

Current Situation and Demand for Continuing Medical Education (CME) for Obstetricians and Gynecologists

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Objective: To explore the needs of obstetricians and gynecologists with different working years for the contents and forms of CME.

Methods: The online questionnaire was distributed on the largest academic training platform for obstetrics and gynecology in China from April 2020 to May 2020. The survey contents mainly included the training forms and training contents of CME, as well as the mastery of diseases by doctors with different working years.

Results: 4458 questionnaires were returned, of which 3954 questionnaires were included in the study. There was a significant ($p < 0.001$) positive correlation between the mastery of 19 diseases by obstetricians and gynecologists with different working years. After adjusting for specialist departments, hospital grades, nature of units and ages, it was found that there was no statistically significant difference between the groups in gynecological endocrine-related diseases, such as precocious puberty/delayed puberty, and there was also no statistically significant difference between the groups of shorter working years in infertility, menopausal syndrome, hyperprolactinemia and premature ovarian failure.

Conclusion: The most popular training content for obstetricians and gynecologists with different working years is common gynecological endocrine diseases, of which abnormal uterine bleeding, menopausal syndrome, polycystic ovarian syndrome and cervical lesions are the most selected diseases, and the most popular form of training is online.

Keywords: continuing medical education, working years, internet, obstetrics and gynecology

Introduction

Worldwide, physicians must retain and enhance their problem-solving competencies and keep pace with the progress in their discipline of medicines.¹ In addition, patients have become more educated and demanding.² This varying behavior and new developments in medicines have greatly influenced the physicians' practicing circumstances, thus making continuing medical education (CME) a necessary component of every physician's life.³

Furthermore, one of the unresolved issues is that the physicians themselves are unable to appreciate their requirements adequately to cope with current medical advancements.⁴ Hence, all physicians must be encouraged to improve their medical competence through CME after the formal completion of their graduation and training.⁵ This practice not only provides expertise to the physicians but also satisfies the patients.⁶ During the last decade, stakeholders have brought significant

changes in the theoretical basis and teaching approaches of CME, which have modified clinical practices.⁷ The physicians learn a lot from the interactive sessions and educational events conducted for CME.³

Healthcare practitioners in knowledge-intensive industries need lifelong learning. CME reflects the concept of lifelong education. When medical students graduate, in order to maintain, develop and enhance medical knowledge, skills, various professional qualities and interpersonal relationships, so that they can meet the needs of patients, the public and the medical industry, medical professionals should continuously learn new theories, new knowledge and new technologies in their fields.¹

Unlike undergraduate medical education, CME is mainly based on self-learning and practice-based learning activities, with the main purpose of solving learners' actual work needs.² Medicine is to some extent an empirical science that requires repeated clinical practice. Doctors' perception of diseases is related to the number of years of work, and doctors learn and sensitively recognize diseases in practice, which in turn rises to rationality, so as to truly master the diagnosis and treatment of diseases. Grand rounds, case discussions, and academic conferences in daily work are all forms of continuing education, which are conducive to the improvement of professional level.

In this paper, we investigated the mastery of diseases and the demand for CME contents and forms by doctors with different working years in the form of an online questionnaire in order to fully understand the needs of learners, carry out targeted CME, improve the efficiency of CME, and help improve the medical level in China.

Materials and Methods

Study Design

The online questionnaire was distributed on the largest academic training platform for obstetrics and gynecology in China from April 2020 to May 2020 using the survey method of an online questionnaire. Gynecology-related training videos were given free of charge to physicians who completed the questionnaire, hoping to motivate as many physicians as possible to participate in the survey.

The questionnaire survey content is mainly aimed at the needs of obstetricians and gynecologists for training contents and training forms, and at the same time, the questionnaire survey content is adjusted according to the characteristics of discipline setting, so that it meets the actual situation of medical institutions in China. The content and design of the questionnaire were discussed and amended by the expert group and validated among small-scale obstetricians and gynecologists before being released on the web platform.

This survey research was approved by the institutional research ethics committee of Peking Union Medical College Hospital, Chinese Academy of Medical Sciences, the approval date was June 8, 2020, No. S-K 1206.

Respondents

Mainly for Chinese obstetricians and gynecologists, inclusion criteria: obstetricians and gynecologists as well as reproductive specialists, and exclusion criteria: non-gynaecologist, obstetrician, gynecological endocrinologist and fertility doctor, in the questionnaire, there were insufficient basic information, incomplete completion of survey content, and obvious logical errors or contradictions in the completion of the content. The participants provided informed consent through the online mode.

Investigation Content

Formulation of the Questionnaire

The content of the questionnaire is mainly aimed at common clinical gynecological diseases, and assesses the mastery of diseases and the expectation on the training contents and training forms by obstetricians and gynecologists. The questionnaire was formulated and reviewed by four specialists in obstetrics, gynecology and reproductive endocrinology. Thirty obstetricians and gynecologists were first asked to fill in the designed questionnaire, and the questionnaire was distributed on the internet after confirming that there were no omissions.

Content of Questionnaire

Basic demographic data, mainly including age, gender, years of working, nature of the hospital, hospital level and professional doctor.

The survey on training contents mainly includes the professional direction for strengthening (MultiSelect), including: common gynecological endocrine diseases, common obstetric diseases, common gynecological diseases, surgical skills and others; the most popular training contents (MultiSelect), including: abnormal uterine bleeding (AUB), polycystic ovarian syndrome, menopause syndrome, infertility, uterine leiomyomas and ovarian cyst, endometriosis and adenomyosis, cervical lesions, and obstetrics diseases.

The survey on training forms mainly includes the favorite training forms (online, on-site meeting, online + on-site training); the most productive training modes (traditional lecture, Problem-based learning (PBL) mode, scenario simulation); the ways expected to obtain profession-related resources and support (regular push by WeChat, professional website, meeting or forum, online) (MultiSelect). PBL is problem-based learning characterized by a process of problem proposal, discussion, and learning around a complex, multi-scene, practical problem-based topic or case in the form of problem-centered and student-oriented group discussion with the participation and guidance of counselors.³

The survey on the mastery of knowledge in disease diagnosis and treatment, including AUB, amenorrhea, PCOS, menopausal syndrome, infertility, uterine leiomyomas, endometriosis, gestational diabetes mellitus (GDM), pregnancy-induced hypertension (PIH), and so on, with a total of 19 common diseases. The mastery of knowledge is divided into four levels, including little understanding, understanding of small parts, being familiar with most parts, and comprehensive mastery.

Statistical Methods

SPSS 22.0 software was used for statistical analysis of the data. In this survey, the general demographic data (including age, gender, working year, etc.) and doctors' training contents, training forms and access to professional support were expressed as percentages or n (%). Univariate analysis was performed using the χ^2 test, with a test level of $\alpha = 0.05$, $P < 0.05$ considered as significantly different, and $P < 0.001$ considered as highly significantly different. Multivariate analysis was performed using ordinal multivariate logistic regression analysis with the degree of awareness of the disease as a dependent variable, working years as an independent variable, and the nature of the hospital, specialist, age, and hospital grade, as a covariate adjusting factor. For the independent variable, the working years ≤ 5 was used as a reference, with a test level of $\alpha = 0.05$.

Results

Basic Information

A total of 4458 questionnaires were returned, of which 3954 questionnaires met the inclusion and exclusion criteria and were included in the data analysis. The main reasons for exclusion were non-obstetricians and gynecologists, such as sonographers, administrative personnel, health care practitioner, nurse, teachers, etc.; in addition, the questionnaire with a single answer option for all questions was excluded.

Among the valid questionnaires, people aged 26–35 years old had working years ≤ 5 years and of 6–10 years; there was a positive correlation between people over 36 years old and working years. Obstetrician and gynecologists (Obs & Gynae), doctors in general hospitals and secondary hospitals account for the highest proportion of doctors with different working years. See the demographic data in [Table 1](#).

Survey on Mastery Level with 19 Kinds of Diseases by Doctors with Different Working Years

The grasp of diseases is divided into two major categories: low cognition (little understanding and small parts) and high cognition (being familiar with most parts and comprehensive mastery). Univariate chi-square analysis was used, and a high cognitive proportion $> 50\%$ was considered as better mastery of diseases.

Table 1 Summary of Participant Demographics [n, (%)]

		No. (%)	Years of Work, ≤5	Years of Work, 6–10	Years of Work, 11–20	Years of Work, >20
Total No.		3954	274	524	1205	1951
Gender	Female	3860 (97.62)	261 (95.26)	512 (97.71)	1174 (97.43)	1913 (98.05)
	Male	94 (2.38)	13 (4.74)	12 (2.29)	31 (2.57)	38 (1.95)
Age (year)	18–25	39 (0.99)	37 (13.50)	1 (0.19)	1 (0.08)	0 (0.00)
	26–35	701 (17.73)	219 (79.93)	392 (74.81)	90 (7.47)	0 (0.00)
	36–45	1677 (42.41)	15 (5.47)	125 (23.85)	1036 (85.98)	501 (25.68)
	46–55	1357 (34.32)	3 (1.09)	6 (1.15)	75 (6.22)	1273 (65.25)
	≥ 56	180 (4.55)	0 (0.00)	0 (0.00)	3 (0.25)	177 (9.07)
Specialist departments	Obstetrician	337 (8.52)	22 (8.03)	50 (9.54)	108 (8.96)	157 (8.05)
	Gynecologist	1164 (29.44)	90 (32.85)	154 (29.39)	371 (30.79)	549 (28.14)
	Obs & Gynae	2289 (57.89)	153 (55.84)	308 (58.78)	679 (56.35)	1149 (58.89)
	Gynecological endocrinologist and fertility doctor	164 (4.15)	9 (3.28)	12 (2.29)	47 (3.90)	96 (4.92)
Nature of hospital	Maternity and children hospital or reproductive hospital	1593 (40.29)	114 (41.61)	190 (36.26)	461 (38.26)	828 (42.44)
	General hospital	2210 (55.89)	154 (56.20)	308 (58.78)	708 (58.76)	1040 (53.31)
	Others	151 (3.82)	6 (2.19)	26 (4.96)	36 (2.99)	83 (4.25)
Hospital grades	Grade-one hospital	425 (10.75)	20 (7.30)	46 (8.78)	131 (10.87)	228 (11.69)
	Secondary hospital	2049 (51.82)	134 (48.91)	250 (47.71)	637 (52.86)	1028 (52.69)
	Tertiary hospital	1078 (27.26)	89 (32.48)	178 (33.97)	342 (28.38)	469 (24.04)
	Other hospital	402 (10.17)	31 (11.31)	50 (9.54)	95 (7.88)	226 (11.58)

Abbreviation: Obs & Gynae, obstetrician and gynaecologist.

Doctors with working years ≤ 5 years only had a high cognitive proportion > 50% in leiomyoma and family planning; doctors with working years 6–10 years had a high cognitive proportion > 50% in common gynecological diseases except for EM and twin pregnancy; and doctors with working years > 11 years had high cognitive proportion > 50% in common gynecological diseases. However, for the mastery of gynecological endocrine-related diseases, even doctors with working years > 11 years had a high cognitive proportion < 50% except for AUB, which was as high as 56.02%. From the statistical results, it can be seen that there is a clear correlation and a positive correlation between doctors' working years and mastery of 19 diseases, and the difference is statistically significant, $p < 0.001$. See the univariate chi-square analysis of mastery level (high cognition) in Table 2.

After adjusting for age, hospital type, hospital grades, and specialist departments, multiple regression analysis used ≤ 5 years as a reference to analyze the relationship between working years and mastery of diseases, and found that mastery of common gynecological and obstetric diseases was significantly correlated with working years, but mastery of some gynecological endocrine diseases was not correlated with working years. For mastery of precocious puberty/ delayed puberty, there was also no significant statistical difference between doctors with working years > 20 years and doctors with working years ≤ 5 years. For cognition of menopausal syndrome, hyperprolactinemia and premature ovarian failure,

Table 2 The Level of Mastery with 19 Kinds of Diseases by Obs & Gynae with Different Working Years (High Cognition)

	≤5 Years (n=274)	6–10 Years (n=524)	11–20 Years (n=1205)	>20 Years (n=1951)	χ^2	P
AUB	82 (29.93)	235 (44.85)	675 (56.02)	1404 (71.96)	278.53	<0.001
Amenorrhoea	56 (20.44)	172 (32.82)	539 (44.73)	1224 (62.74)	297.42	<0.001
PCOS	70 (25.55)	185 (35.31)	529 (43.90)	1132 (58.02)	175.34	<0.001
Infertility	39 (14.23)	74 (14.12)	275 (22.82)	743 (38.08)	187.09	<0.001
Menopausal syndrome	37 (13.50)	108 (20.61)	412 (34.19)	1117 (57.25)	405.18	<0.001
Precocious puberty/ delayed puberty	15 (5.47)	34 (6.49)	99 (8.22)	295 (15.12)	61.65	<0.001
Hyperprolactinemia	21 (7.66)	69 (13.17)	221 (18.34)	603 (30.91)	148.09	<0.001
POF	36 (13.14)	86 (16.41)	322 (26.72)	839 (43.00)	225.28	<0.001
HPV infection/ cervical lesions	121 (44.16)	310 (59.16)	781 (64.81)	1422 (72.89)	111.47	<0.001
Uterine leiomyoma	158 (57.66)	348 (66.41)	914 (75.85)	1582 (81.09)	104.36	<0.001
Ovarian cyst	116 (42.34)	274 (52.29)	754 (62.57)	1306 (66.94)	86.28	<0.001
Endometriosis	96 (35.04)	232 (44.27)	633 (52.53)	1162 (59.56)	84.71	<0.001
Family planning (contraception/IUD/ abortion)	156 (56.93)	375 (71.56)	1025 (85.06)	1753 (89.85)	256.03	<0.001
Routine labor process treatment	128 (46.72)	351 (66.98)	932 (77.34)	1564 (80.16)	167.10	<0.001
PIH	111 (40.51)	313 (59.73)	816 (67.72)	1419 (72.73)	129.13	<0.001
GDM	102 (37.23)	277 (52.86)	663 (55.02)	1124 (57.61)	41.20	<0.001
PROM	135 (49.27)	366 (69.85)	892 (74.02)	1498 (76.78)	95.95	<0.001
Premature delivery	113 (41.24)	336 (64.12)	827 (68.63)	1420 (72.78)	114.81	<0.001
Twin pregnancy	69 (25.18)	241 (45.99)	638 (52.95)	1210 (62.02)	155.96	<0.001

Abbreviations: AUB, abnormal uterine bleeding; PCOS, polycystic ovarian syndrome; HPV, human papilloma virus; IUD, intrauterine device; PIH, pregnancy-induced hypertension; GDM, gestational diabetes mellitus; PROM, premature rupture of membranes.

there were differences between doctors with working years ≤ 5 years and doctors with working years > 11 years; doctors with working years > 20 years showed statistical differences in mastery of infertility, shown in Table 3.

Survey on Training Contents and Training Forms

The professional direction for strengthening preferred by doctors with different working years was common gynecological endocrine diseases, and the proportion showed an increasing trend with the increase of working years. Surgical technique training and common gynecological diseases ranked second and third among doctors with working years of less than 20 years, while among doctors with working years of more than 20 years, the second choice was common gynecological diseases, and the third choice was surgical technique training. Obstetrics is the least selected training specialty. For most popular training content, doctors with all working years preferred abnormal uterine bleeding, doctors with working years ≤ 5 years and of 6–10 years selected PCOS as the second choice, and doctors with working years ≤ 5 years selected cervical lesions and doctors with working years of 6–10 years selected climacteric syndrome as the third choice. The first three choices were the same among doctors with working years of 11–20 years and > 20 years, except for AUB, which was followed by menopausal syndrome and PCOS. There was no difference in the favorite training form, the most productive training model and the way expected to obtain professional resources among doctors with

Table 3 The Analysis of Differences in Mastery of 19 Diseases by Obs & Gynae with Different Working Years After Adjusting for Multiple Factors

Years of Work	AUB		Amenorrhea		PCOS		Infertility	
	Exp (B) (95% CI)	P	Exp (B) (95% CI)	P	Exp (B) (95% CI)	P	Exp (B) (95% CI)	P
≤5 years	1.00		1.00		1.00		1.00	
6–10 years	1.76 (1.28–2.40)	0.00	1.69 (1.20–2.41)	0.00	1.46 (1.05–2.04)	0.02	0.89 (0.58–1.36)	0.59
11–20 years	2.22 (1.62–3.04)	0.00	2.10 (1.49–2.96)	0.00	1.69 (1.22–2.33)	0.00	1.24 (0.84–1.84)	0.29
>20 years	3.65 (2.52–5.30)	0.00	3.25 (2.20–4.80)	0.00	2.45 (1.68–3.56)	0.00	1.99 (1.28–3.08)	0.00
Menopausal syndrome			Precocious puberty/ delayed puberty		Hyperprolactinemia		POF	
Exp (B) (95% CI)		P	Exp (B) (95% CI)		P	Exp (B) (95% CI)		P
1.00			1.00			1.00		
1.42 (0.94–2.14)		0.09	1.10 (0.59–2.07)		0.76	1.62 (0.97–2.72)		0.06
1.92 (1.30–2.85)		0.00	1.16 (0.64–2.09)		0.63	1.78 (1.09–2.92)		0.02
3.28 (2.13–5.06)		0.00	1.85 (0.97–3.54)		0.06	2.62 (1.53–4.47)		0.00
HPV infection/ cervical lesions			Uterine leiomyomas		Ovarian cyst		Endometriosis	
Exp (B) (95% CI)		P	Exp (B) (95% CI)		P	Exp (B) (95% CI)		P
1.00			1.00			1.00		
1.79 (1.33–2.41)		0.00	1.40 (1.03–1.90)		0.03	1.47 (1.09–1.98)		0.01
2.10 (1.55–2.84)		0.00	1.99 (1.45–2.74)		0.00	2.08 (1.53–2.81)		0.00
2.91 (2.02–4.18)		0.00	2.57 (1.74–3.80)		0.00	2.48 (1.73–3.55)		0.00
Family planning (contraception/IUD/ abortion)			Routine labor process treatment		PIH		GDM	
Exp (B) (95% CI)		P	Exp (B) (95% CI)		P	Exp (B) (95% CI)		P
1.00			1.00			1.00		
1.85 (1.35–2.53)		0.00	2.41 (1.78–3.28)		0.00	2.20 (1.62–2.98)		0.00
3.70 (2.62–5.22)		0.00	4.07 (2.96–5.59)		0.00	2.99 (2.20–4.07)		0.00
5.15 (3.32–7.98)		0.00	5.13 (3.47–7.59)		0.00	3.89 (2.69–5.64)		0.00
PROM			Premature delivery			Twin pregnancy		
Exp (B) (95% CI)		P	Exp (B) (95% CI)		P	Exp (B) (95% CI)		P
1.00			1.00			1.00		
2.53 (1.86–3.45)		0.00	2.61 (1.93–3.55)		0.00	2.45 (1.80–3.47)		0.00
3.28 (2.40–4.48)		0.00	3.14 (2.31–4.28)		0.00	3.03 (2.18–4.19)		0.00
4.32 (2.95–6.33)		0.00	4.03 (2.78–5.84)		0.00	2.50 (2.92–6.23)		0.00

Abbreviations: AUB, abnormal uterine bleeding; PCOS, polycystic ovarian syndrome; HPV, human papilloma virus; IUD, intrauterine device; PIH, pregnancy-induced hypertension; GDM, gestational diabetes mellitus; PROM, premature rupture of membranes.

different working years, which were online + on-site training, scenario simulation and online courses as preferred choice respectively, shown in Table 4.

Discussion

Our survey showed that doctors with different working years presented a positive correlation in mastery of 19 kinds of diseases, and the difference in univariate chi-square analysis was statistically significant, $p < 0.001$. After adjusting for related factors, such as age, hospital type, hospital grades, specialist departments, it was found that for common gynecological and obstetric diseases, such as HPV infection and cervical lesions, leiomyoma, ovarian cyst,

Table 4 The Survey on the Training Contents, Training Forms and Ways to Obtain Professional Support Among Obs & Gynae with Different Working Years [n (%)]

	Parameters	Total No. (%)	≤5 Years (n=274)	6–10 Years (n=524)	11–20 Years (n=1205)	>20 Years (n=1951)
The professional direction for strengthening	Common gynecological endocrine diseases	3221 (81.46)	171 (62.41)	375 (71.56)	975 (80.91)	1700 (87.13)
	Common gynecological diseases	1474 (37.28)	128 (46.72)	192 (36.64)	427 (35.44)	727 (37.26)
	Common obstetric diseases	650 (16.44)	81 (29.56)	114 (21.76)	192 (15.93)	263 (13.48)
	Surgical skills training	1570 (39.71)	129 (47.08)	267 (50.95)	572 (47.47)	602 (30.86)
	Others	71 (1.80)	1 (0.36)	3 (0.57)	11 (0.91)	56 (2.87)
The most popular training content	AUB	3359 (84.95)	240 (87.59)	435 (83.02)	1051 (87.22)	1633 (83.70)
	Menopausal syndrome	2849 (72.05)	161 (58.76)	320 (61.07)	846 (70.21)	1522 (78.01)
	PCOS	2508 (63.43)	181 (66.06)	330 (62.98)	776 (64.40)	1221 (62.58)
	Infertility	2318 (58.62)	169 (61.68)	314 (59.92)	691 (57.34)	1144 (58.64)
	Adenomyosis/endometriosis	2053 (51.92)	163 (59.49)	282 (53.82)	645 (53.53)	963 (49.36)
	Uterine leiomyoma/ovarian cyst	1493 (37.76)	132 (48.18)	230 (43.89)	467 (38.76)	664 (34.03)
	Cervical lesions	2306 (58.32)	176 (64.23)	315 (60.11)	708 (58.76)	1107 (56.74)
	Obstetrics	1476 (37.33)	148 (54.01)	247 (47.14)	442 (36.68)	639 (32.75)
Perferred form of training	Online	1827 (46.21)	120 (43.80)	247 (47.14)	538 (44.65)	922 (47.26)
	On-site meeting	186 (4.70)	11 (4.01)	24 (4.58)	59 (4.90)	92 (4.72)
	Online + on-site training	1941 (49.09)	143 (52.19)	253 (48.28)	608 (50.46)	937 (48.03)
The most productive training modes	Traditional lecture	1266 (32.02)	75 (27.37)	132 (25.19)	331 (27.47)	728 (37.31)
	PBL	889 (22.48)	77 (28.10)	127 (24.24)	296 (24.56)	389 (19.94)
	Scenario simulation	1799 (45.50)	122 (44.53)	265 (50.57)	578 (47.97)	834 (42.75)
The ways expected to obtain profession-related resources and support	Regular push by WeChat	3225 (81.56)	227 (82.85)	428 (81.68)	990 (82.16)	1580 (80.98)
	Professional website	2034 (51.44)	158 (57.66)	286 (54.58)	610 (50.62)	980 (50.23)
	Meeting or forum	1740 (44.01)	132 (48.18)	234 (44.66)	540 (44.81)	834 (42.75)
	Online	3010 (76.13)	206 (75.18)	398 (75.95)	920 (76.35)	1486 (76.17)

Abbreviations: AUB, abnormal uterine bleeding; PCOS, polycystic ovarian syndrome; PBL, problem-based learning.

endometriosis, routine labor treatment, GDM, PROM and other diseases, the number of working years was significantly positively correlated with the mastery of diseases, and there was a statistically significant difference in mastery. However, there was no significant correlation with some gynecological endocrine diseases. For example, the mastery of precocious puberty was very low among doctors with different working years, and there was no statistically significant difference in mastery between doctors with working years > 20 years and doctors with ≤ 5 years. Analysis of the reason for this may be related to the low incidence of these two diseases in clinical practice,⁸ resulting in insufficient experience of doctors in their diagnosis and treatment.⁹ There was a Danish survey study showing a clinical incidence of precocious puberty of about 0.2% in girls and < 0.05% in boys.⁴ Delayed pubertal development affected approximately 2% of adolescents.⁵ There was no significant difference in mastery of infertility among doctors with working years < 20 years, and there was no difference in mastery of menopausal syndrome, hyperprolactinemia and POF among doctors with working years ≤ 5

years and of 6–10 years. It is speculated that because general obstetricians and gynecologists are more exposed to common gynecological and obstetric diseases in clinical work, and gynecological endocrine is a relatively independent branch discipline in obstetrics and gynecology,¹⁰ unlike common gynecological diseases that usually require surgical treatment,¹¹ the diagnosis and treatment of gynecological endocrine diseases¹² require proficiency in the functional characteristics of the hypothalamic-pituitary-ovarian axis.¹³ From our findings, the education of Chinese obstetricians and gynecologists in gynecological endocrine diseases is the most deficient and it is the disease type with the lowest mastery by clinicians.

Under the new situation, the development of CME is changing from a traditional model centered on teachers to a model that pays more attention to the needs of learners.^{2,5,14} Compared with medical education forms, CME educators and administrators may be more in need of fully understanding the learning needs of learners, and the learning needs are linked to their social roles¹⁵ and self-positioning.⁶ After understanding the mastery of 19 common diseases by Chinese obstetricians and gynecologists, it is not difficult to find that the training direction that doctors want to strengthen is closely related to the mastery of diseases, and is related to the working years of doctors. The mastery of common gynecological endocrine diseases is generally low among obstetrician and gynecologists with different working years, so it has become the preferred training direction.^{2,16,17} Since the department of obstetrics and gynecology belongs to the surgical department, doctors with working years < 20 years have more training needs for surgical techniques; while the doctors with working years > 20 years have enough working experience to improve surgical skills no longer their main training needs. The most popular training contents were AUB, PCOS and menopausal syndrome among doctors with different working years, and doctors with working years ≤ 5 years selected cervical lesions and did not select PCOS. Such choices meet the doctors' mastery of diseases and clinical work needs.¹⁸ Studies have found that the risk of HPV infection in humans is very high, and the incidence of cervical HPV infection is more than 80% in sexually active people.⁷ In 2018, 106430 new cases of cervical cancer and 47739 deaths were reported in China, accounting for 18.2% and 17.3% of the global incidence and mortality of cervical cancer.⁸ According to the 2020 Annual Work Report of National Cancer Center issued by the China National Cancer Center, cervical cancer is the sixth most common tumor with a high incidence in female cancer in China, and its mortality rate is the eighth in female malignant tumor.⁹ However, the incidence of PCOS reported worldwide accounts for 5–15% of women of reproductive age.¹⁰ Obstetricians and gynecologists have more chances of encountering patients with cervical lesions in clinical work than patients with PCOS, especially young physicians.¹⁹

With the continuous enrichment of educational informatization means, the use of online teaching platform to carry out personal self-study has become the first choice for many medical workers.²⁰ Chinese medical workers are affected by occupational environment, stress, responsibility and other social factors,¹¹ with a full load or even overload work, resulting in difficulty for full-time study. The results of our survey showed that the favorite training form and way for obtaining resources among doctors with different working years was online, and only 4.70% chose the form of on-site conference presentations. The training form of scenario simulation is superior to the traditional lecture and PBL model. With the development of the Internet, the new education technology represented by new media video micro-courses makes high-quality CME resources shared, with low-cost, high-quality and large-scale training characteristics. The new information education technology, with its quick transmission speed, diverse media forms and rich sharing channels, has the great advantage of breaking through the limitation of space and time and meeting the learning needs of learners at any time, anywhere and at any rhythm.²¹ Moreover, compared with conventional face-to-face teaching, observation, special seminar and other continuing education methods, online learning also has obvious advantages in the training scale and training cost of learners. Admittedly, online learning also has its drawbacks to overcome, such as reduced communication efficiency, no teacher presence, learner isolation, and lack of peer support and competition.¹² However, the advantages of online education are higher than the negative effects brought about by these adverse factors. Online education is easier to access and more efficient in providing doctors with richer teaching resources and has a good potential in improving the educational gap in countries with scarce medical resources.¹³

Conclusion

Our survey results showed that doctors with different working years had different needs for CME content, but educational needs in gynecological endocrine diseases were preferred by doctors with different working years. Online teaching is the most popular form of education. In short, CME subjects include medical technicians at all levels, and its

educational content should also be based on the actual needs of the educated subjects, focusing on pertinence, practicability and advancement.

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