and
178 psychological stress. The STAI has been widely used in assessing general anxiety in medical,
179 surgical and psychiatric patients and has been translated to Swedish but not validated for
180 Swedish circumstances.

181 The BDI is a quantitative self-report scale for measuring the presence and severity of
182 depression in clinical and normal populations of adults and adolescents (26). It is made up of

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183 21 items. Each item is rated on a four-point scale (0 – 3) in increasing severity, adding up to a
184 total score range from 0 to 63. A high sum score indicates a more depressive state. The BDI
185 has been translated to, but not validated for Swedish circumstances.

186

Statistics

187 All analyses were performed according to intention-to-treat principles. For the analyses of the
188 descriptive and demographic data, Student's t-tests were used for continuous data
189 demonstrating approximately normal distribution. Yates-corrected χ^2 and Fisher's exact test
190 were used for nominal data. Analysis of variance (ANOVA) for repeated measurements was
191 used to compare the results of general well-being and psychological measurements between
192 the two groups. Statistical significance was accepted at the 5% level.

194 On the basis of data from previously published articles concerning psychometric
195 measurements and day-by-day recovery of general well-being after hysterectomy (11,20), as
196 well as empiric considerations, we estimated that median preoperative sum scores in PGWB,
197 WHQ, and STAI ,101, 61 and 33, respectively, could be discriminatory for high and low
198 capability of postoperative recovery. These values are in the range of preoperative mean
199 values in previously published materials of women undergoing benign hysterectomy or
200 women who are perimenopausal (11,20,22,25,27). For BDI we used the 75-percentile value of
201 our study group i.e. 9, which is equivalent to the discriminatory value of BDI for normal and
202 mild depressive states (28).

203

204 **Results**

205 The demographic and clinical data as demonstrated in Table 1 did not differ significantly
206 between the groups. Concerning perioperative data, the operating time was significantly
207 longer and prophylactic antibiotics more frequently used in TH than in SH. Otherwise, no
208 significant differences were observed in the perioperative data shown in Table 2. One woman,
209 allocated to TH had a SH for surgical technical reasons.

210 The use of analgesics is shown in Table 2. No significant differences were observed
211 between the groups in use of parenterally or enterally administered analgesics even when
212 adjusted for use of epidural analgesia. None of the women received opioids parenterally after
213 postoperative day 4.

214 *Association between day-by-day recovery of general well-being and mode of hysterectomy*

215 An illustration of the recovery of day-by-day general well-being is shown in Figure 2. The
216 ANOVA for repeated measurements revealed that day-by-day general well-being did not
217 differ significantly between the hysterectomy groups in the preoperative and postoperative
218 periods ($p=0.9010$ for main effect between the groups in the preoperative period and $p =$
219 0.5048 for the postoperative period). There were highly significant main effects over time (p
220 < 0.0001) for the preoperative as well as the postoperative periods. In the preoperative period
221 the general well-being deteriorated day-by-day and in the postoperative period it improved.
222 For the postoperative period a significant interaction effect was observed ($p = 0.0029$). As
223 illustrated in Figure 2, the speed of recovery was initially higher for women in the SH group
224 than for TH group but later on in the postoperative period it was *vice versa*. For the
225 postoperative period this holds true even when adjusted for analgesics and complications, but
226 in women with complications the interaction effect disappeared. The women had regained
227 their self-rated general well-being equivalent to the mean value of the entire study population

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228 of preoperative day -7 on postoperative day 22 in the SH group compared with on day 19 in
229 the TH group.

230 The complications are described in Table 3. Minor complications included abdominal
231 wound infection or seroma; vaginal cuff infection; cervicitis; lower urinary tract infection;
232 prolonged period with pain; fatigue and other conditions occurring in the postoperative period
233 causing substantial, but not severe discomfort to the patient. Major complications consisted of
234 per- or postoperative intra-abdominal bleeding exceeding 1000ml; blood transfusion;
235 respiratory depression; re-laparotomy and re-admittance due to subileus.

236 The surgery and postoperative period was uncomplicated in 68 women (72%) in the SH
237 group and 64 (76%) in the TH group. Major complications occurred in seven women (7.4%)
238 in the SH group and in four (4.8%) in the TH group. The corresponding figures for minor
239 complications were 19 (20.2%) and 17 (20.2%), respectively. None of these differences
240 reached statistical significance.

241 *Factors associated with postoperative recovery of day-by-day general well-being.*

242 The postoperative day-by-day general well-being was strongly negatively associated with
243 occurrence of complications (ANOVA for repeated measurements: $p = 0.0004$ for main effect
244 between groups, $p < 0.0001$ for main effect over time and no significant interaction). This was
245 mainly attributed to minor complications whereas no significant association was observed for
246 major complications. The self-rated general well-being equivalent to the mean value of
247 preoperative day -7 of the entire study population was regained on postoperative day 28 when
248 complications had occurred compared with day 18 when no complications occurred.

249 The category outcome measures of the psychometric tests (low vs. high) were all
250 strongly associated with the recovery of postoperative day-by-day general well-being.
251 However, there were also strong associations with preoperative general well-being for all four
252 psychometric tests. The results of the ANOVA tests for repeated measurements of pre- and

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253 postoperative general well-being and the psychometric tests including estimation of time of
254 regained general well-being equivalent to the self-rated general well-being on preoperative
255 day -7 are presented in Table 4.

Sick-leave

257 The 25-percentil of duration of sick leave was 27 days. The duration of sick leave was also
258 strongly associated with recovery in terms of day-by- day general well-being postoperatively
259 (ANOVA for repeated measurements: $p < 0.0001$ for main effect between the groups with
260 sick leave less than 28 days and 28 or more days, $p < 0.0001$ for main effect over time; and p
261 = 0.0440 for interaction effect) which means that those with a shorter sick leave rated their
262 day-by-day general well-being higher and thus had a faster recovery than those with a longer
263 sick leave.

264 The sick leave was strongly associated with occurrence of complications (40 ± 13 days
265 with complications vs. 31 ± 8 days without complications; $p < 0.001$). This was in particular
266 attributed to occurrence of minor complications (42 ± 14 days with minor complications vs.
267 31 ± 8 without minor complications) whereas occurrence of major complications did not
268 influence the duration of sick leave significantly (36 ± 11 days with major complications vs.
269 33 ± 10 days without major complications).

270

271 **Discussion**

272 This study showed no difference in the day-by-day recovery of self-reported general well-
273 being between women undergoing subtotal or total abdominal hysterectomy. No major
274 differences were observed in perioperative clinical data or complications except for a
275 statistical significant longer operation time for total hysterectomy. The day-by day recovery of
276 the general well-being and the duration of sick-leave were strongly associated with
277 occurrence of minor complications and the preoperative psychological well-being.

278 The present study was randomised which eliminate most selection bias. However,
279 women who accept to participate in randomised clinical trials constitute *per se* a selected
280 group. They may have specific reasons for participation which can constitute a selection bias
281 and thus influence the results. The reasons for participation or renounce participation have not
282 been investigated in this study. This should be kept in mind when the results are generalised.
283 The inclusion period in the study was six years. This was somewhat longer than the 2.5 – 4
284 years of inclusion periods in the other randomised trial of subtotal and total abdominal (7-
285 9,13). However, the proportion of enrolled women versus eligible women in this study was
286 similar to that in other randomised studies of subtotal and total hysterectomy (8,9).

287 The use of a visual analogue scale (VAS) to measure the general well-being may seem
288 to be a crude method. However, the method has been used in several studies of hysterectomy
289 concerning quality of life assessments and general well-being (20,29,30) and found to be
290 useful. A similar VAS scale is used in the EQ5-D, which is a well accepted standardised
291 instrument for use as a measure of health outcome (31). In order to detect changes in
292 psychological well-being we used four validated tests, two generic and two specific. These
293 tests have been used in several clinical trials and have been found useful in describing
294 changes in psychological well-being after treatment. Normative clinical values have been
295 proposed for the specific tests i.e. BDI and STAI (25,28) whereas no such values exist for

296 PQBW and WHQ. In order to discriminate between low and high levels of psychological
297 well-being we therefore used these established values to discern between normal and
298 pathological states for the BDI and STAI. For PGWB and WHQ we used the median sum
299 score values of the study population. These scores are similar with mean sum score values of
300 other populations in studies of benign hysterectomy or perimenopausal women (20,22,32,33).
301 We excluded women with severe psychiatric disorders in our study to avoid the bias of
302 psychiatric disease on psychological recovery after hysterectomy. The study population thus
303 represents a "psychologically" healthy group of women and it may therefore be reasonable to
304 establish "cut-off" limits at the median value of the sum scores of the generic tests to
305 distinguish between low and high level of psychological well-being.

306 Duration of sick leave is usually not strictly determined by medical decisions. Social
307 welfare benefits, local traditions, personal causes, work load and attitudes of the health care
308 system may also influence. In the present study the women had an initial sick leave of 21
309 days. The research nurse had telephone contact with the patient weekly and sick leave was
310 prolonged with up to seven days intervals per patient request if she did not feel well enough to
311 return to work. In case the sick leave exceeded 35 days the patient was appointed to visit the
312 doctor in order to be examined and evaluated for further prolongation of the sick leave and to
313 receive treatment if necessary. The duration of the sick leave was in this way more likely
314 determined by the woman's experience of the recovery.

315 The randomisation worked well with no significant differences in preoperative data
316 between the two groups. The operation time was statistically significantly longer in the total
317 hysterectomy group which is in accordance with other studies (1,34). However, the difference
318 was only 10 minutes, which makes the clinical importance limited. Contrary to the meta
319 analysis by Gimbel and the Cochrane Review no difference was found in peroperative
320 bleeding between subtotal and total hysterectomy. Prophylactic antibiotics were used

321 significantly less often in the subtotal hysterectomy group. This might influence the risk of
322 postoperative infections (35), but no such increase was observed in this study.

323 Use of postoperative analgesics was similar in the two groups. Provided that the demand
324 of pain relief was equivalent, this indicates that postoperative pain might be equal after
325 subtotal and total hysterectomy. It seems reasonable to assume this since the day-by-day well-
326 being did not differ. The complications and complication rates did not differ between the
327 modes of hysterectomy. According to the meta-analysis by Gimbel subtotal hysterectomy was
328 encumbered with fewer complications. This was strongly attributed to the lower frequency of
329 pyrexia as reported in the study by Thakar *et al.* In our study we did not register pyrexia *per*
330 *se* as a complication. It was only registered as a complication when associated with infectious
331 morbidity. The rates of complications in the present study are in line with those described in
332 the other RCT of subtotal and total hysterectomy (1).

333 The day-by-day recovery of general well-being did not differ between the two groups
334 even when adjusted for use of analgesics. Although it has been a common belief among
335 women and gynaecologists favouring subtotal hysterectomy that it should be more favourable
336 for the woman even concerning recovery with less complications and pelvic organ
337 dysfunction there is a lack of information about this in the literature (36,37). The results of
338 this study may indicate that the surgical trauma and stress is similar for the two methods and
339 that subtotal hysterectomy thus cannot be considered as less invasive or more lenient to the
340 woman than total hysterectomy.

341 Regarding the association between sick-leave and complications, these results are in the
342 line with a previous study from our group (11). Major complications, often bleeding or a re-
343 operation arise in the operating room or in the immediate postoperative period. If adequately
344 managed they seldom have an impact after two or three weeks postoperatively. This is in
345 contrast with minor complications, as for instance a wound infection arising in the

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346 postoperative period when the woman is back in her domestic environment trying to return to
347 daily life.

348 The psychometric measurements showed strong associations with postoperative
349 recovery, i.e. women who scored low in these tests recovered more slowly. The psychological
350 well-being is of importance for the length of the recovery period and it seems important to
351 preoperatively identify women with low psychological well-being in order to give extra
352 support to minimize the period of recovery and improve well-being. Our findings support the
353 view that consequences of hysterectomies are more likely to be predicted on the basis of
354 psychological traits that existed before the operation (16,38). Whether this has its reason in
355 different premorbid personalities or is caused by preoperative stress or by symptoms that
356 indicates the hysterectomy is still unclear. There are some data indicating that personality
357 factor such as neuroticism and stress coping ability seems to be of importance (10,11,39).
358 Work has been done trying to create psychological models to understanding the mechanisms
359 behind the link between gynaecological and psychological symptoms (19) but the answer still
360 remains unclear. Since the rise of the RCT-era most studies have concerned comparison of
361 outcome between different modes of hysterectomy, but maybe the solution to the enigma of
362 the link between gynaecology and psychological symptoms lies more profound in the person
363 that we call the patient.

364 In conclusions, day-by-day recovery of general well-being SH and TH is equal.
365 Occurrence of postoperative complications and low preoperative level of psychological well-
366 being impair the postoperative recovery significantly and prolong the duration of sick-leave.
367 Further studies should be encouraged to determine the impact of intervention strategies on the
368 recovery of women with low psychological capacity after hysterectomy. Also, besides, efforts
369 should be executed to reduce postoperative complications, especially minor complications, in
370 order to improve recovery.

371

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384 **Disclosure of interests**

385 None of the authors or study group reports any conflict of interest concerning this study.

386 **Contribution to Authorship**

387 PP and PK planned the study, collaborated in the surgical procedures and clinical follow-up.
388 PP, PK and JB analysed the data. PP was the primary author of the manuscript. All the
389 authors revised the paper and approved the final version.

390 **Details of ethical approval**

391 The study was approved by the ethics research committees of Linköping University and
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396

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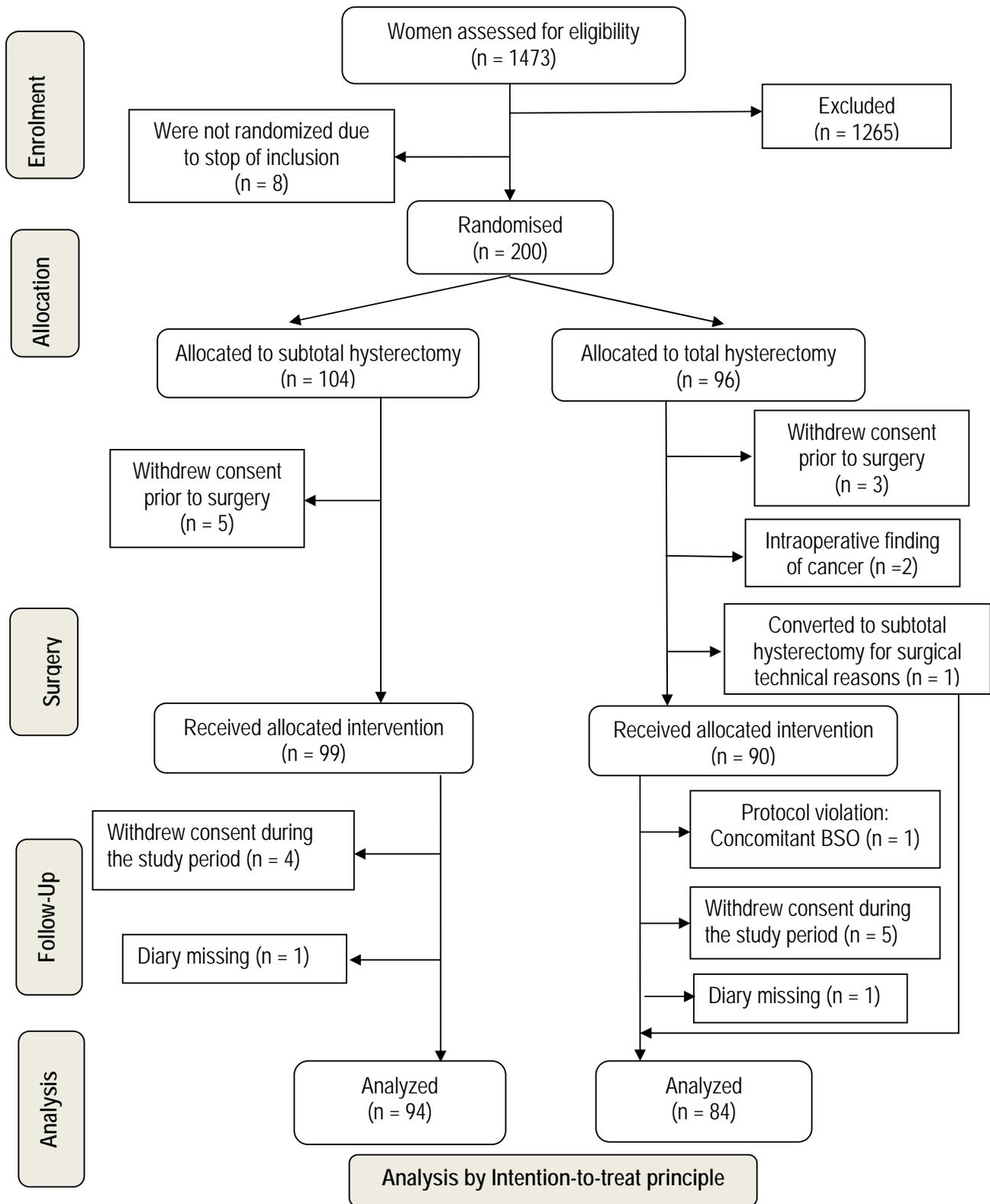


Figure I. Flowchart of the study participants. The number of women assessed for eligibility corresponds to the total number of hysterectomies on benign indications performed in the participating hospitals during the study period. Hysterectomies carried out in association with operations for benign ovarian tumours or genital prolapse are not included. No systematic information was collected during the study regarding reasons for choosing not to enrol in the study.

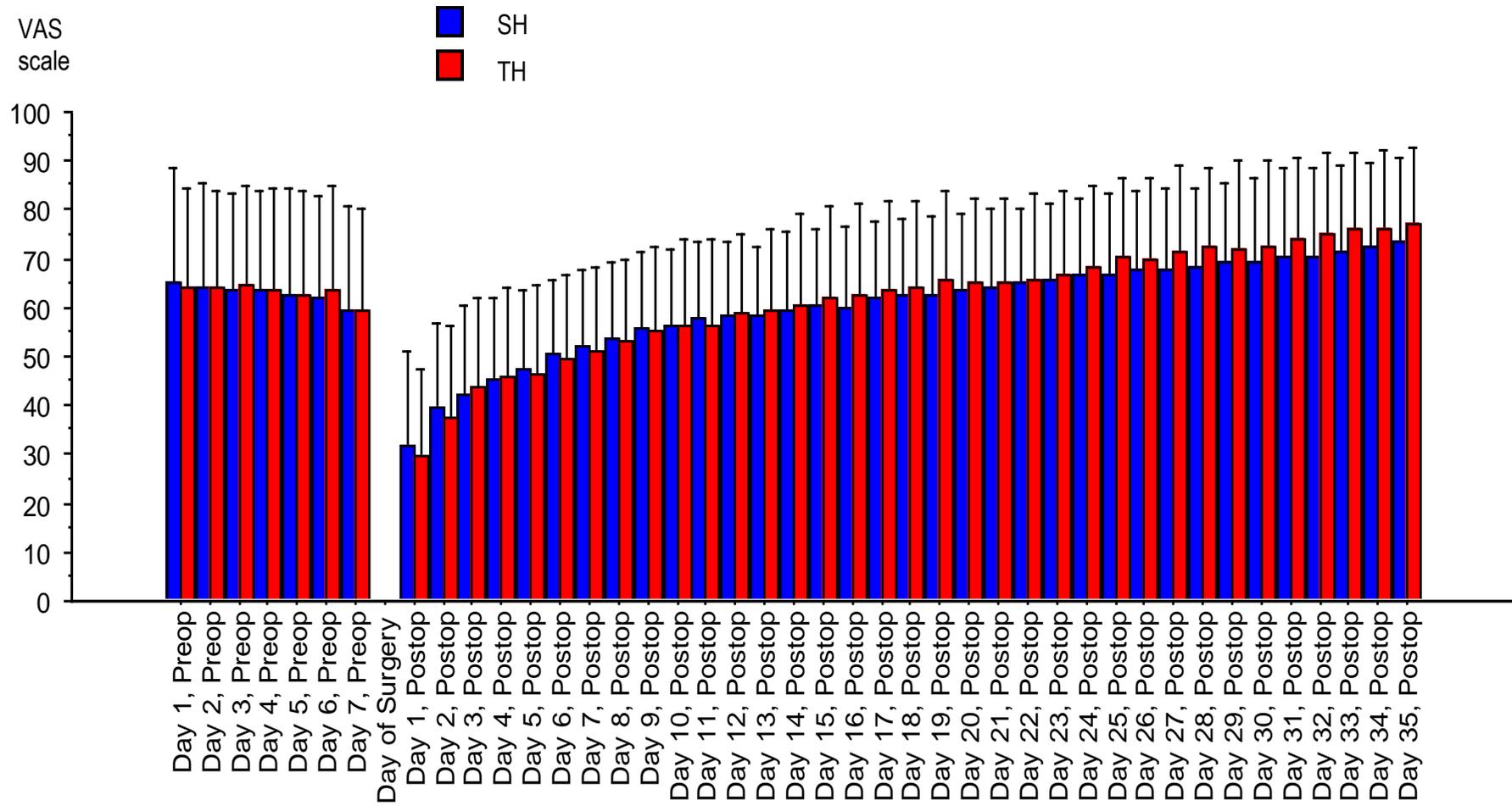


Figure 2. Illustration of the self-rated general well-being according to the diary one week prior to surgery and 35 days postoperatively. Bars represent mean \pm SD.

Table 1. Preoperative demographic and clinical data.

	Subtotal abdominal hysterectomy (n=94)	Total abdominal hysterectomy (n=84)
Age (years)	45.9 ± 5.0	45.7 ± 5.1
Gravida (no.)	2.8 ± 1.4	2.7 ± 1.4
Parity (no.)	2.2 ± 1.0	2.0 ± 1.1
Nulliparous (no. of women)	8 (8.5%)	7 (8.3%)
BMI (kg/m ²)	25.7 ± 3.6	25.8 ± 4.3
BMI < 25 (no. of women)	44 (47%)	40 (47%)
BMI ≥ 25 and < 30 (no. of women)	36 (38%)	30 (36%)
BMI ≥ 30 (no. of women)	14 (15%)	14 (17%)
Smokers (no. of women)	25 (27%)	23 (28%)
Previous laparotomy in lower abdomen (no. of women)	40 (43%)	28 (33%)
<i>Present medication</i>		
Antidepressants (no. of women)	2 (2.1%)	4 (4.8%)
Analgesics ((no. of women)	13 (13.8%)	12 (14.3%)
HT climacterium (no. of women)	7 (7.4%)	3 (3.6%)
HT bleeding disturbances (no. of women)	7 (7.4%)	12 (14.3%)
Hormonal contraceptives (no. of women)	9 (9.6%)	12 (14.3%)
<i>Main indication of hysterectomy</i>		
Bleeding disturbances (no. of women)	65 (69%)	62 (74%)
Mechanical symptoms (no. of women)	21 (22%)	15 (18%)
Dysmenorrhea/endometriosis//pelvic pain (no. of women)	8 (9%)	7 (8%)

Data are expressed as mean ± 1 standard deviation or number and (%).

BMI = body mass index; HT = hormone treatment

Table 2. Perioperative data.

		Subtotal abdominal hysterectomy (n=94)	Total abdominal hysterectomy (n=84)
Skin incision	Midline (no.)	17 (18%)	17 (20%)
	Low transverse (no.)	77 (82%)	67 (80%)
Operating time (minutes)		70 ± 23	80 ± 28 #
Uterine weight (g)		456 ± 332	440 ± 300
Blood loss (ml)		222 ± 236	243 ± 201
Blood loss per time unit (ml/h)		175 ± 138	173 ± 128
Blood transfusion (no. of women)		5 (5.3%)	3 (3.6%)
Haemoglobin preoperative (g/l)		128 ± 13	126 ± 15
Haemoglobin postoperative (g/l)		110 ± 17	108 ± 16
EVF preoperative (%)		39 ± 4	38 ± 4
EVF postoperative (%)		33 ± 5	32 ± 5
Intravenous fluids per/postoperatively (l)		3.9 ± 1.5	4.0 ± 1.3
Prophylactic antibiotics (no. of women)		81 (86%)	83 (99%) ¥
Duration of hospital stay (days) †		3.4 ± 1.2	3.4 ± 1.1
Duration of sick-leave (days)		32.5 ± 9.4	33.6 ± 11.3
Epidural analgesia (no. of women)		24 (26%)	24 (29%)
Analgesics			
Parenteral and enteral opioids (mg) *	Postop day 1	15.8 ± 14.2	17.9 ± 16.7
	Postop day 2	7.7 ± 9.5	9.2 ± 13.3
	Postop day 3	3.9 ± 5.2	4.2 ± 7.9
	Postop day 4	2.6 ± 3.8	2.2 ± 3.9
	Postop day 5	1.8 ± 3.1	1.9 ± 3.4
Enteral non-opioids analgesics (RDD) **	Postop day 1	1.0 ± 0.4	1.1 ± 0.5
	Postop day 2	1.0 ± 0.4	1.0 ± 0.5
	Postop day 3	0.8 ± 0.5	0.9 ± 0.5
	Postop day 4	0.7 ± 0.5	0.7 ± 0.5
	Postop day 5	0.6 ± 0.5	0.6 ± 0.5

Data are expressed as mean ± 1 standard deviation or number and (%).

Haemoglobin and EVF postoperative are measured on postoperative day 2 or prior to blood transfusion.

p = 0.0085. ¥ p = 0.0015.

†From day of surgery to the day of discharge

*in equipotent morphine dosage

** in sum of recommended daily dosage (RDD)

Table 3. Per- and postoperative complications.

	Subtotal abdominal hysterectomy (n=94)	Total abdominal hysterectomy (n=84)
<i>Complications during hospital stay:</i>		
Peroperative bleeding exceeding 1000 ml	3 (3.2%)	0 (0%)
Re-operation, postoperative intraabdominal bleeding	1 (1.1%)	0 (0%)
Postoperative bleeding causing blood transfusion	4 (4.3%)	3 (3.6%)
Postoperative bleeding treated conservatively	0 (0%)	2 (2.4%)
Unspecified infections treated with antibiotics	2 (2.1%)	2 (2.4%)
Respiratory depression (side effect of opioids)	0 (0%)	1 (1.2%)
<i>Complications within 5 weeks after discharge from hospital:</i>		
Wound infection/seroma	8 (8.5%)	6 (7.1%)
Vaginal cuff infection/cervicitis	1 (1.1%)	1 (1.2%)
Lower urinary tract infection	5 (5.3%)	3 (3.6%)
Abdominal/pelvic pain	4 (4.3%)	3 (3.6%)
Fatigue	2 (2.1%)	2 (2.4%)
Subileus	0 (0%)	1 (1.2%)
Other complications †	3 (3.2%)	2 (2.4%)

Data are expressed as mean \pm 1 standard deviation or number and (%).

† Other complications consist of unspecified neuralgia, diarrhoea and sore throat.

A woman may have more than one complication.

Table 4. Associations between day-by-day general well-being pre- and postoperatively and the four psychometric measurements in the entire study population.

Outcome measure	Comparison between	Timing	Repeated measures ANOVA			Postoperative day when self-rated general well-being was regained ‡			
			Main effect between groups	Main effect over time	Interaction	Category	Day	Category	Day
General well-being	PGBW low vs. high	Preoperative day -7 to day -1	$p < 0.0001$	$p = 0.0001$	$p = 0.6911$				
		Postoperative day 1 to day 35	$p = 0.0003$	$p < 0.0001$	$p = 0.8503$	PGBW high:	Day 17	PGBW low	Day 28
General well-being	WHQ high vs. low	Preoperative day -7 to day -1	$p < 0.0001$	$p = 0.0001$	$p = 0.2778$				
		Postoperative day 1 to day 35	$p = 0.0004$	$p < 0.0001$	$p = 0.9879$	WHQ low:	Day 17	WHQ high:	Day 28
General well-being	BDI high vs. low	Preoperative day -7 to day -1	$p < 0.0001$	$p = 0.0199$	$p = 0.1860$				
		Postoperative day 1 to day 35	$p = 0.0010$	$p < 0.0001$	$p = 0.8597$	BDI low:	Day 18	BDI high:	Day 31
General well-being	STAI high vs. low	Preoperative day -7 to day -1	$p = 0.0001$	$p = 0.0002$	$p = 0.0819$				
		Postoperative day 1 to day 35	$p = 0.0050$	$p < 0.0001$	$p = 0.9974$	STAI low:	Day 18	STAI high:	Day 26

‡ The self-rated general well-being equivalent to the mean value of preoperative day -7 of the entire study population.

PGBW low vs. high: sum score of PGBW \leq or $>$ than 101; WHQ high vs. low: sum score of WHQ \geq or $<$ than 62; BDI high vs. low: sum score of BDI $>$ or \leq than 9; STAI high vs. low: sum score of STAI $>$ or \leq than 33.