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The need for accredited training in gynaecological oncology: a report from the European Network of Young Gynaecological Oncologists (ENYGO)

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Background: Primary data on training experiences of European gynaecological oncology trainees are lacking. This study aims to evaluate trainee profile, satisfaction and factors affecting the training experience in gynaecological oncology in Europe.

Patients and methods: A web-based anonymous survey sent to ENYGO members/trainees in July 2011. It included sociodemographic information and a 22-item (1–5 Likert scale) questionnaire evaluating training experience in gynaecological oncology. Chi-square tests were used for evaluating the independence of categorical variables and *t*-test (parametric)/Mann–Whitney (non-parametric) tests for differences between two independent groups on continuous data. Cluster analysis was used to identify groupings in multivariate data and Cronbach's-alpha for questionnaire reliability. A multivariable linear regression model was used to assess the effect of variables on training satisfaction.

Results: One hundred and nineteen gynaecological-oncology trainees from 31 countries responded. The mean age was 37.4 (S.D, 5.3) years and 55.5% were in accredited training posts. Two clusters identified in the cohort (Calinski–Harabasz, CH = 47.35) differed mainly by accredited training ($P = 0.003$). The training-satisfaction score (TSS) had high reliability (Cronbach's alpha, 0.951) and was significantly associated with accredited posts ($P < 0.0005$), years of training ($P = 0.001$) and salary ($P = 0.002$). The TSS was independent of age ($P = 0.360$), working hours ($P = 0.620$), overtime-pay ($P = 0.318$), annual leave ($P = 0.933$), gender ($P = 0.545$) and marital status ($P = 0.731$). Accredited programme trainees scored significantly higher than others in 17 of 22 aspects of training. The areas of greater need included advanced laparoscopic/urological/colorectal surgery, radiation oncology, palliative-care, cancer genetics and research opportunities.

Conclusions: Our data demonstrate the importance of accredited training and the need for harmonisation of gynaecological oncology training within Europe.

Key words: accredited programme, ENYGO, ESGO, Europe, gynaecological oncology, training

introduction

The necessity for a separate sub-specialty in gynaecological oncology and a distinct training programme to achieve this was recognised by the American Board of Obstetrics and Gynaecology [1] in 1969 and subsequently the Royal College of Obstetrics and Gynaecology (RCOG) in 1982 [2] who laid down clear guidelines, requirements and curricula for training [3, 4]. The importance of this is reflected in improved outcomes for patients with gynaecological cancer treated by trained gynaecological oncologists [5, 6]. However, gynaecological oncology still remains unrecognised as a sub-specialty in a number of countries and well-structured training programmes are unavailable in many countries. Training in gynaecological oncology is geared towards the development of

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an individual who is competent to perform independent practice to the standard of a specialist gynaecological oncologist. Training in this sub-speciality is demanding and arduous, as trainees need to master complex surgical skills as well as develop non-surgical proficiencies covering medical and radiation oncology, palliative care, cancer genetics and research. In addition, advancements in scientific knowledge and new technologies used in clinical practice need to be incorporated into the training programmes.

These issues are being addressed by the European Society of Gynaecological Oncology (ESGO) leading to the development and implementation of a pan-European accredited training programme in this sub-specialty. The European Network of Young Gynaecological Oncologists (ENYGO) is a network of juniors and trainees in Gynaecological oncology and related sub-specialties, established within and supported by ESGO. It is the principal network, representing the needs and aspiration of all European trainees involved in the study, prevention and treatment of gynaecological cancer. ENYGO (www.enygo.org) has ~400 members from 40 countries across Europe with each country having a national representative. We earlier reported on the differences in training systems in Europe [7]. However, there is complete lack of primary data describing the profile and experiences of gynaecological oncology trainees across Europe. In this paper, we report on the current profile, opinion and factors affecting the training experience of European gynaecological oncology trainees, following a survey undertaken by ENYGO.

methods

A web-based anonymous survey was sent to all listed in the ENYGO database in July 2011. This included both active ENYGO members and additional trainees ascertained through informal networks via ENYGO national representatives. The questionnaire was developed in several stages (supplementary Table S1, available at *Annals of Oncology* online). It included basic sociodemographic information and general details regarding training: years of experience, country of training, type of training institute, annual salary, study leave, working hours, maternity and paternity leave, primary field of training, current post, whether the training undertaken was in an accredited centre, and the institution providing accreditation. A specially developed 22-item questionnaire covering different aspects of gynaecological oncology training was filled by trainees in gynaecological oncology to evaluate their perception of training. The trainees used a scale of 1–5 (1 indicates strong disagreement and 5 indicates strong agreement) to indicate how strongly they agreed/disagreed with each statement/item in the questionnaire. The sum of scores for each of the 22 items provided a composite 'training-satisfaction score' (TSS) to reflect overall satisfaction with training.

Baseline characteristics were described using descriptive statistics. A chi-square test was used to compare categorical variables and *t*-Test (parametric)/Mann–Whitney (non-parametric) tests to compare continuous variables between two independent samples. The Kruskall–Wallis test (non-parametric) was used to compare the continuous outcome variables between more than two independent samples. Pearson's (parametric)/Spearman's (non-parametric) tests were used to assess the correlation between continuous variables. Cluster analysis using the Euclidian distance and Ward's linkage criterion was used to reveal natural groupings (or clusters) within the dataset that would otherwise not be apparent. Dendrograms were used to assess clustering of data labelled by country of training and presence of an accredited training programme. The Calinski–Harabasz (CH) index (pseudo-*F* score) was used to identify the ideal number of clusters. Cronbach's alpha was used to assess the internal reliability of the training satisfaction questionnaire. A multivariable linear regression model was used to evaluate the effect of different variables on TSS. Analyses were undertaken in STATA-12.

results

Of 997 survey invitations sent, 40 'bounced' and 298 individuals responded giving an apparent response rate of 31%. Of these, 119 were currently undertaking training in gynaecological oncology in 31 European countries (supplementary Figure S2, available at *Annals of Oncology* online) and are included in this analysis. The 179 exclusions included: 24 certified gynaecological oncologists (completed sub-specialty training), 16 consultants in obstetrics and gynaecology, 40 trainees in obstetrics and gynaecology, 92 with current post unspecified and unfilled 22-item gynaecological oncology training questionnaire, 5 working in medical/radiation oncology, and 2 trainees from Canada and Argentina.

The baseline characteristics of trainees are described in Table 1. The mean age of trainees' was 37.4 (S.D, 5.3) years, 66.4% were men and 33.6% women. Sixty-seven percent of trainees worked in a cancer centre, 55.5% were in an accredited training programme, 65.8% were ESGO and 44% ENYGO members. The mean scores of the different items in the training satisfaction questionnaire are given in Figure 1. Overall, most trainees rate their training in endometrial cancer surgery/case management and basic laparoscopic surgery as excellent (mean score >4 or 80% on a 0%–100% scale). Training in ovarian cancer surgery/case management, colposcopy, medical oncology, cervical and vulval cancer surgery/case management, advanced debulking surgery and the opportunity to attend meetings/courses score reasonably at >3.5. However, training in urological and colorectal surgery, vaginal cancer surgery/case management, cancer genetics, palliative care, radiation oncology and research opportunities score relatively poorly (Figure 1). The questionnaire had a high Cronbach's alpha of 0.951 suggesting very good internal consistency/reliability. The Dendron plots obtained from exploratory cluster analysis are given in Figure 2. The CH index (CH pseudo-*F* score = 47.35) suggested that the ideal number of clusters were two. A comparison of various covariates between these two clusters found that they differed significantly according to current post being accredited for gynaecological oncology training ($P = 0.003$), and the presence of an accredited gynaecological oncology training programme in the country of training ($P = 0.013$), but not by salary ($P = 0.06$), annual leave ($P = 0.481$), study leave ($P = 0.573$), working hours ($P = 0.292$), gender ($P = 0.972$) or age ($P = 0.647$).

A comparison of trainees within and outside accredited training posts is given in Table 2. The trainees in accredited training programmes had a higher TSS ($P < 0.0005$) and significantly higher scores for 17 of 22 aspects of gynae-oncology training, compared with other trainees (Table 2). The trainees within and outside accredited programmes did not differ with respect to age ($P = 0.725$), salary ($P = 0.222$),

Table 1. Baseline characteristics of survey respondents

	Variable	$n = 119$
Age	Mean age (S.D) in years	37.4 (5.3)
Gender	Men	66.4%
	Women	33.6%
Marital status	Married	63.6%
	Living with partner	14.4%
	Single	20.3%
	Divorced/separated	1.7%
Salary	Mean salary in Euros/month (SD)	2674.1 (1530.1)
Type of hospital of work	University/teaching hospital, cancer centre	66.9%
	University/teaching hospital	23.7%
	District general hospital	6.8%
	Other	2.5%
Leave	Median annual leave in days (IQR)	30 (25, 32)
	Median study leave in days (IQR)	10 (5, 20)
	Median maternity leave in months (IQR)	12 (5, 15)
	Median fully paid maternity leave in months (IQR)	6 (4,12)
	Median paternity leave in weeks (IQR)	3 (1, 9.25)
	Median fully paid paternity leave in weeks (IQR)	2 (1, 8)
Hours of work	Mean working hours/week (SD)	50.6 (12.8)
Overtime Work	Mean overtime hours/month (SD)	41.4 (42.7)
	Always paid for overtime work	21%
	Occasionally paid for overtime work	21%
	Never paid for overtime work	58%
Accredited programme country of training	Yes	56.3%
	No	39.5%
	Don't know	4.2%
Current post accredited for sub-specialty training	Yes	55.5%
	No	22.7%
	Not applicable	21.8%
Institution providing recognition of accredited training post	Recognition by national specialist society	37.8%
	Recognition by ESGO	16%
	Recognition by other institution	10.9%
Description of current post	Sub-specialty trainee/fellow in gynaecological oncology (recognised training programme)	34.5%
	Research fellow in gynaecological oncology	9.2%
	Trainee in gynaecological oncology (outside certified programme)	15.1%
	Consultant gynaecologist with special interest in gynaecological oncology (not completed fellowship/sub-specialty training)	21%
	Clinical academic trainee/fellow in gynaecological oncology (recognised training programme)	2.5%
	Consultant obstetrician and gynaecologist undergoing sub-specialty training in gynaecological oncology	11.8%
	Senior trainee in obstetrics and gynaecology undergoing sub-specialty training in gynaecological oncology	5.9%
Primary field of work	Gynaecological oncology	83.2%
	Obstetrics and gynaecology	16.8%
ESGO member	Yes	65.8%
	No	34.2%
ENYGO member	Yes	43.7%
	No	55.5%
Years of training	Mean years of training (SD)	8.1 (3.7)
Degree Held	MD	77.3%
	PhD	28.6%
	MRCOG	18.5%
	MSc	8.4%
	MRCS	3.4%
Degree studying for	MD	12.6%
	PhD	26.1%

S.D, standard deviation; IQR, interquartile range.

My training programme provides adequate exposure /opportunity to learn	Mean Score	S.D
Ovarian cancer surgery	3.83	1.30
Ovarian cancer complex case management	3.88	1.14
Cervical cancer surgery	3.83	1.21
Cervical cancer complex case management	3.84	1.13
Endometrial cancer surgery	4.37	0.95
Endometrial cancer complex case management	4.20	0.98
Vaginal cancer surgery	3.12	1.34
Vaginal cancer complex case management	3.14	1.27
Vulval cancer surgery	3.81	1.25
Vulval cancer complex case management	3.79	1.22
Basic laparoscopic surgery	4.01	1.41
Advanced laparoscopic surgery	3.48	1.52
Colposcopy	3.93	1.26
Colorectal surgery	3.03	1.51
Urological surgery	3.01	1.38
Advanced debulking surgery	3.64	1.36
Medical Oncology	3.66	1.20
Radiation oncology	3.21	1.29
Palliative Care	3.35	1.31
Research Opportunity	3.31	1.27
Cancer Genetics	3.14	1.28
Attend meetings and courses	3.81	1.22

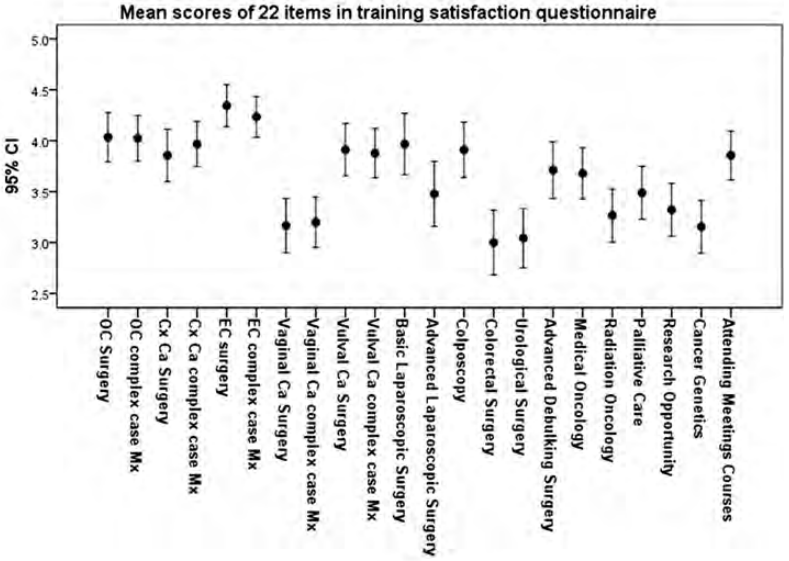

Figure 1. Mean scores of items in training satisfaction questionnaire.
OC, ovarian cancer; Cx, cervical; Ca, cancer; EC, endometrial cancer; Mx, management.

working hours per week ($P = 0.765$), years spent in training ($P = 0.369$), gender ($P = 0.942$), marital status ($P = 0.339$), overtime pay ($P = 0.133$), ESGO membership ($P = 0.558$), annual leave ($P = 0.06$) or study leave ($P = 0.154$).

The mean TSS was 72.5 (S.D, 27.1) for all trainees, and the mean TSS distribution by country is given in supplementary Figure S2, available at *Annals of Oncology* online. Table 3 depicts the effect of different variables on TSS. A higher TSS was associated with training in accredited training posts ($P < 0.0005$), training in cancer centres ($P = 0.018$), presence of accredited programmes in the country of training ($P = 0.001$), type of training post ($P < 0.005$) and was positively correlated with years of training ($P = 0.002$), net salary ($P = 0.001$) and study leave ($P = 0.03$). The TSS was independent of age ($P = 0.360$), working hours ($P = 0.620$), overtime pay ($P = 0.318$), annual leave ($P = 0.933$), gender ($P = 0.545$) and marital status ($P = 0.731$) (Table 3). The variables which remained significantly associated with TSS on multivariable regression analysis included training undertaken in an accredited post ($P < 0.0005$), years of training ($P = 0.001$) and salary ($P = 0.002$) (Table 4).

discussion

This is the first broad-based survey on the training of European trainees in gynaecological oncology. The older age of gynaecological oncology compared with general obstetrics and gynaecology trainees is consistent with the need for obtaining general obstetrics and gynaecology competencies before commencing the sub-speciality training as well as time spent undertaking research. Only one in three gynaecological oncology trainees unlike two in three general obstetrics and gynaecology trainees [8] were women. This may reflect the demanding nature of training which makes having a family and maintaining a good work-life balance more difficult, leading to fewer women choosing this sub-specialty. This anomaly needs rebalancing and increasing flexible training opportunities may facilitate this. A high 58% trainees were not paid for overtime work despite working an average 41 overtime/additional hours. Only 55.5% trainees were in accredited training posts, of which 38% were recognised by their nationalist specialist society and 16% by ESGO. 37.7% gynaecological oncology trainees described themselves as senior trainees/consultants in obstetrics and gynaecology and 9.1% as research fellows undergoing gynaecological oncology training. These findings' reflect the wide variation in opportunity, quality and structure of training programmes as well as terminology of training posts across Europe. While some countries, like the Netherlands and UK, have well run national accredited gynaecological oncology training programmes, this is lacking in a large proportion of European countries [7, 9]. To harmonise gynaecological oncology training across Europe, over the last few years, ESGO has developed a well-structured training programme with a detailed curriculum and competency based log-book as well as an accreditation system for training centres, with defined programme requirements including medical staff, equipment and infrastructural requirements [10, 11]. However, in 2012 the

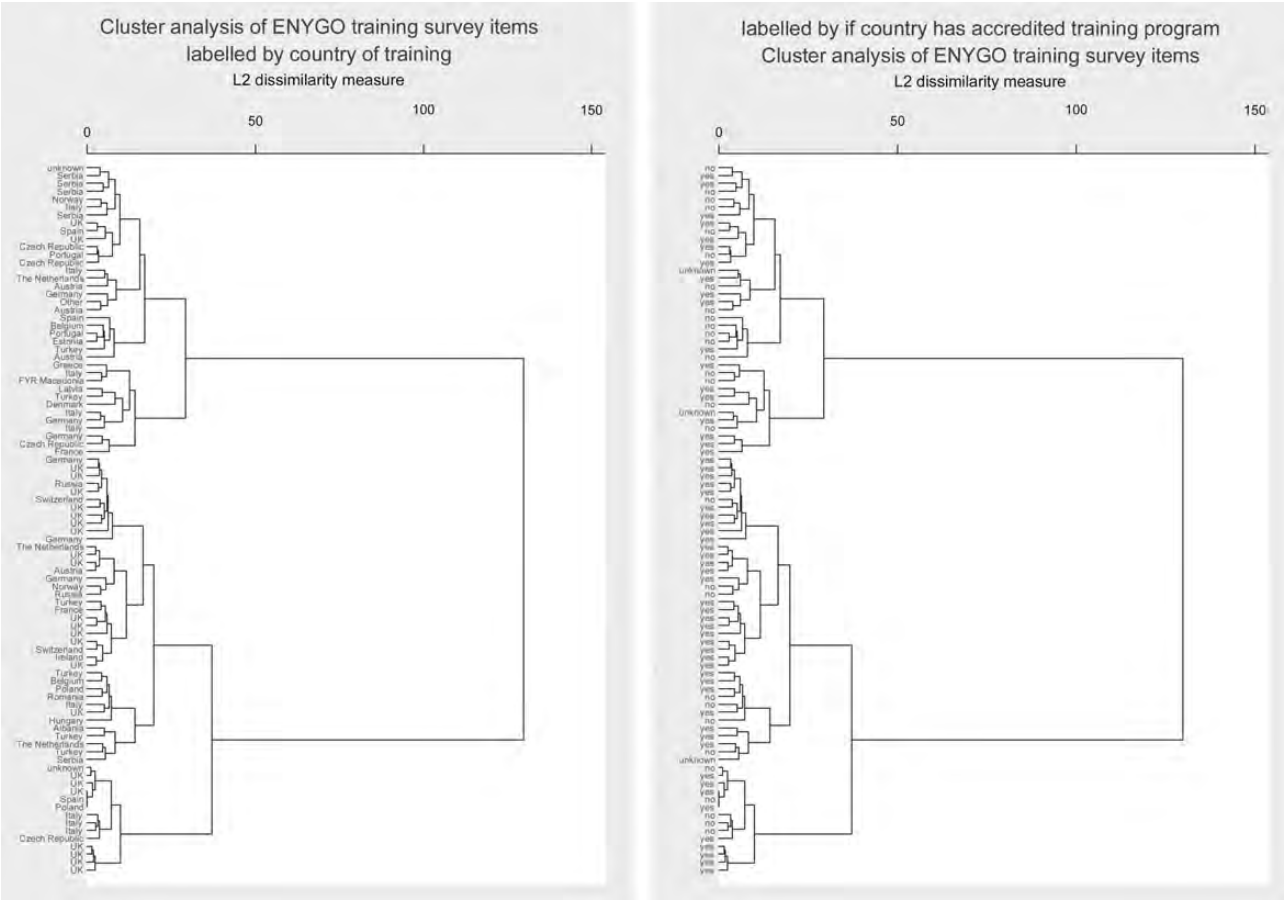

Figure 2. Dendron plots of cluster analysis labelled by the country of training and presence of an accredited training programme in the country of training.

ESGO accredited training centres included only 29 centres across Europe along with recognition accorded to all RCOG accredited centres in the UK and the Dutch society of Obstetrics and Gynaecology accredited centres in the Netherlands. This reflects a large gap that needs to be filled.

To the best of our knowledge, this is the first comprehensive survey covering different competencies expected from fellows during their training in gynaecological oncology. Previous reports have focused on specific topics like laparoscopic surgery [12], surgical anatomy [13] and wet lab models [14]. Our data identify differences in training opportunities experienced by European trainees across various aspects of training. The poor scores on training in urological and colorectal surgery, vaginal cancer surgery and case management, cancer genetics, palliative care, radiation oncology and research opportunities probably reflect limited access to training in these areas for a large number of trainees. The exploratory cluster analysis highlighted the presence of two distinct clusters in the cohort. Labelling of the clusters by country or presence of accredited training was suggestive of countries like the UK, the Netherlands, Poland, Switzerland countries with accredited programmes segregating mainly in cluster 2 (Figure 2). The two clusters differed significantly according to the presence of accredited training, but not by other covariates of interest like age, gender, salary, annual leave and study leave. No item in the training questionnaire scored lesser than 3 for trainees in accredited programmes, with 13 of the 22 items scoring over 4. On the other hand, 8 items scored lesser than 3, 15 items scored lesser than 3.5 and only 2 items scored greater than 4.0 for other trainees outside accredited programmes (Table 2). Accredited posts provided better opportunities for training in most cancer surgery, advanced debulking, colorectal and urological surgery, colposcopy as well as exposure to allied sub-specialties like radiation oncology, medical oncology, cancer genetics, palliative care and opportunities for research and attending meetings. The overall TSS was 83.5 for those in accredited programmes compared with 58.9 for those outside accredited programmes ($P < 0.0005$). Although, the survey did not specifically enquire regarding out-patient experience, individual case load and development of operative independence, these parameters are likely to be better for trainees working in accredited training programmes. Other demographic characteristics and covariates, like age, gender, marital status, years of training, annual leave, study leave, salary, working hours, were not statistically different between trainees within and outside accredited programmes. These data illustrate a clear distinction between trainees within and outside accredited training programmes. The former are more satisfied with most aspects of their training and have far better opportunities to attain all the required competencies for becoming a consultant gynaecological oncologist. This is likely because accredited programmes are better structured, with formalised training and assessments. Accredited hospitals/centres need to meet a

Table 2. Comparison of accredited training posts and those outside accredited training programmes

		Accredited training post	Training posts outside accredited programmes	*P* value
Age	Mean age in years (S.D)	36.8 (4.5)	38.1 (6.1)	0.725
Working hours	Working hours/week	50.6 (10.9)	50.5 (14.9)	0.765
Salary	Salary in euros/month	2529.2 (1478.6)	2793.8 (1572.9)	0.222
Training	Number of years in training	8.4 (3.9)	7.8 (3.4)	0.369
Annual leave	Mean annual leave in weeks (SD)	29.6 (5.3)	31.3 (32.1)	0.055
	Median annual leave in weeks (IQR)	30 (7)	28.5 (5)	
Study leave	Mean study leave in days (S.D)	21 (40.7)	21.1 (52.8)	0.152
	Median study leave in days (IQR)	10 (20)	10 (18)	
Gender	Male	44/66 (66.7%)	35/53 (66%)	0.942
	Female	22/66 (33.3%)	18/53 (34%)	
Marital status	Married	46/65 (70.8%)	29/53 (54.7%)	0.339
	Living with partner	7/65 (10.8%)	10/53 (18.9%)	
	Single	11/65 (16.9%)	13/53 (24.5%)	
	Divorced/separated	1/65 (1.5%)	1/53 (1.9%)	
Institute of training	University/teaching hospital, cancer centre	51/66 (77.3%)	28/52 (53.8%)	0.04
	University/teaching Hospital	10/66 (15.2%)	18/52 (34.6%)	
	District general hospital	3/66 (4.5%)	5/52 (9.6%)	
	Other	2/66 (3%)	1/52 (1.9%)	
Overtime Pay	Never	39/66 (59.1%)	30/53 (56.6%)	0.133
	Occasionally	10/66 (15.2%)	15/53 (28.3%)	
	Always	17/66 (25.8%)	8/53 (15.1%)	
Primary field of Work	Gynaecological Oncology	55/66 (83.3%)	44/53 (83%)	1.00
	Obstetrics and gynaecology	11/66 (6.7%)	9/53 (7%)	
ESGO membership	Yes	41/65 (63.1%)	36/52 (69.2%)	0.558
	No	24/65 (36.9%)	16/52 (30.8%)	
ENYGO membership	Yes	31/66 (47%)	21/53 (39.6%)	0.461
	No	35/66 (53%)	32/53 (60.4%)	
Country of training has accredited training programmes	Yes	55/66 (82.1%)	12/53 (22.6%)	<0.0005
	No	10/66 (15.2%)	37/53 (69.8%)	
	Don't know	1/66 (1.5%)	4/53 (7.5%)	
Training satisfaction questionnaire mean score (SD)	Ovarian cancer surgery	4.26 (0.93)	3.27 (1.5)	<0.0005
	Ovarian cancer complex case management	4.08 (1.1)	3.63 (1.2)	0.034
	Cervical cancer surgery	4.08 (1.06)	3.47 (1.32)	0.012
	Cervical cancer complex case management	4.02 (1.07)	3.6 (1.18)	0.059
	Endometrial cancer surgery	4.52 (0.85)	4.16 (1.05)	0.058
	Endometrial cancer complex case management	4.33 (0.97)	4 (0.96)	0.082
	Vaginal cancer surgery	3.47 (1.15)	2.6 (1.45)	0.002
	Vaginal cancer complex case management	3.34 (1.16)	2.84 (1.38)	0.044
	Vulval cancer surgery	4.18 (1.06)	3.31 (1.33)	0.001
	Vulval cancer complex case management	4.06 (1.1)	3.39 (1.28)	0.004
	Basic laparoscopic surgery	4.17 (1.3)	3.76 (1.55)	0.156
	Advanced laparoscopic surgery	3.63 (1.45)	3.26 (1.61)	0.218
	Colposcopy	4.14 (1.24)	3.64 (1.24)	0.040
	Colorectal surgery	3.39 (1.34)	2.49 (1.61)	0.003
	Urological surgery	3.35 (1.18)	2.48 (1.5)	0.002
	Advanced debulking surgery	3.92 (1.14)	3.19 (1.5)	0.010
	Medical oncology	3.92 (1.03)	3.27 (1.34)	0.008
	Radiation oncology	3.69 (1.06)	2.5 (1.29)	<0.0005
	Palliative care	3.77 (1.13)	2.73 (1.32)	<0.0005
	Research opportunity	3.7 (1.02)	2.73 (1.39)	<0.0005
	Cancer genetics	3.65 (1.03)	2.36 (1.24)	<0.0005
	Attend meetings and courses	4.03 (1.1)	3.51 (1.33)	0.031
	Overall mean TSS	83.5 (18.1)	58.9 (30.2)	<0.0005

Table 3. Factors affecting overall training-satisfaction score (TSS)

Variable		Mean TSS (SD)	*P* value (test)
Current post accredited for gynaecological oncology training	Yes	83.5 (18.1)	<0.0005 (Mann–Whitney)
	No/NA	58.9 (30.2)	
Gender	Male	73.8 (26.1)	0.545 (Mann–Whitney)
	Female	70.1 (29.1)	
Presence of accredited training programmes in country of training	Yes	80 (23.6)	0.001 (Kruskall –Wallis)
	No	64.9 (27.2)	
	Don't know	44 (35.9)	
Marital status	Married	74.6 (24.6)	0.731 (Kruskall–Wallis)
	Living with partner	67.7 (25.2)	
	Single	67.5 (34.4)	
	Divorced/separated	80 (41)	
Institute of training	Univeristy/teaching hospital, cancer centre	77 (26.1)	0.018 (Kruskall–Wallis)
	University/teaching hospital	62 (27.5)	
	District general hospital	63 (27.6)	
	Other	66.7 (16.2)	
Overtime pay	Never	69.7 (28.5)	0.318 (Kruskall– Wallis)
	Occasionally	72 (28.1)	
	Always	80.8 (20.4)	
Primary field of work	Gynaecological oncology	72.8 (28.3)	0.447 (Mann–Whitney)
	Obstetrics and gynaecology	71.5 (20.5)	
Current post	Sub-specialty fellow/trainee in gynaecological oncology	86.3 (15.8)	<0.0005 (Kruskall–Wallis)
	Research fellow in gynaecological oncology	60.9 (30.4)	
	Trainee in gynaeoncology (outside a certified programme/post)	55.1 (30.5)	
	Consultant gynaecologist with special interest in gynaecological oncology (not completed fellowship/sub-specialty training)	64.6 (31.7)	
	Clinical academic trainee/fellow in gynaecological oncology (recognised training programme)	86.8 (6.6)	
	Consultant obstetrician and gynaecologist undergoing sub-specialty training in gynaecological oncology	68.1 (20.1)	
	Senior trainee in Obstetrics and gynaecology undergoing sub-specialty training in gynaecological oncology	78.7 (19.4)	
ESGO membership	Yes	74.7 (29.1)	0.405 (Mann–Whitney)
	No	71.5 (26.4)	
ENYGO membership	Yes	73.2 (28.1)	0.572 (Mann–Whitney)
	No	71.8 (26.4)	
TSS	Overall TSS score for cohort	72.5 (27.1)	
Correlation with TSS	Mean years of training (SD)	8.1 (3.7)	$P = 0.002$ (Spearman's rho)
	Mean working hours/week (SD)	50.6 (12.8)	$P = 0.620$ (Spearman's rho)
	Mean Age in years (S.D)	37.4 (5.3)	$P = 0.360$ (Spearman's rho)
	Mean Salary in Euros (S.D)	2674.1 (1530.1)	$P = 0.001$ (Spearman's rho)
	Mean Annual leave in days (S.D)	30.3 (21.7)	$P = 0.933$ (Spearman's rho)
	Mean Study leave in days	21.02 (46.4)	$P = 0.03$ (Spearman's rho)

SD, standard deviation.

Table 4. Multivariate linear regression analysis for training-satisfaction score (TSS)

Model	Unstandardised coefficients		t	Significance	95% confidence interval for B	
	B	Std. error			Lower bound	Upper bound
(Constant)	26.482	19.778	1.339	0.184	−12.757	65.720
Current training post accredited for sub-specialty training	20.438	5.394	3.789	0.000	9.736	31.141
Years of training	2.011	0.630	3.192	0.002	0.761	3.261
Salary	0.004	0.001	2.868	0.005	0.001	0.007
Age	−0.176	0.444	−0.396	0.693	−1.058	0.706
Gender	0.844	4.813	0.175	0.861	−8.705	10.392
Training institute cancer centre	7.696	4.846	1.588	0.115	−1.918	17.310
Presence of accredited programme in country of training	−0.906	5.517	−0.164	0.870	−11.850	10.039
Study leave in days	−0.013	0.047	−0.269	0.789	−0.106	0.080

minimal case load of new patients ensuring that trainees can perform a minimal volume of cases deemed essential for training. Our data show that these centres are more likely to be cancer centres with centralisation of services and cases which maximises training for fellows and maintains surgical skills of their trainers. They are also more likely to have ancillary support services like radiology, radiation and medical oncology, social services, intensive care, blood banking, rehabilitation, psychology, cancer genetics, end-of-life support and access to other medical and surgical disciplines. Trainees in these centres learn to work in multidisciplinary teams with the patient as the focus of care to optimise outcomes. Other covariates significantly associated with the TSS were salary and total years in training. We can postulate that accredited posts are likely to be better funded enabling the trainee to focus predominantly on their gynaecological oncology training and reducing the necessity to supplement income from other sources like locum work. More experienced trainees are likely to undertake complex surgical procedures at an earlier stage and have a shorter learning curve than less experienced ones. All this maximises training opportunities which can explain the resulting higher satisfaction with training.

The lack of difference in endometrial cancer surgery experience between accredited and non-accredited posts may be due to most cases being early-stage disease involving less complex surgery which can be undertaken at most hospitals. Although training opportunities for advanced laparoscopic surgery were not significantly different between accredited and non-accredited centres, the overall score for advanced laparoscopic surgery was lower than all other types of gynaecological oncology surgery (except vaginal cancer surgery). This reflects a general relative dearth of training opportunities for advanced laparoscopic surgery. The lower scores for vaginal cancer surgery may largely be a reflection of the low incidence of disease with only a few new cases per year attending cancer centres. Further centralisation of vaginal cancer services as in the case of management of choriocarcinoma/gestational trophoblastic disease could lead to sufficient caseload in super-specialist centres but would necessitate rotation of trainees to these centres for training purposes. However, this would involve significant reorganisation of services and may be impractical at this juncture.

There appears to be fewer opportunities for trainees to develop more complex surgical skills like advanced debulking, advanced laparoscopic, urological and colorectal surgeries compared with less complex skills such as a standard hysterectomy for endometrial cancer surgery. This is particularly the case for urological and colorectal surgery, which scores less than 3.5 in accredited and less than 2.5 in non-accredited centres. Acquiring advanced surgical skills is an apprenticeship. In addition, the frequency of procedures may vary across centres and even between consultants within the centres. The management of complex situations like urologic/bowel complications may not always be suitable for immediate hands on training for all trainees. The development of complex surgical skills can be facilitated by dedicated workshops, wet lab, cadaveric, simulator training, watching surgical videos and working as an embedded member of the colorectal and urological teams. ESGO provides access to e-learning lecture series, a text book and also promotes and endorses workshops and master classes which facilitate training needs. Our survey indicates that trainees need more support with respect to learning cancer genetics, radiation oncology and palliative care. Training centres, ESGO and national specialist societies need to expand their efforts to cover areas of greater need highlighted by our survey.

A large proportion of trainees had obtained (28.6%) or was currently studying for (26.1%) a higher degree: PhD. However, the mean score for adequate research opportunities within training was low (3.31). Further investigation is required to better understand the difficulties with respect to research encountered by most trainees. The data reflect the need for training programmes, centres and educational supervisors to increase support and research opportunities for trainees. Increased funding and dedicated research time may be a way forward. While understanding and conducting research is a necessary part of training, it is important for trainees to get the right balance since the increased research time may impact on the duration of training, as some trainees may take longer to attain the complex surgical competencies required [15].

The analysis of mean TSS for each country (supplementary Figure S2, available at *Annals of Oncology* online) shows that training in the Netherlands, UK, Switzerland, Belarus,

Hungary, Slovak Republic, Ireland and Poland is in the first quartile, whereas that in Belgium, Demark, Estonia, Macedonia, Greece, Latvia and Lithuania make up the lowest quartile. Albania, Austria, France, Italy, Norway, Turkey and Serbia lie in the second quartile, while Armenia, Czech Republic, Germany, Portugal, Ro mania, Russia, Spain and Sweden are in the third quartile. Although this shows that broadly trainees in countries with accredited programmes lie in the first two quartiles and those in countries without accredited programmes largely make up the last two quartiles [7, 9], there may be some overlap as this distribution and inference are limited by the small number of respondents in a number of countries and the presence of both accredited and non-accredited centres in many countries, such as Sweden and Denmark.

Our survey is limited by the lack of qualitative data on training experience. Although the response rate is 'apparently' small, this is explained by the sample largely comprising of trainees in general obstetrics and gynaecology, allied sub-specialties and those having completed their training, most of whom would not have responded to the survey. While the true number of gynaecological oncology trainees across Europe is unknown given the lack of a central register in most countries and at ESGO, we estimate this number to be around 190–240. Hence, the true response rate is probably ≥50%, which is acceptable for survey-based research and comparable with reports by others [16, 17]. Additionally, our survey is broadly representative of European trainees as it includes respondents from 31 countries.

Our study provides valuable primary data of benefit to training programme organisers, educational supervisors, nationalist specialist societies and ESGO, as well as trainees themselves. It demonstrates the importance of accredited training and identifies areas of greater need to guide resource allocation and optimise training outcomes. It also highlights the requirement for a European register of trainees to monitor and evaluate training experience. The data re-emphasise the urgent need for harmonisation of gynaecological oncology training in Europe and importance of all training being undertaken only in accredited centres within accredited programmes. This is necessary to ensure that all future gynaecological oncologists in Europe are appropriately trained to the same minimum expected standard. To facilitate this, ESGO is refocusing its resources on providing accreditation and increasing accredited centres in European countries which lack well-organised structured training programmes accredited and co-ordinated through their national specialist society.

ethics approval

The study was submitted for consideration and reviewed by the UCLH/UCL/RF Joint Biomedical Research Unit. As it aimed to assess the effectiveness of existing training programmes (not all within the NHS), and make recommendations for improvements, it did not meet the requirements of a 'research study' as defined by the National Research Ethics Service. Hence, it was deemed not to require a formal ethics approval (opinion received 12 January 2011).

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disclosure

The authors have declared no conflicts of interest.

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