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Health-related quality of life after risk-reducing hysterectomy: a randomised vignette study

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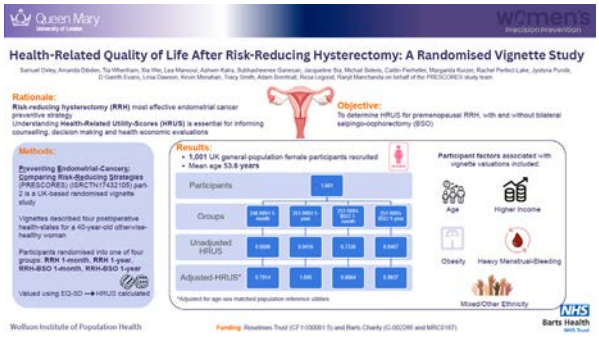
HIGHLIGHTS

- Risk-reducing surgery for endometrial cancer prevention does not impact quality-of-life.
- When combined with ovarian cancer prevention, there is only a minimal impact on quality-of-life.
- These quality-of-life scores can be used for health-economic analysis of cancer prevention.

GRAPHICAL ABSTRACT



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ABSTRACT

Background. Risk-reducing hysterectomy (RRH) is the most effective endometrial cancer preventive strategy. Understanding health-related quality-of-life using health-related utility-scores (HRUS) is essential for counselling, shared decision-making, and informing health-economic evaluations of endometrial cancer prevention. This study aimed to determine HRUS for premenopausal RRH, with and without bilateral salpingo-oophorectomy (BSO).

Methods. Preventing Endometrial-Cancers: Comparing Risk-Reducing Strategies (PRESCORES) (ISRCTN17432105) part-2 is a UK-based randomised vignette study. Following a robust development process, vignettes described four postoperative health-states for a 40-year-old otherwise-healthy woman: "RRH at 1-month", "RRH at 1-year", "RRH-BSO at 1-month", "RRH-BSO at 1-year". These were valued using EQ-5D by participants recruited from the UK general-population and HRUS calculated. Utilities were subsequently adjusted by age-and sex-matched general-population reference values. Association of variables was explored with ordinary-least-squares regression with non-parametric bootstrapping.

Findings. Overall, 1001 women were included and randomised to 1-of-4 groups. The mean-age(±SD) was 53.6 (±11.4) years. Mean(±SD) HRUS were 0.942 (±0.072) for "RRH at 1-year", 0.841 (±0.137) for

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"RRH-BSO at 1-year", 0.670 (±0.149) for "RRH at 1-month", and 0.733 (±0.190) for "RRH-BSO at 1-month", with significant difference between each group ($p < 0.001$). Adjusting for age-sex-matched population reference utilities, HRUS were 1.000(95% CI:1.00–1.00), 0.994(95% CI:0.97–1.00), 0.866(95% CI:0.84–0.90) and 0.791(95% CI:0.77–0.81), respectively. Participant factors associated with vignette valuations included age, obesity, heavy menstrual-bleeding, higher income and mixed/other ethnicity.

Conclusion. This randomised study provides HRUS following premenopausal RRH with and without BSO at two postoperative time-points, with adjustment against the age-and sex-matched general reference-population. These values are of relevance for informing counselling of women at increased endometrial cancer-risk regarding RRH and for health-economic evaluations.

1. Introduction

Endometrial cancer (EC) is the sixth-most common cancer in women internationally, and cases are expected to increase by 53% by 2040 [1]. EC is associated with a number of non-genetic and genetic risk factors; these include obesity, type-2 diabetes mellitus, the metabolic syndrome, reproductive factors, family-history, and cancer-predisposing syndromes such as Lynch Syndrome (LS) [2,3]. With the advent of risk-prediction tools incorporating these to provide personalised EC-risk estimates, it is expected that many more women at increased EC-risk will be identified in future [4].

For women at increased EC-risk, risk-reducing hysterectomy (RRH) is the gold-standard preventive strategy, providing ~100% risk-reduction [5]. RRH is recommended to high EC-risk women with LS for EC prevention after completing childbearing, along with bilateral salpingo-oophorectomy (BSO) to reduce the concomitant ovarian cancer (OC) risk, depending in part on the woman's age in relation to natural menopause [6]. RRH is associated with a risk of surgical complications and possible detrimental impact on quality-of-life (QoL) [7]. For premenopausal women the potential impact is far greater. RRH without BSO may result in an earlier age of natural menopause of up to 3.7 years [8] whereas RRH-BSO leads to surgical menopause with significant vasomotor symptoms for a majority, along-with long-term detrimental health consequences such as sexual dysfunction, heart disease and osteoporosis for a number of women [9,10]. Hormone-replacement-therapy (HRT) is indicated and helps alleviate symptoms but not to the pre-surgical level with ovaries in-situ [11]. Additionally, there is a definitive end to natural fertility. Given the tubal origin of high-grade serous carcinoma, in modern practice bilateral salpingectomy commonly accompanies hysterectomy with ovarian conservation for any indication [12]. In this manuscript "RRH" denotes hysterectomy with or without bilateral salpingectomy and with ovarian conservation, and "RRH-BSO" denotes hysterectomy with bilateral salpingo-oophorectomy.

Women considering risk-reducing surgery must weigh the benefits of cancer prevention against the potential impact on QoL. It is therefore essential that accurate information on QoL after RRH is available for women who may be diagnosed at increased EC-risk from any risk-factor. QoL can be described using health-related utility-scores (HRUS), on a spectrum with '1' representing perfect QoL to '0' representing death, which are used to calculate quality-adjusted life-years (QALYs). These are essential for health-economic evaluations of EC prevention used by clinical guidelines, and can inform the development of patient decision aids and support framing of recommendations around clinical counselling [13,14]. Utility-scores can also enable modelling for defining preventive risk thresholds [15,16], which may inform subsequent guidance/practice (e.g. in ovarian cancer) [17–19].

No previous study has reported HRUS following RRH, despite its importance in decision making, need for health-economic evaluations [20], and being identified as a research priority by policy makers such as the National-Institute of Health and Care-Excellence (NICE) [21]. A major challenge is in identifying the utility of RRH separate from that of combined RRH-BSO. Premenopausal RRH without BSO is not currently performed at scale [22], as RRH is predominantly performed for women with Lynch Syndrome. These women are mostly recommended to undergo RRH with concomitant BSO to reduce their elevated risk of both endometrial and ovarian cancer, or for *PMS2* carriers to undertake RRH without BSO around the age of natural menopause [6,23]. There is therefore no sufficiently large cohort of patients who have undergone premenopausal RRH without BSO from which quality of life outcomes and utilities could be directly derived. Furthermore, a Lynch Syndrome cohort would be a poor surrogate for the isolated utility of RRH, due to their quality-of-life being influenced by their substantially elevated risks of other cancers including colorectal cancer, with associated lifelong surveillance and risk-reduction [24]. It is important to isolate the specific utility of RRH from that of RRH-BSO or that of a multi-cancer risk syndrome in order to understand the impact that such a procedure would have on a potentially wider population of women than currently offered this. With the advent of validated personalised risk-prediction tools, a larger population of women at increased EC risk is expected to be identified in future, on the basis of risk factors such as obesity, diabetes, age, polygenic-risk-score, family history, etc [4]. Premenopausal RRH may become a consideration, and therefore must be evaluated as a strategy alongside other screening or risk-reduction strategies, including postmenopausal RRH, or intrauterine progestogen. It is therefore important to develop indication-independent utilities to counsel these women and to inform economic evaluations. To isolate the specific impact from RRH from that of RRH-BSO, an alternative methodology is required. Health-state utilities are most commonly derived by administering a preference-based instrument, such as EQ-5D, to patients within cohort studies or trials. Where a health state cannot easily be observed in practice, in this case because there is an insufficient cohort of women who have undergone premenopausal RRH without BSO, the recommended alternative is vignette-based valuation [25]. For this, a description of the health state is valued by members of the general public, using EQ-5D or other approaches.

The aim of this vignette study was to determine the HRUS for a premenopausal woman undergoing RRH for EC prevention, with and without BSO. This is essential for health-economic evaluations and may be used to inform clinical counselling.

2. Methods

Preventing Endometrial-Cancers: Comparing Risk-Reducing Strategies (PRESCORES) (ISRCTN17432105) part-2 is a UK-based randomised vignette study. The vignette-development process [26] aimed to describe the "typical" QoL of an otherwise healthy 40-year-old woman (previously identified at increased EC-risk) following RRH and RRH-BSO at short and long-term postoperative timepoints. These were then valued by members of the general population using EQ-5D [25]. The four vignettes were:

1. 1-month after RRH
2. 1-year after RRH
3. 1-month after RRH-BSO
4. 1-year after RRH-BSO

2.1. Vignette development

Evidence to inform development of the vignettes (health state descriptions) was provided from a number of sources. We first conducted a systematic review of quality-of-life following risk-reducing hysterectomy [7]. Subsequently, vignettes were iteratively developed following telephone interviews with five clinical experts who provide care to patients who undergo RRH, and four patients who had undergone RRH-BSO. Clinician interviews covered their professional experience, recovery from RRH (or hysterectomy for other indications) including symptoms, impact on quality-of-life and time taken for recovery, followed by a review of vignettes and suggested improvements. Patient interviews covered personal background including LS and any cancer diagnosis, details of RRH, recovery from RRH including symptoms and impact on quality-of-life (including questions on sexual and bladder function), time for recovery, and a review of vignettes and suggestions for improvement. All interviews were audio recorded and analysed to inform vignette development. Vignettes were revised and updated alongside interviews, and interviewees were able to see evolving drafts of the vignettes. All interview participants approved the final draft of vignettes. For all four vignettes the woman's age was standardised at 40 years at the time of valuation, irrespective of postoperative interval, so that the health states would be directly comparable and could be adjusted against a single general-population reference value for 40-year-old women. For vignettes describing RRH-BSO, patients were assumed to be taking HRT in accordance with national recommendations [6,11] (assuming no contraindications). See Table 1 for details of clinicians and participants interviewed.

Table 1
Clinicians and patients interviewed.

Interviewee	Experience
Consultant Gynaecological Oncologist	Over 10 years' experience as a gynaecological oncologist, current lead for a gynaecological cancer risk-reduction clinic.
Consultant Gynaecological Oncologist	Over 10 years' experience as a gynaecological oncologist, current lead for a gynaecological cancer risk-reduction clinic.
Consultant Gynaecologist with subspeciality interest in reproductive health	Over 20 years' experience as a gynaecologist, current lead for a menopause service within a gynaecological cancer risk-reduction clinic.
Clinical nurse specialist in gynaecological cancer risk-reduction	Over 10 years' experience as the lead clinical nurse specialist in a gynaecological cancer risk-reduction clinic, previously 20 years' experience in oncology nursing.
Clinical nurse specialist in gynaecological cancer risk-reduction	Over 5 years' experience in general gynaecology nursing, and over 2 years' experience in a gynaecological cancer risk-reduction clinic.
Patient - 42F	Lynch syndrome carrier RRH-BSO 1 year ago Unaffected
Patient - 62F	Lynch syndrome carrier RRH-BSO 4 years ago Previous colorectal cancer
Patient - 49F	Lynch syndrome carrier RRH-BSO 4 years ago Previous breast cancer
Patient - 47F	Lynch syndrome carrier RRH-BSO 3 years ago Unaffected

Clinicians are described by role, patients are described by their age in years and gender. RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy.

2.2. Recruitment

Vignettes were valued by a representative sample of the general population (rather than patients), as recommended by NICE [25]. Eligibility criteria included adult UK-women who were aged between 35 and 75 years, reflecting the ages at which RRH is offered in clinical practice [6]. Participants with a history of EC were excluded. Participants were recruited using a commercial survey company (Dynata, USA), stratified by age to be representative of the age-distribution of UK general population women within the target age range.

2.3. Outcomes

The primary outcome was the mean HRUS for each of the four vignette scenarios. Secondary outcomes included the identification of factors associated with HRUS.

2.4. Questionnaire and randomisation

The questionnaire included relevant questions on demographics and medical history, self-EQ-5D-5L and visual analogue scale (VAS) [27], and the vignette valuation exercise. Simple randomisation using the Python randomisation function was used to randomise participants into viewing one-of-four vignettes. Participants were asked to imagine they were the person described in the vignettes, and value the health and quality-of-life of the vignette using EQ-5D-5L. The questionnaire is provided in the appendix.

2.5. Statistical analysis

The desirable sample-size was planned to be 1000 women (250 responses per-vignette). This was judged to provide sufficient precision to evaluate potential difference in mean EQ-5D between vignette groups. For example, one standard-error on the difference would be approximately 8.9% (sqrt(2/250)) of the standard-deviation of EQ-5D in the sample. HRUS were valued using the NIHR Policy-Research-Unit in Economic Methods of Evaluation of Health-and-Care Interventions "EEPRU" dataset [28]. For vignette HRUS and VAS, adjustment for outliers was made by excluding values which were 1.5× the interquartile range above the upper-quartile or below the lower-quartile [29], with values provided as means ±standard deviation. The Kruskal-Wallis test was used to compare adjusted HRUS between the four scenarios, with post-hoc pairwise comparisons using the Mann-Whitney *U* test with Bonferroni correction.

Exploratory analysis was performed with ordinary least-squares regression (OLS) using non-parametric bootstrapping to compare variables which may be associated with vignette-HRUS at each time-point [30]. For regression analysis, factors were dichotomised for menopausal status (postmenopausal vs premenopausal), household income (>£40,000 vs <£40,000), and education level (higher vs further/secondary). The adjusted mean HRUS difference between RRH and RRH-BSO at each time-point were determined using OLS, with confidence-intervals (CIs) from a non-parametric bootstrap [31]. To determine the utility-value for each health state, suitable for use in health-economic evaluations [32], mean vignette valuations were then divided by the mean general population reference values for 40 year old women [33]. Analyses were undertaken using SPSS (IBM-Corporation, USA) and Stata-v18 (StataCorp, USA).

2.6. Ethical approval

This study was approved by the Surrey Research-Ethics-Committee (05/12/2022: 22/PR/1167, amended 14/06/24(SA2)).

2.7. Patient and public involvement (PPI)

The questionnaire, along with patient-facing materials such as the participant information sheet were reviewed by patient representatives including from the charity Lynch-Syndrome UK (LSUK), and lay members of the general public (without specific health conditions) who formed part of the Wolfson-Institute of Population-Health (WIPH) public and patient involvement (PPI) group.

3. Results

3.1. Participants

Due to the survey methods used it is not possible to know how many potential participants were invited to participate. A total of 1001 women were randomised from 1528 respondents (Fig. 1).

The mean-age (±SD) of participants was 53.6 ± 11.4 years. Baseline characteristics of all participants, including self-EQ-5D and VAS, are in Table 2.

3.2. Vignette health-related utility-scores

There were 70 HRUS that were judged to be outliers and subsequently excluded from the analysis. The mean (±SD) HRUS-score was highest for "RRH 1-year" at 0.942 (±0.072), followed by "RRH-BSO 1-year" at 0.841 (±0.137), while "RRH 1-month" was 0.670 (±0.149) and "RRH-BSO 1-month" was 0.733 (±0.190) (see Table 3 and Fig. 2). There was significant difference between the 4 groups ($p < 0.001$) and pairwise comparisons indicated significant differences across all pairs of groups ($p < 0.001$). VAS based scores ranged from 60.16 for "RRH 1-month" to 86.63 for "RRH 1-year" (Table 3).

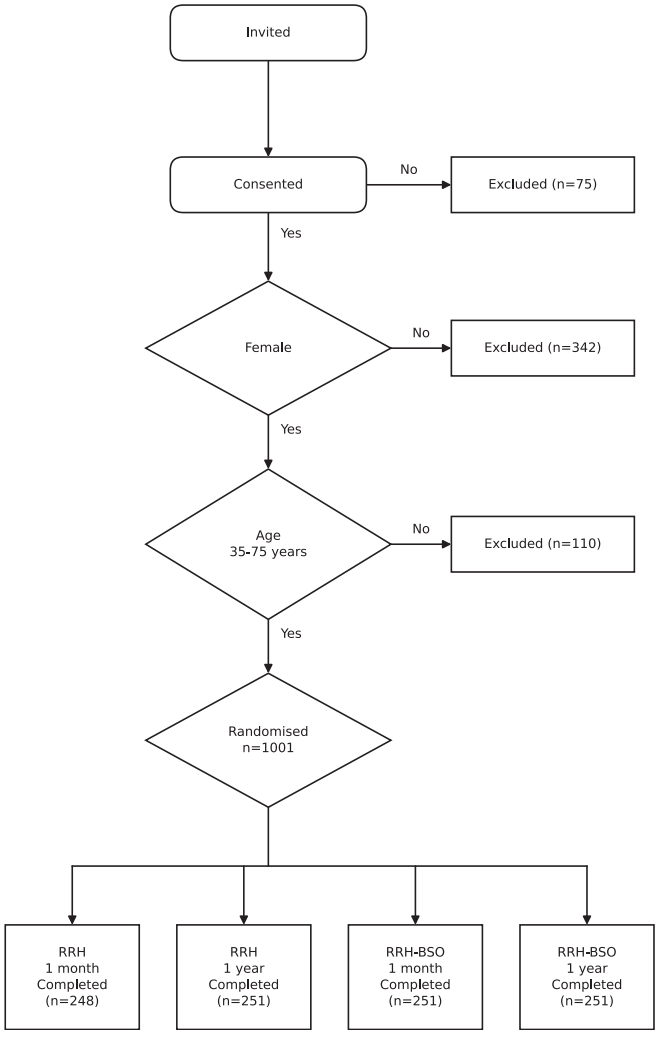

Fig. 1. PRISMA flowchart.
Legend: RRH – risk-reducing hysterectomy; RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy.

3.3. Regression analysis

Age (0.0014, 95%CI:0.0004,0.0024, $p = 0.007$) and post-menopausal status (0.0283, 95%CI:0.0036,0.0529, $p = 0.024$) of participants were associated with higher vignette HRUS overall, whereas mixed ethnicity was associated with lower vignette HRUS (−0.0913, 95%CI:−0.1770, −0.0055, $p = 0.037$).

At 1-month, post-RRH mean vignette-HRUS was 0.0635 (95%CI: 0.0940,0.0330) lower for RRH versus RRH-BSO. For this time-point, increasing age was associated with higher HRUS for RRH vs RRH-BSO (0.0016, 95%CI:0.0002,0.0030, $p = 0.024$), whereas obesity was associated with lower HRUS for RRH versus RRH-BSO (−0.0459, 95%CI: −0.0819,−0.0098, $p = 0.013$). Postmenopausal status was not significantly associated with a difference in HRUS between RRH versus RRH-BSO at 1-month ($p = 0.107$). After adjusting for age and obesity, the mean difference in HRUS between RRH and RRH-BSO at 1-month was −0.0628 (95%CI:−0.0928,−0.0328, $p < 0.001$).

At 1-year, mean vignette HRUS was 0.1009 (95%CI:0.0810,0.1209) higher for RRH versus RRH-BSO. At this timepoint, higher income was associated with an increasing HRUS for RRH vs RRH-BSO (0.0193, 95% CI:0.0003,0.0383, $p = 0.046$), whereas heavy menstrual bleeding was associated with a mean decrease in HRUS for RRH vs RRH-BSO (−0.0351, 95%CI:−0.0680,−0.0022, $p = 0.037$), and postmenopausal status was not associated with any difference in HRUS for RRH vs RRH-BSO($p = 0.077$). Therefore, after adjusting for income and heavy menstrual bleeding, the mean difference in HRUS between RRH and RRH-BSO at 1-year was 0.0991 (95%CI:0.0799,0.1182, $p < 0.001$).

3.4. Adjustment against general population reference

After adjusting for the age and sex- matched general-population, HRUS for "RRH 1-year" were 1.000 (95%CI:1.00,1.00), "RRH-BSO 1-year" were 0.994 (95%CI:0.97,1.00), "RRH 1-month" were 0.791 (95% CI:0.77,0.81) and "RRH-BSO 1-month" were 0.866 (95%CI:0.84,0.90) (see Table 4).

4. Discussion

4.1. Main findings

This study provides HRUS following premenopausal RRH with and without BSO; finding a mean HRUS for RRH of 0.6695 at 1-month and 0.9416 at 1-year, and for RRH-BSO of 0.7330 at 1-month and 0.8407 at 1-year. These valuations are significantly different across all comparisons. When comparing against age-and sex-matched general population reference values, this translates to an adjusted HRUS of 0.791 for RRH at 1-month, 1.000 for RRH at 1-year, 0.866 for RRH-BSO at 1-month, and 0.994 for RRH-BSO at 1-year. Increasing age of participants and postmenopausal status were associated with higher valuations overall, and higher income was associated with higher valuations for RRH vs RRH-BSO at 1-year. Obesity and heavy menstrual-bleeding were associated with lower valuations for RRH compared to RRH-BSO at 1-month and 1-year respectively.

4.2. Strengths and limitations

This is the first study to report HRUS following 'RRH' for EC prevention, 'with and without' BSO, and provides values which can be used for

Table 2
Baseline characteristics of all included participants (n (%) unless otherwise specified).

	RRH 1 month	RRH 1 year	RRH-BSO 1 month	RRH-BSO 1 year	Overall
N	248	251	251	251	1001
Age, mean [SD]	53.3 [11.1]	54.3 [11.6]	53.9 [11.2]	53.5 [11.5]	53.6 [11.4]
Nature of periods:					
Regular	65 (26.2%)	62 (24.7%)	58 (23.1%)	65 (25.9%)	250 (25.0%)
Irregular ≥1 in last year	45 (18.1%)	34 (13.5%)	38 (15.1%)	44 (17.5%)	161 (16.1%)
No periods for 1 year	138 (55.6%)	155 (61.8%)	155 (61.8%)	142 (56.6%)	590 (58.9%)
Personal medical history[1]:					
Obesity (BMI ≥30)	53 (21.4%)	64 (25.5%)	53 (21.1%)	58 (23.1%)	228 (22.8%)
Diabetes	18 (7.3%)	16 (6.4%)	15 (6.0%)	17 (6.8%)	66 (6.6%)
PCOS	10 (4.0%)	8 (3.2%)	8 (3.2%)	16 (6.4%)	42 (4.2%)
Heavy menstrual bleeding	43 (17.3%)	30 (12.0%)	30 (12.0%)	36 (14.3%)	139 (13.9%)
Endometriosis	7 (2.8%)	11 (4.4%)	12 (4.8%)	13 (5.2%)	43 (4.3%)
Hypertension	52 (21.0%)	52 (20.7%)	62 (24.7%)	41 (16.3%)	207 (20.7%)
Personal cancer history					
No	229 (92.3%)	227 (90.4%)	233 (92.8%)	227 (90.4%)	916 (91.5%)
Yes	18 (7.3%)	23 (9.2%)	15 (6.0%)	24 (9.6%)	80 (8.0%)
Cancer type[1]*:*					
Breast	6 (2.4%)	14 (5.6%)	7 (2.8%)	8 (3.2%)	35 (3.5%)
Bowel	3 (1.2%)	0 (0%)	1 (0.4%)	2 (0.8%)	6 (0.6%)
Melanoma	2 (0.8%)	3 (1.2%0	0 (0%)	2 (0.8%)	7 (0.7%)
Ovarian	0 (0%)	2 (0.8%)	2 (0.8%)	3 (1.2%)	7 (0.7%)
Lymphoma	1 (0.4%)	1 (0.4%)	1 (0.4%)	0 (0%)	3 (0.1%)
Kidney	1 (0.4%)	0 (0%)	0 (0%)	1 (0.4%)	2 (0.2%)
Brain	0 (0%)	0 (0%)	0 (0%)	1 (0.4%)	1 (0.1%)
Other	5 (2.0%)	3 (1.2%)	4 (1.6%)	6 (2.4%)	18 (1.8%)
Family history of womb/ ovarian/ cervical cancer	24 (9.7%)	31 (12.4%)	27 (10.8%)	19 (7.6%)	103 (10.3%)
Have children	174 (70.2%)	184 (73.3%)	168 (66.9%)	181 (72.1%)	707 (70.6%)
Plan for more children					
No	226 (91.1)	226 (90.0%)	226 (90.0%)	227 (90.4%)	905 (90.4%)
Yes	12 (4.8%)	18 (7.2%)	10 (4.0%)	11 (4.4%)	51 (5.1%)
Unsure	10 (4.0%)	7 (2.8%)	15 (6.0%)	13 (5.2%)	45 (4.5%)
Ethnicity					
White	208 (83.9%)	213 (84.9%)	226 (90.0%)	214 (85.3%)	861 (86.0%)
Black	8 (3.2%)	11 (4.4%)	5 (2.0%)	11 (4.4%)	35 (3.5%)
Asian	16 (6.5%)	12 (4.8%)	10 (4.0%)	10 (4.0%)	48 (4.8%)
Mixed	9 (3.6%)	4 (1.6%)	2 (0.8%)	5 (2.0%)	20 (2.0%)
Other	7 (2.8%)	11 (4.4%)	8 (3.2%)	11 (4.4%)	37 (3.7%)
Relationship status					
Single	52 (21.0%)	45 (17.9%)	43 (17.1%)	46 (18.3%)	186 (18.6%)
In a relationship	33 (13.3%)	22 (8.8%)	24 (9.6%)	21 (8.4%)	100 (10.0%)
Married/ co-habiting	121 (48.8%	148 (59.0%)	144 (57.4%)	146 (58.2%)	559 (55.8%)
Separated/ divorced/ widowed	41 (16.5%)	35 (13.9%)	40 (15.9%)	37 (14.7%)	153 (15.3%)
Educational level					
No formal qualifications	9 (3.6%)	13 (5.2%)	5 (2.0%)	15 (6.0%)	42 (4.2%)
GCSE or equivalent	55 (22.2%)	52 (20.7%)	72 (28.7%)	51 (20.3%)	230 (23.0%)
A-Level or equivalent	56 (22.6%)	58 (23.1%)	62 (24.7%)	61 (24.3%)	237 (23.7%)
Undergraduate degree or equivalent	70 (28.2%)	72 (28.7%)	62 (24.7%)	69 (27.5%)	273 (27.3%)
Postgraduate degree or equivalent	38 (15.3%)	36 (14.3%)	29 (11.6%)	39 (15.5%)	142 (14.2%)
Other	20 (8.1%)	20 (8.0%)	21 (8.4%)	16 (6.4%)	77 (7.7%)
Household income					
< £10,000	15 (6.0%)	20 (8.0%)	17 (6.8%)	20 (8.0%)	72 (7.2%)
£10,000–£19,999	47 (19.0%)	39 (15.5%)	42 (16.7%)	53 (21.1%)	181 (18.1%)
£20,000–£29,999	55 (22.2%)	52 (20.7%)	53 (21.1%)	45 (17.9%)	205 (20.5%)
£30,000–£39,999	48 (19.4%)	39 (15.5%)	34 (13.5%)	44 (17.5%)	165 (16.5%)
£40,000–£49,999	31 (12.5%)	29 (11.6%)	31 (12.4%)	33 (13.1%)	124 (12.4%)
≥£50,000	48 (19.4)	65 (25.9%)	67 (26.7%)	55 (21.9%)	235 (23.5%)
Self EQ-5D HRUS*					
Mean	0.73704	0.72475	0.72373	0.73278	0.72955
Median	0.79100	0.79000	0.79100	0.79100	0.79100
SD	0.23897	0.24261	0.25431	0.24363	0.24466
Min	−0.22100	−0.24000	−0.35800	−0.21100	−0.35800
Max	0.98800	0.98800	0.98800	0.98800	0.98800
25th percentile	0.65550	0.66800	0.66300	0.68000	0.66750
75th percentile	0.88900	0.86800	0.88900	0.88900	0.88900
Self VAS*					
Mean	67.40	68.09	68.44	68.78	68.18
Median	70.00	71.00	71.00	72.00	71.00
SD	20.62	21.16	20.88	21.05	20.90
Min	3.00	12.00	9.00	10.00	3.00
Max	100	100	100	100	100
25th percentile	50.50	50.00	59.00	59.00	58.00
75th percentile	82.00	82.00	82.00	85.00	82.00

* Self EQ.5D and VAS scores based on participant QoL/health at time of questionnaire completion; RRH – risk-reducing hysterectomy; RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy; SD – standard deviation; VAS - visual analogue scale, HRUS - health-related utility scores, BMI - body mass index, PCOS - polycystic ovarian syndrome.

Table 3
Vignette EQ-5D health-related utility scores and visual-analogue scale.

	RRH 1 month	RRH 1 year	RRH-BSO 1 month	RRH-BSO 1 year
EQ-5D HRUS				
N	231	219	240	241
Mean	0.66953	0.94164	0.73299	0.84071
Median	0.66900	0.98500	0.75200	0.86800
SD	0.14879	0.07239	0.18977	0.13661
Minimum	0.26800	0.69400	0.18100	0.42200
Maximum	0.98500	0.98500	0.98500	0.98500
25th percentile	0.58200	0.89000	0.61900	0.77750
75th percentile	0.76900	0.98500	0.89000	0.98500
VAS				
N	243	226	250	248
Mean	60.16	86.63	64.76	74.04
Median	61.00	90.00	68.00	80.00
SD	17.80	10.80	20.07	17.84
Minimum	19.00	58.00	10.00	20.00
Maximum	100	100	100	100
25th percentile	50.00	80.00	50.00	61.50
75th percentile	71.00	95.00	80.00	89.00

RRH – risk-reducing hysterectomy; RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy; SD – standard deviation; HRUS – health-related utility scores; VAS – visual analogue scale.

Table 4
Adjusted vignette HRUS against general population reference values for England.

Source	Mean	Lower 95% CI	Upper 95% CI
General population reference HRUS, 40-44 yrs., female [24]	0.8460	0.8420	0.8610
Adjusted HRUS by scenario			
RRH, 1 month	0.7914	0.4173	1.0000*
RRH, 1 year	1.0000	0.8777	1.0000*
RRH-BSO, 1 month	0.8664	0.3480	1.0000*
RRH-BSO, 1 year	0.9937	0.5444	1.0000*

* Upper limit bounded to 1.00; HRUS - Health related utility scores; RRH – risk-reducing hysterectomy; RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy; CI - confidence interval.

counselling and health-economic evaluations of women at increased EC-risk. It closely follows methodological recommendations from NICE with respect to vignette development and valuation [25,26]. Vignettes were developed following a rigorous process using evidence from a systematic review [7], clinical and patient experts, and were iteratively developed and piloted prior to use. We used a validated and widely-used tool (EQ-5D) to value HRUS, with the currently recommended UK valuation algorithm [25]. A large sample of women were recruited, representative of the UK population across the age range at which RRH is offered in clinical practice to high-EC-risk women, and randomisation minimised biases in scenario allocation. The vignettes were designed to value the health states of premenopausal RRH and RRH-BSO irrespective of the source of EC risk. Whilst oophorectomy at around age 40 is principally indicated for MLH1 and MSH2 carriers, the resulting utilities are applicable wherever premenopausal RRH with or without oophorectomy may be considered, and are required for economic evaluation and may help inform counselling irrespective of the underlying indication.

Limitations are those typical of a vignette study rather than a prospective study in affected patients evaluating change from baseline over time. This was not possible as premenopausal RRH without BSO is not yet routinely undertaken at the scale required to provide a sufficiently large cohort to assess this. Despite rigorous development there may be subtle differences between the vignette description of the "typical" patient experience and reality, and each vignette cannot be comprehensive, or it would be too long and infeasible. Vignette content reflects contemporary UK clinical practice, for example, the availability of endometrial surveillance, although the reference to screening was not intended to be an endorsement of this as a risk-reducing strategy. The patients who contributed to vignette development had predominantly undergone RRH-BSO for Lynch Syndrome; whilst the postoperative health state is largely determined by the surgery itself rather than the underlying indication, their experience may have shaped some attributes emphasised in the vignettes. Although the vignettes depict a "typical" postoperative experience on standard HRT, they cannot capture every variation in management pathway or recent advances in menopause treatment such as non-hormonal agents for vasomotor symptoms. Participants may not be reliable in their valuation of

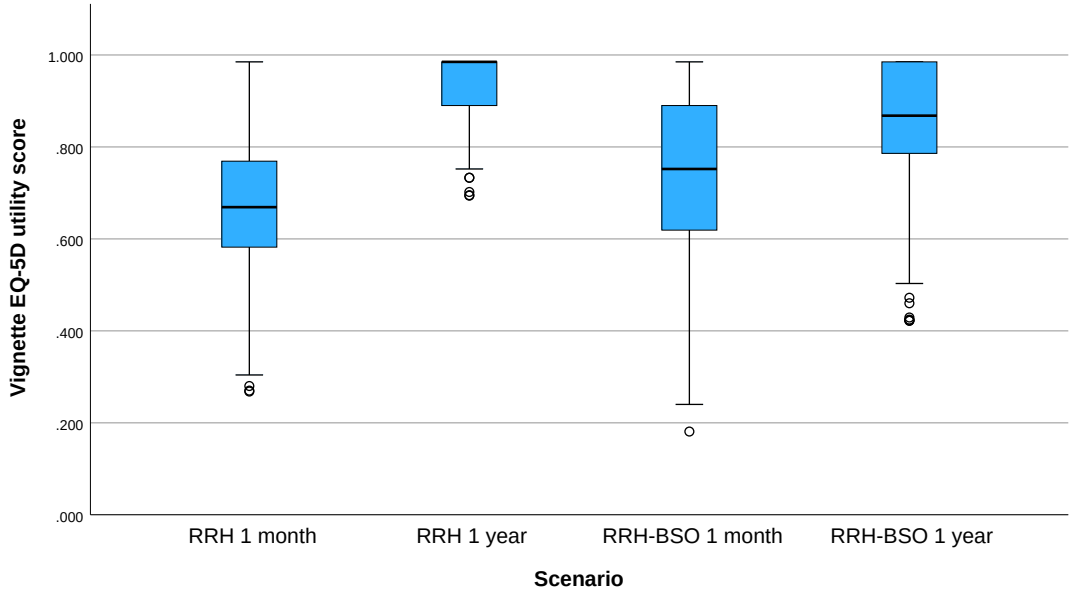

Fig. 2. Boxplot of vignette EQ-5D HRUS by scenario.
Legend: HRUS - Health related utility scores; RRH – risk-reducing hysterectomy; RRH-BSO – risk-reducing hysterectomy and bilateral salpingo-oophorectomy.

vignettes due to their inability to fully imagine themselves as the described patient, or to remember and incorporate all aspects of the vignette into their judgement. We deliberately did not explicitly specify the anxiety/depression dimension within the vignettes, to avoid priming or labelling effects. Therefore, valuations on this dimension reflect participants' interpretation of the described state rather than an explicit descriptor, which may have introduced additional variation. There may be lack of engagement from some participants; this was suspected with those recording very low scores and is somewhat mitigated by the removal of outliers. Inclusion of such low-scoring outliers would have reduced the mean EQ-5D scores by between 0.03 and 0.07 depending on scenario. However, including the outliers in a sensitivity analysis showed that RRH 1-month still led to the lowest EQ-5D valuation, and RRH 1-year the highest. There are recognised biases with vignette valuations such as in naming a condition ("cancer" or "menopause"), which may result in lower ratings than a patient with such a condition would self-rate. These issues are further discussed below.

4.3. Interpretation

Although many findings are as expected, there is an inconsistency in the higher valuation for RRH-BSO compared to RRH at 1-month given the burden of surgical menopause following BSO (albeit mitigated by HRT). Nevertheless, as expected, valuation improved with time, with RRH-BSO at 1-year being higher than at 1-month. Additionally, RRH at 1-year was valued higher than RRH-BSO at 1-year. A possible explanation is the impact of descriptive length of the vignette; RRH-BSO at 1-month was the longest scenario and thus participants may have paid less attention to every detail. Participants may have been more inclined to skip, ignore or forget content during the valuation, as has been previously recognised [26]. This is further supported by the finding that "RRH-BSO at 1-month" had the highest dispersion and hence variation in interpretation amongst participants.

Care was taken to minimise the "labelling" effect, whereby naming a disease state reduces valuations in those without disease, due to their preconceptions and biases [34]. Despite the lack of the word "menopause", there was variation in how participants valued surgical menopause states. Participant age and postmenopausal status were associated with higher valuations overall, although not always when comparing RRH versus RRH-BSO. Heavy menstrual bleeding and obesity were associated with a smaller difference in HRUS between RRH/RRH-BSO, perhaps suggesting that some participants may have assumed that cyclical pain associated with their heavy menstrual bleeding may have continued (as this was not specified in the vignette), or that they viewed the menopause more favourably than others. Higher income was associated with a greater difference between RRH and RRH-BSO at 1-year. This may possibly reflect a greater awareness amongst those with higher income of the impact of surgical menopause on QoL [35], although other studies have reported a positive association between income and attitudes towards the menopause and reduced symptom severity [36]. While mixed/other ethnicity were associated with lower valuations overall, and other studies have reported ethnic differences in attitudes towards the menopause [37,38], the small number of participants and non-specific/diverse nature of these categories suggests need for caution in interpretation.

The results of this study can be compared to other studies reporting HRUS of RRSO for OC prevention, menopause, and hysterectomy for gynaecological disease. A previous vignette study found a mean HRUS of risk-reducing BSO for OC prevention of 0.95 amongst *BRCA* PV-carriers, although with no adjustment against general population reference [39]; this study is widely used as the basis for health-economic evaluations of OC prevention [40]. This valuation is different to the present study which valued RRH-BSO at 1 year as 0.841 (or 0.994 after adjusting against the reference population), likely in-part as vignettes in the current study described HRT to satisfactorily control symptoms, whilst also providing greater detail on vignette development, content (including patient age/postoperative time-point, symptoms), using EQ-5D rather than direct valuation, and adjustment against the general population reference. This valuation of HRUS of RRH-BSO at 1-year (0.841) is similar to a vignette-study which reported HRUS from mild menopausal symptoms as 0.85 [41], and a large cohort study which reported reduced QoL in postmenopausal women, although neither specifically explored the impact of hysterectomy [42]. The HRUS of the "RRH-BSO at 1-year" group is similar to a cohort study reporting 0.86 after 6-months' follow-up of hysterectomy-BSO for early-stage EC [43], and after 1-year follow-up in a randomised-controlled trial of laparoscopic hysterectomy for benign indications (0.897–0.920) [44,45]. Another randomised-controlled trial of hysterectomy (without BSO) for menorrhagia found a low baseline HRUS of 0.78, which improved to 0.88 after 5-years' follow-up [46]. Thus, RRH in the current study is associated with a higher valuation than treatment hysterectomy, which would be expected given that patients in the scenarios had no ongoing gynaecological disease (which would lower their baseline QoL).

Both RRH-BSO vignettes described good compliance with HRT, which was reasonable given national recommendations that the operating gynaecologist would advise on postoperative HRT, with appropriate follow-up in primary or secondary care [6,11]. Where services do not provide this, or patients have contraindications, the QoL impact of surgical menopause would be expected to be much greater [9], and this should be factored into clinical decision-making/economic modelling.

Overall, there is reason to have high confidence in the 1-year valuations of RRH ± BSO in the current study; results are consistent with and slightly higher than other studies of treatment hysterectomy for gynaecological disease. Although RRH-BSO received a significantly lower valuation than RRH at 1-year, this is comparable to valuations of risk-reducing BSO, or hysterectomy-BSO for gynaecological disease/EC, and translates to a minimal difference in QoL (0.994) after adjusting for general population reference values. There is greater variation amongst the 1-month valuations, perhaps reflecting the greater variation in recovery at this time point, and reflecting the well-recognised phenomenon of lower valuations of health states by controls.

Although utilities were elicited from a UK general-population sample, scored using the UK EQ-5D value set and then adjusted against that same value set, the adjusted utilities are potentially generalisable to other settings, provided there is comparable post-operative menopause treatment. This adjusted utility decrement is less sensitive to differences in national value sets or baseline population health than the unadjusted values [32]. These are therefore suitable for use in economic models in other settings, including the US, provided there are setting-specific epidemiological and cost inputs. However, the observed differences in valuations by participant characteristics, in particular ethnicity, should be interpreted with caution as these likely reflect a UK-specific context and are not directly generalisable to other healthcare systems/ethnic populations.

Whilst this study isolates the utilities of RRH and RRH-BSO, ultimately decision making would also consider other alternative strategies and a complete economic evaluation of EC risk-reduction strategies would also require utilities for alternative strategies, such as the levonorgestrel-releasing intrauterine system and endometrial surveillance. Obtaining utilities for such approaches should be a priority for future research.

5. Conclusion

This vignette-based randomised study finds that for a 40-year-old woman in the UK, the HRUS following RRH is 0.670 after 1-month and 0.942 after 1-year, and for RRH-BSO is 0.733 after 1-month and 0.841 after 1-year. Adjusted for general population reference values, this equates to 0.791 for RRH at 1-month, 1.000 for RRH at 1-year, 0.866 for RRH-BSO at 1-month, and 0.994 for RRH-BSO at 1-year. This study helps isolate the specific impact of RRH from RRH-BSO, can help inform

clinical guidelines and is highly relevant for health-economic evaluations and modelling risk thresholds for offering EC prevention.

CRediT authorship contribution statement

Samuel Oxley: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Amanda Dibden:** Writing – review & editing, Validation, Formal analysis, Data curation. **Tia Whenham:** Project administration. **Xia Wei:** Writing – review & editing. **Lea Mansour:** Writing – review & editing. **Ashwin Kalra:** Writing – review & editing. **Subhasheenee Ganesan:** Writing – review & editing. **Jacqueline Sia:** Writing – review & editing, Project administration. **Michail Sideris:** Writing – review & editing. **Caitlin Fierheller:** Writing – review & editing. **Margarida Kurzer:** Writing – review & editing. **Rachel Perfect-Lake:** Writing – review & editing, Methodology. **Jyotsna Pundir:** Writing – review & editing, Methodology. **D. Gareth Evans:** Writing – review & editing. **Lesa Dawson:** Writing – review & editing, Methodology. **Kevin Monahan:** Writing – review & editing. **Tracy Smith:** Writing – review & editing, Methodology. **Adam Brentnall:** Writing – review & editing, Validation, Supervision, Formal analysis, Data curation. **Rosa Legood:** Writing – review & editing, Supervision, Formal analysis, Conceptualization. **Ranjit Manchanda:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Formal analysis, Conceptualization.

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Declaration of competing interest

RM declares receiving grants from Yorkshire Cancer Research, GSK, NHS England, Barts Charity, Cancer Research UK and the NHS Innovation Accelerator; receiving speaking fees from GSK, MSD; and receiving personal fees for serving on the advisory boards for EGL and AstraZeneca outside the submitted work.

Appendix A. Supplementary data

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References

[1] International Agency for Research on Cancer. Cancer Tomorrow, A Tool That Predicts the Future Cancer Incidence and Mortality Burden Worldwide From the Current Estimates in 2018 up Until 2040, International Agency for Research on Cancer (IARC), Lyon, France, 2020.
[2] E.J. Crosbie, M. Zwahlen, H.C. Kitchener, M. Egger, A.G. Renehan, Body mass index, hormone replacement therapy, and endometrial cancer risk: a meta-analysis, Cancer Epidemiol. Biomarkers Prev. 19 (12) (2010) 3119–3130.
[3] M. Dominguez-Valentin, J.R. Sampson, T.T. Seppälä, S.W. Ten Broeke, J.-P. Plazzer, S. Nakken, et al., Cancer risks by gene, age, and gender in 6350 carriers of pathogenic mismatch repair variants: findings from the prospective Lynch syndrome database, Genet. Med. 22 (1) (2020) 15–25.
[4] S.J. Kitson, E.J. Crosbie, D.G. Evans, A. Lophatananon, K.R. Muir, D. Ashcroft, et al., Predicting risk of endometrial cancer in asymptomatic women (PRECISION): model development and external validation, BJOG 131 (7) (2024) 996–1005.
[5] K.M. Schmeler, H.T. Lynch, L.-m. Chen, M.F. Munsell, P.T. Soliman, M.B. Clark, et al., Prophylactic surgery to reduce the risk of gynecologic cancers in the Lynch syndrome, N. Engl. J. Med. 354 (3) (2006) 261–269.
[6] E.J. Crosbie, N.A.J. Ryan, M.J. Arends, T. Bosse, J. Burn, J.M. Cornes, et al., The Manchester international consensus group recommendations for the management of gynecological cancers in Lynch syndrome, Genet. Med. 21 (10) (2019) 2390–2400.
[7] S. Oxley, R. Xiong, X. Wei, A. Kalra, M. Sideris, R. Legood, et al., Quality of life after risk-reducing hysterectomy for endometrial cancer prevention: a systematic review, Cancers 14 (23) (2022), 5832.
[8] C.M. Farquhar, L. Sadler, S.A. Harvey, A.W. Stewart, The association of hysterectomy and menopause: a prospective cohort study, BJOG 112 (7) (2005) 956–962.
[9] H. Etchegary, E. Dicks, L. Tamutis, L. Dawson, Quality of life following prophylactic gynecological surgery: experiences of female Lynch mutation carriers, Fam. Cancer 17 (1) (2018) 53–61.
[10] X. Wei, S. Oxley, M. Sideris, A. Kalra, A. Brentnall, L. Sun, et al., Quality of life after risk-reducing surgery for breast and ovarian cancer prevention: a systematic review and meta-analysis, Am. J. Obstet. Gynecol. 229 (4) (2023 Oct) 388–409 e4.
[11] R. Manchanda, F. Gaba, V. Talaulikar, J. Pundir, S. Gessler, M. Davies, et al., Risk-Reducing Salpingo-Oophorectomy and the Use of Hormone Replacement Therapy Below the Age of Natural Menopause: Scientific Impact Paper No. 66, BJOG, 2021.
[12] R.S. Mandelbaum, C.L. Adams, K. Yoshihara, D.J. Nusbaum, S. Matsuzaki, K. Matsushima, et al., The rapid adoption of opportunistic salpingectomy at the time of hysterectomy for benign gynecologic disease in the United States, Am. J. Obstet. Gynecol. 223 (5) (2020) 721.e1-.e18.
[13] G. Elwyn, A. O'Connor, D. Stacey, R. Volk, A. Edwards, A. Coulter, et al., Developing a quality criteria framework for patient decision aids: online international Delphi consensus process, BMJ 333 (7565) (2006), 417.
[14] National Institute for Health and Care Excellence, Developing NICE Guidelines: The Manual, National Institute for Health and Care Excellence, London, UK, 2024. Available from: https://www.nice.org.uk/process/pmg20/chapter/incorporating-economic-evaluation.
[15] R. Manchanda, R. Legood, A.C. Antoniou, V.S. Gordeev, U. Menon, Specifying the ovarian cancer risk threshold of 'premenopausal risk-reducing salpingo-oophorectomy' for ovarian cancer prevention: a cost-effectiveness analysis, J. Med. Genet. 53 (9) (2016) 591–599.
[16] R. Manchanda, R. Legood, L. Pearce, U. Menon, Defining the risk threshold for risk reducing salpingo-oophorectomy for ovarian cancer prevention in low risk postmenopausal women, Gynecol. Oncol. 139 (3) (2015) 487–494.
[17] R. Manchanda, R. Legood, A.C. Antoniou, L. Pearce, U. Menon, Commentary on changing the risk threshold for surgical prevention of ovarian cancer, BJOG 125 (5) (2018) 541–544.
[18] R. Manchanda, F. Gaba, V. Talaulikar, J. Pundir, S. Gessler, M. Davies, et al., Risk-reducing salpingo-oophorectomy and the use of hormone replacement therapy below the age of natural menopause: scientific impact paper no. 66 October 2021: scientific impact paper no. 66, BJOG 129 (1) (2022) e16–e34.
[19] E. Slade, L. Berg, K. Dworzynski, R. Manchanda, Guideline C, Ovarian cancer: identifying and managing familial and genetic risk-summary of new NICE guidance, BMJ 385 (2024), q807.
[20] J.D. Wright, E.R. Silver, S.X. Tan, C. Hur, F. Kastrinos, Cost-effectiveness analysis of genotype-specific surveillance and preventive strategies for gynecologic cancers among women with Lynch syndrome, JAMA Netw. Open 4 (9) (2021), e2123616.
[21] T.M. Snowsill, H. Coelho, N.G. Morrish, S. Briscoe, K. Boddy, T. Smith, et al., Gynaecological cancer surveillance for women with Lynch syndrome: systematic review and cost-effectiveness evaluation, Health Technol. Assess. 28 (41) (2024), 1.
[22] T.T. Seppälä, M. Dominguez-Valentin, E.J. Crosbie, C. Engel, S. Aretz, F. Macrae, et al., Uptake of hysterectomy and bilateral salpingo-oophorectomy in carriers of pathogenic mismatch repair variants: a prospective Lynch syndrome database report, Eur. J. Cancer 148 (2021) 124–133.
[23] National Comprehensive Cancer Network, NCCN Clinical Practice Guidelines in Oncology: Genetic/Familial High-Risk Assessment: Colorectal, Endometrial, and Gastric, Version 1 2024.
[24] K.J. Monahan, N. Bradshaw, S. Dolwani, B. Desouza, M.G. Dunlop, J.E. East, et al., Guidelines for the management of hereditary colorectal cancer from the British Society of Gastroenterology (BSG)/Association of Coloproctology of Great Britain and Ireland (ACPGBI)/United Kingdom Cancer genetics group (UKCGG), Gut 69 (3) (2020) 411–444.
[25] National Institute of Health and Care Excellence, NICE Health Technology Evaluations: The Manual, National Institute for Health and Care Excellence, London, UK, 2022 [cited 2022 19 May]. Process and methods [PMG36].
[26] L.S. Matza, K.D. Stewart, A.J. Lloyd, D. Rowen, J.E. Brazier, Vignette-based utilities: usefulness, limitations, and methodological recommendations, Value Health 24 (6) (2021) 812–821.
[27] B. van Hout, M.F. Janssen, Y.S. Feng, T. Kohlmann, J. Busschbach, D. Golicki, et al., Interim scoring for the EQ-5D-5L: mapping the EQ-5D-5L to EQ-5D-3L value sets, Value Health 15 (5) (2012) 708–715.
[28] M. Hernández Alava, S. Pudney, A. Wailoo, Estimating the relationship between EQ-5D-5L and EQ-5D-3L: results from a UK population study, PharmacoEconomics 41 (2) (2023) 199–207.
[29] M.G. Larson, Descriptive statistics and graphical displays, Circulation 114 (1) (2006) 76–81.
[30] D.J. Zhou, R. Chahal, I.H. Gotlib, S. Liu, Comparison of lasso and stepwise regression in psychological data, Methodology 20 (2) (2024) 121–143.
[31] N. Devlin, D. Parkin, B. Janssen, Analysis of EQ-5D values, in: N. Devlin, D. Parkin, B. Janssen (Eds.), Methods for Analysing and Reporting EQ-5D Data, Springer International Publishing, Cham 2020, pp. 61–86.
[32] J. Brazier, R. Ara, I. Azzabi, J. Busschbach, H. Chevrou-Séverac, B. Crawford, et al., Identification, review, and use of health state utilities in cost-effectiveness models: an ISPOR good practices for outcomes research task force report, Value Health 22 (3) (2019) 267–275.
[33] S. McNamara, P.P. Schneider, J. Love-Koh, T. Doran, N. Gutacker, Quality-adjusted life expectancy norms for the English population, Value Health 26 (2) (2023) 163–169.
[34] D. Rowen, J. Brazier, A. Tsuchiya, T. Young, R. Ibbotson, It's all in the name, or is it? The impact of labeling on health state values, Med. Decis. Mak. 32 (1) (2012) 31–40.
[35] E. Noroozi, N.K. Dolatabadi, A.A. Eslami, A. Hassanzadeh, S. Davari, Knowledge and attitude toward menopause phenomenon among women aged 40–45 years, J. Educ. Health Promot. 2 (1) (2013) 25.

[36] M. Nosek, H.P. Kennedy, Y. Beyene, D. Taylor, C. Gilliss, K. Lee, The effects of perceived stress and attitudes toward menopause and aging on symptoms of menopause, J. Midwifery Womens Health 55 (4) (2010) 328–334.
[37] S. Dashti, N. Bahri, T.F. Najafi, M. Amiridelui, R.L. Roudsari, Influencing factors on women's attitudes toward menopause: a systematic review, Menopause 28 (10) (2021) 1192–1200.
[38] G. Richard-Davis, A. Singer, D.D. King, L. Mattle, Understanding attitudes, beliefs, and behaviors surrounding menopause transition: results from three surveys, Patient Relat. Outcome Meas. (2022) 273–286.
[39] V.R. Grann, P. Patel, A. Bharthuar, J.S. Jacobson, E. Warner, K. Anderson, et al., Breast cancer-related preferences among women with and without BRCA mutations, Breast Cancer Res. Treat. 119 (1) (2010) 177–184.
[40] X. Wei, S. Oxley, M. Sideris, A. Kalra, L. Sun, L. Yang, et al., Cost-effectiveness of risk-reducing surgery for breast and ovarian cancer prevention: a systematic review, Cancers 14 (24) (2022), 6117.
[41] E. Daly, A. Gray, D. Barlow, K. McPherson, M. Roche, M. Vessey, Measuring the impact of menopausal symptoms on quality of life, Br. Med. J. 307 (6908) (1993) 836–840.
[42] R. Hess, R.C. Thurston, R.D. Hays, C.-C.H. Chang, S.N. Dillon, R.B. Ness, et al., The impact of menopause on health-related quality of life: results from the STRIDE longitudinal study, Qual. Life Res. 21 (2012) 535–544.
[43] N. Graves, M. Janda, K. Merollini, V. Gebski, A. Obermair, The cost-effectiveness of total laparoscopic hysterectomy compared to total abdominal hysterectomy for the treatment of early stage endometrial cancer, BMJ Open 3 (4) (2013), e001884.
[44] R. Garry, J. Fountain, J. Brown, A. Manca, S. Mason, M. Sculpher, et al., EVALUATE hysterectomy trial: a multicentre randomised trial comparing abdominal, vaginal and laparoscopic methods of hysterectomy, Health Technol. Assess. 8 (26) (2004) 1–154.
[45] M. Sculpher, A. Manca, J. Abbott, J. Fountain, S. Mason, R. Garry, Cost effectiveness analysis of laparoscopic hysterectomy compared with standard hysterectomy: results from a randomised trial, BMJ 328 (7432) (2004) 134.
[46] R. Hurskainen, J. Paavonen, Levonorgestrel-releasing intrauterine system in the treatment of heavy menstrual bleeding, Curr. Opin. Obstet. Gynecol. 16 (6) (2004) 487–490.