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Attitude and knowledge for menopause management among health professionals in mainland China

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ABSTRACT

Objective: This study aims to understand the attitude of health-care professionals (HPs) in mainland China toward menopause management (MM) as well as the knowledge they have received regarding MM during training.

Methods: An anonymous survey recruited 3709 medical workers nationwide (including physicians, orthopedists, obstetricians and gynecologists, and general practitioners) through online surveys and on-site interviews at professional meetings.

Results: Of the 3709 questionnaires completed, 3426 questionnaires met the inclusion criteria. Of the participants, 1532 HPs had not received menopause management training (MMT) in nearly 1 year. Among the residents and physician assistants, 103 reported they were not familiar with MM. Satisfyingly, 98.3% of HPs considered it very important or essential to accept MM. Although most interviewees replied some correct menopausal knowledge, nearly half of them could not correctly identify the contraindications for menopause hormone therapy (MHT). Additionally, 73.1% of HPs would advise patients with premature ovarian insufficiency to receive hormone replacement therapy at least until the average age of menopause.

Conclusion: This survey indicated that HPs have some knowledge regarding MM, but a gap remains to master the basic theory of MHT. In order to manage the growing menopausal population in China, creating more in-depth educational MMT programs for HPs is necessary.

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KEYWORDS

Menopause management; menopause hormone therapy; attitude; knowledge

Introduction

According to the 2010 population census, China has 160 million women over 50 years old, with 110 million women aged between 40 and 49 years old (<http://www.stats.gov.cn>). The average life expectancy of Chinese people in 2018 is 77 years; for women in Beijing, life expectancy is around 84.63 years. The general natural menopausal age of Chinese women is around 49 years old, however (<http://www.nhc.gov.cn>)¹. The defining feature of menopause is estrogen deficiency. Long-term lack of estrogen leads to increased risk of metabolic diseases for the elderly, which poses great threats to the health and life quality of menopausal women. Conjugated estrogen was officially put into clinical use in 1942; at one point, the utilization rate of menopause hormone therapy (MHT) among European and American women was as high as 40%². However, under the influence of the Women's Health Initiative study³ and the Million Women Study⁴, the attitudes of doctors and the general public toward MHT have become more negative^{5,6}. The fundamental reason for this decline was media publicity and doctors' advice; the utilization rate of MHT in Europe and the USA decreased to approximately 10%⁷⁻⁹. The initiation of menopause

management (MM) in China lagged behind somewhat. Although the impact of these two studies has been avoided to a certain degree, the utilization rate of MHT in Chinese menopausal women was only 1–3% due to the traditional fear of hormone usage^{10,11}.

In the past 10 years, studies on MHT have reached a global consensus; the belief is that MHT can effectively relieve menopause-related symptoms and alleviate genitourinary syndrome of menopause. Progesterone should be reasonably recommended for patients with a uterus. Starting MHT as soon as possible after menopause could also prevent menopause-related osteoporosis and cardiovascular diseases; these benefits have increased doctors' confidence in MHT^{12,13}. A survey from Latin America indicated that most participating gynecologists would consider MHT for themselves or their spouses¹⁴.

Since the establishment of the Chinese Menopause Society in 2001, its goals have included the training of specialists as well as popularization and promotion of MHT among the general public and health-care professionals (HPs), setting up over 200 menopausal clinics on the mainland. In recent decades, there have been only a few studies

on HPs' attitudes toward MM. For two surveys among HPs, one included only obstetricians and gynecologists (OB/GYN) who participated in the national professional conference¹⁵, and the other confined its research to the city of Jiaxing, Zhejiang Province¹⁶. When faced with managing the health care of such a large number of menopausal women, it is not sufficient to rely on some specialist HPs to popularize MM. For example, systemic muscle and joint pain are the most common menopausal symptoms in Chinese women, but few people realize the correlation between them and menopause. The knowledge regarding climacteric symptoms from orthopedists plays a vital role in the promotion of MM. Physicians and general practitioners also have more opportunities to interact with these women when managing chronic diseases¹⁷. Therefore, there is an urgent need for more HPs to dedicate themselves to promoting MM in China.

This cross-sectional study recruited participants from various provinces and different levels of hospitals, including physicians, orthopedists, OB/GYN, and general practitioners, to examine their attitude toward MM, their level of training, and their basic knowledge regarding menopause. The goal was to explore a more reasonable training plan for HPs in the future.

Methods

Study design

Participants in this study were from the obstetrics and gynecology department of tertiary, secondary, and community hospitals (except gynecological endocrinology), internal medicine (mainly endocrinology, cardiology, general internal medicine), general practice, and orthopedics. In total, 3708 questionnaires were received between September 2019 and January 2020. The online survey was mainly conducted for OB/GYN, general practitioners, and physicians. There were seven major regions in mainland China included in this research, consisting of east China (Shandong, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shanghai), north China (Beijing, Tianjin, Hebei, Inner Mongolia, Shanxi), northeast China (Liaoning, Jilin, Heilongjiang), central China (Henan, Hubei, Hunan), south China (Guangdong, Guangxi, Hainan), southwest China (Chongqing, Sichuan, Guizhou, Yunnan, Tibet), and northwest China (Shaanxi, Gansu, Tibet, Qinghai, Ningxia, Xinjiang). Orthopedists who attended the 14th Annual Congress of Chinese Orthopedic Association in 2019 were also invited to participate in the survey.

The research scheme of this study has been reviewed and approved by the Ethics Committee of Peking Union Medical College Hospital (ethics, S-K916). The completion and submission of the questionnaire indicated that the participants agreed to participate in this study, and they could withdraw from the study at any time and for any reason.

The data were collected through online software (<https://www.wjx.cn/>), and the questionnaire could be submitted only if all questions were completed. The questionnaire had 20 questions in total, which were divided into four parts: the demographic characteristics of the participants; the participants' understanding of MHT and their training; the

participants' attitude toward themselves or their spouses, family members, and patients when using MHT; and the participants' knowledge about MHT. The questionnaire was based on the current experts' consensus and guidelines on MM, adapted after experts reviewed and assessed the structure and contents of the questionnaire for content validity and to optimize the evaluation of the interviewees' competencies and knowledge. Once the instrument was developed, 30 participants were invited to repeat the questionnaire more than 2 weeks apart for reliability analysis.

Statistical analysis

Data were expressed as number (percentage) for statistical description. Comparisons among different groups were performed by χ^2 analysis or the Monte Carlo method for the exact test. The pairwise comparisons were carried out by the Bonferroni test. For multi-choice items, multiple-response analysis was adopted for the variables. $p < 0.05$ was regarded as a statistical difference. $p < 0.01$ was defined as a statistically significant difference.

Results

Among the 3709 questionnaires received, 3426 met the analysis conditions after evaluation. **Table 1** presents a breakdown of responses by provider specialty, geographical regions, and other demographic information. The gender distribution between orthopedic participants (more than 90% male) and internal medicine, OB/GYN, and general practitioners (primarily female) was in line with the actual clinical situation. When it came to age composition, medical workers aged 41–45 years (20.1%) and over 45 years (37.4%) were more active in participating in these menopause-related questionnaires. Among all of the participants, there were 187 assistant physicians (5.5%), 481 residents (14.0%), 1152 attending physicians (33.6%), 1107 associate chief physicians (32.3%), and 499 chief physicians (14.6%). Among them, 1629 (47.5%) were from tertiary hospitals, 1348 (39.3%) from secondary hospitals, and the rest (13.1%) from community hospitals.

When HPs reported how they learned about MM, 1959 OB/GYN (76.5%) stated that their learning came from attending professional lectures, which was significantly different from others ($p < 0.01$). Nearly half of physicians, orthopedists, and general practitioners were introduced initially via professional lectures or peer introductions. With regard to the frequency of participating in menopause management training (MMT) in the past 1 year, up to 1532 HPs (44.7%) reported that they had not participated in the related training during this time frame, and OB/GYN exhibited more opportunities to participate in two or more training sessions than others ($p < 0.01$). However, very few HPs had ever received specialist training in menopausal clinics for more than 3 months, and there was no statistical difference among the four specialties as presented in **Table 2**. Based on the analysis of MMT accepted by HPs stratified by the professional title, our results showed that most of the associate chief physicians and chief physicians tried to learn

Table 1. Baseline characteristics of interviewed health professionals.

Characteristic	Specialty					p-Value
	Physicians (n = 361)	Orthopedists (n = 290)	OB/GYN (n = 2561)	General practitioners (n = 214)	Total (n = 3426)	
Gender						<0.01
Male	81 (22.4)	266 (91.7)	121 (4.7)	41 (19.2)	509 (14.9)	
Female	280 (77.6)	24 (8.3)	2440 (95.3)	173 (80.8)	2917 (85.1)	
Age (years)						<0.01
21–25	10 (2.8)	9 (3.1)	38 (1.5)	12 (5.6)	69 (2.0)	
26–30	47 (13.0)	52 (17.9)	163 (6.4)	17 (7.9)	279 (8.1)	
31–35	54 (15.0)	65 (22.4)	343 (13.4)	35 (16.4)	497 (14.5)	
36–40	59 (16.3)	65 (22.4)	453 (17.7)	37 (17.3)	614 (17.9)	
41–45	79 (21.9)	49 (16.9)	525 (20.5)	34 (15.9)	687 (20.1)	
Above 45	112 (31.0)	50 (17.2)	1039 (40.6)	79 (36.9)	1280 (37.4)	
Region						<0.01
East China	49 (13.6)	78 (26.9)	476 (18.6)	26 (12.1)	629 (18.4)	
North China	94 (26.0)	45 (15.5)	350 (13.7)	60 (28.0)	549 (16.0)	
Northeast China	86 (23.8)	31 (10.7)	306 (11.9)	47 (22.0)	470 (13.7)	
Central China	56 (15.5)	43 (14.8)	365 (14.3)	23 (10.7)	487 (14.2)	
South China	20 (5.5)	48 (16.6)	272 (10.6)	23 (10.7)	363 (10.6)	
Southwest China	32 (8.9)	23 (7.9)	375 (14.6)	25 (11.7)	455 (13.3)	
Northeast China	24 (6.6)	22 (7.6)	417 (16.3)	10 (4.7)	473 (13.8)	
Professional title						<0.01
Resident	68 (18.8)	62 (21.4)	313 (12.2)	38 (17.8)	481 (14.0)	
Attending physician	112 (31.0)	100 (34.5)	857 (33.5)	83 (38.8)	1152 (33.6)	
Associate senior doctor	96 (26.6)	78 (26.9)	884 (34.5)	49 (22.9)	1107 (32.3)	
Chief physician	52 (14.4)	42 (14.5)	387 (15.1)	18 (8.4)	499 (14.6)	
Physician assistants	33 (9.1)	8 (2.8)	120 (4.7)	26 (12.1)	187 (5.5)	
Hospital level						<0.01
Tertiary	213 (59.0)	216 (74.5)	1136 (44.4)	64 (29.9)	1629 (47.5)	
Second-class	103 (28.5)	68 (23.4)	1127 (44.0)	50 (23.4)	1348 (39.3)	
Community hospitals	45 (12.5)	6 (2.1)	298 (11.6)	100 (46.7)	449 (13.1)	

Data expressed as number (percentage). χ^2 analysis performed for comparisons among different specialties. OB/GYN, obstetricians and gynecologists.

Table 2. Self-reported situation about menopausal management.

Variable	Specialty					p-Value
	Physicians (n = 361)	Orthopedists (n = 290)	OB/GYN (n = 2561)	General practitioners (n = 214)	Total (n = 3426)	
Approaches to know about MM						<0.01
Professional lectures	117 (32.4)	95 (32.8)	1959 (76.5)	89 (41.6)	2260 (66.0)	
Internet or TV media	40 (11.1)	27 (9.3)	118 (4.6)	19 (8.9)	204 (6.0)	
WeChat or microblog	37 (10.2)	36 (12.4)	177 (6.9)	25 (11.7)	275 (8.0)	
Specialized visitor invitation	77 (21.3)	61 (21.0)	180 (7.0)	30 (14.0)	348 (10.2)	
Hospital bulletin board	17 (4.7)	15 (5.2)	38 (1.5)	10 (4.7)	80 (2.3)	
Not clear	73 (20.2)	56 (19.3)	89 (3.5)	41 (19.2)	259 (7.6)	
Number of MMT received in recent 1 year						<0.01
None	266 (73.7)	213 (73.4)	909 (35.5)	144 (67.3)	1532 (44.7)	
Once	57 (15.8)	46 (15.9)	740 (28.9)	45 (21.0)	888 (25.9)	
Twice	16 (4.4)	16 (5.5)	401 (15.7)	10 (4.7)	443 (12.9)	
More than twice	13 (3.6)	12 (4.1)	457 (17.8)	10 (4.7)	492 (14.4)	
Specialist training for at least 3 months in menopause clinic	9 (2.5)	3 (1.0)	54 (2.1)	5 (2.3)	71 (2.1)	

Data expressed as number (percentage). χ^2 analysis used for comparisons, grouped by specialty. The pairwise comparisons were carried out by Bonferroni test. MM, management of menopause; MMT, menopause management training; OB/GYN, obstetricians and gynecologists.

about it mainly through professional meetings while half of the residents and assistant physicians responded the exact contrary. Peer introduction was another alternative choice for some residents and assistant physicians to learn about MM. Apart from this, it was a remarkable fact that quite a few residents and assistant doctors claimed that they did not know about MM. Through investigating the frequency of training for doctors at all levels in the past year, it was also evident that the higher the professional title, the more opportunities to receive training. One hundred and twenty-one chief physicians (24.2%) had received the training more than twice in the past year, with a statistical difference compared with others ($p < 0.01$). Over half of the residents

and assistant physicians indicated that they had not received MMT (Supplementary Table 15) in nearly 1 year. Almost all of the respondents said they wanted to learn more about MM in different ways, and only 23 HPs expressed they did not want to know more. Additionally, it was clear that the professional meeting was the first choice for HPs to acquire knowledge regarding MM. Physicians and general practitioners also preferred on-site medical popular science education and clinical practice. Orthopedists, meanwhile, preferred the social media platforms of WeChat and Weibo; OB/GYN were more willing to choose clinical practice when compared with physicians and orthopedists ($p < 0.01$) (Figure 1).

Regarding the attitude of HPs toward MM, 81.1% of OB/GYN considered MM very important, which was different from the other three specialties. Altogether, 3367 HPs (98.3%) viewed MM as very important or essential (Figure 2(A)). In this study, we also explored whether there was a difference in the decisions made regarding MM by HPs in the

face of various identities: themselves, their spouses, family members, or patients. Of the 2917 female HPs who participated in the questionnaire, 90.9% of female OB/GYN were more willing to accept MM ($p < 0.05$) for themselves, compared with 87.8% of female HPs in general (Figure 2(B)). When asked how strongly all respondents would encourage family members to use MHT for MM, around one-third of them stated they would strongly recommended family members to accept MHT. Among the 290 orthopedists, 40.0% showed a more positive attitude ($p < 0.05$). However, there was no statistical difference in the strong recommendation of MHT among OB/GYN, physicians, and general practitioners. Half of the HPs indicated that family members ought to be advised to accept MHT (Figure 2(C)) during clinical practice. Further, 65.7% of HPs would strongly recommend MHT and transfer consultation to menopausal clinics when patients were treated for menopausal symptoms. As expected, most OB/GYN exhibited a more positive attitude toward recommending MHT and referral than physicians (53.5%), orthopedic surgeons (52.4%), and general practitioners (50.0%) ($p < 0.05$) (Figure 2(D)).

In this study, a series of questions were designed to study HPs' understanding of the basic knowledge of MHT. Among them, 51.5% of HPs could correctly identify natural menopause as presented in Table 3. Through the stratified analysis

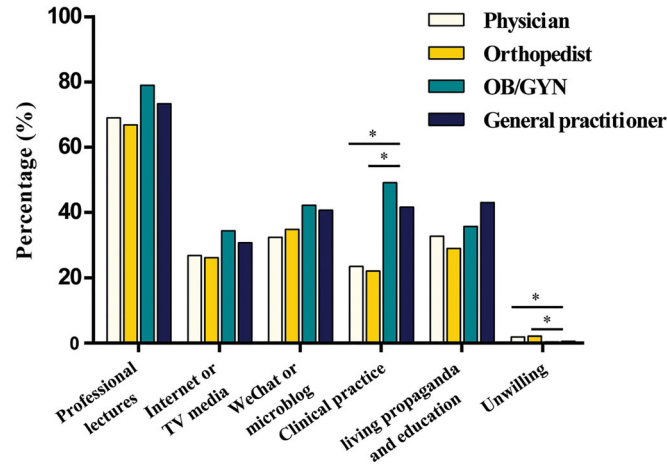


Figure 1. Recommendation for menopause management training. The preferred ways for health professionals from different specialties when considering menopause management training. * $p < 0.05$. OB/GYN, obstetricians and gynecologists.

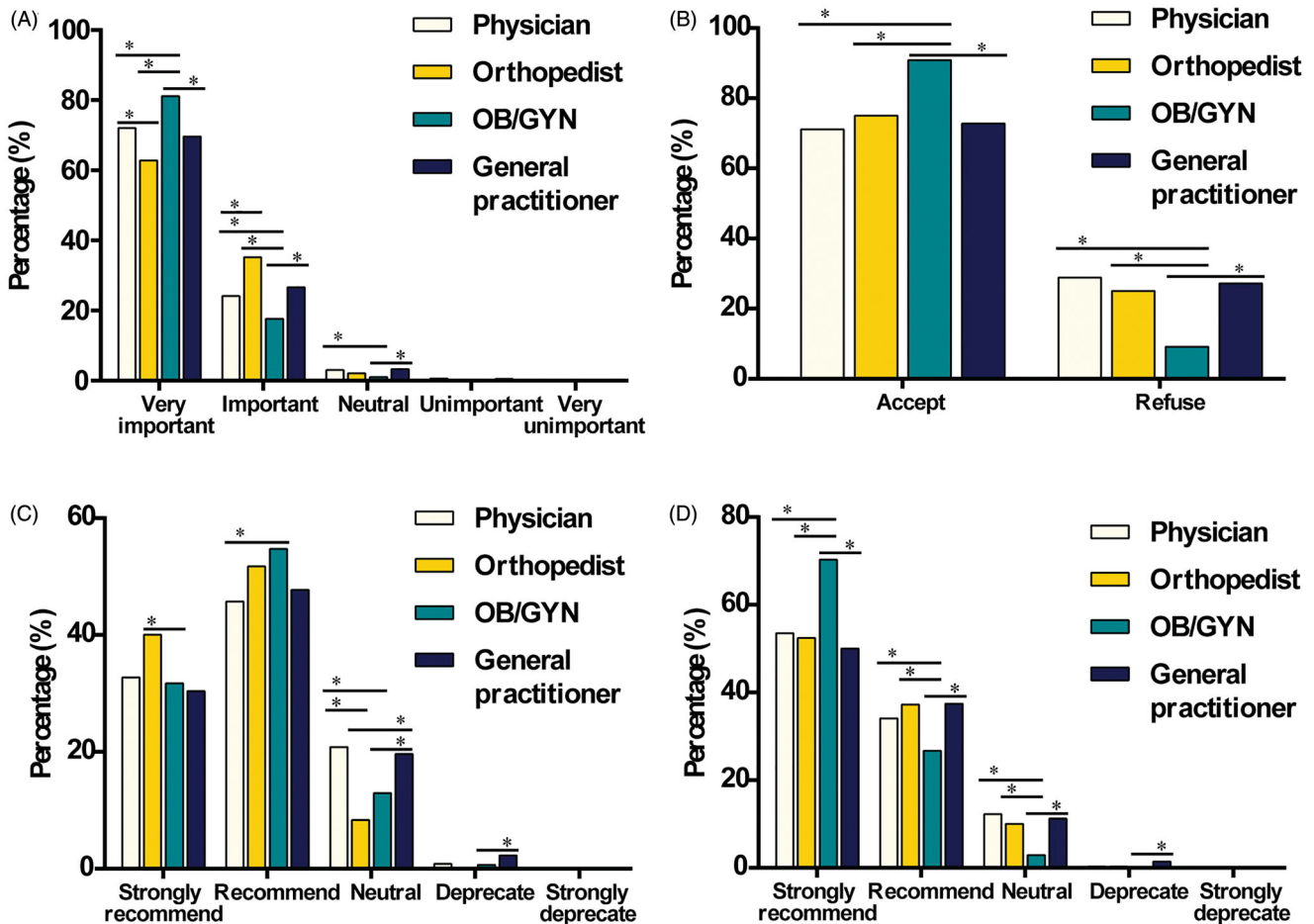


Figure 2. Attitude of medical workers toward menopause management (MM) or menopause hormone therapy (MHT). (A) Attitude toward MM, grouped by specialty. (B) Personal acceptance for MHT for themselves. (C) Willingness to recommend MHT for their family. (D) Willingness to recommend MHT or transfer treatment to climacteric clinics for markedly symptomatic patients. * $p < 0.05$. OB/GYN, obstetricians and gynecologists.

Table 3. Knowledge about the theories of menopause management, grouped by specialty.

Variable	Specialty				Total (n = 3426)	p-Value
	Physicians (n = 361)	Orthopedists (n = 290)	OB/GYN (n = 2561)	General practitioners (n = 214)		
Diagnosis of natural menopause^b						
Amenorrhea over 1 year, with normal follicle depletion after 40 years old	160 (44.3)	140 (48.3)	1360 (53.1)	105 (49.1)	1765 (51.5)	<0.01
FSH increased	5 (1.4)	3 (1.0)	66 (2.6)	0 (0.0)	74 (2.2)	
Vasomotor symptoms (hot flashes/night sweats)	18 (5.0)	7 (2.4)	53 (2.1)	2 (0.9)	80 (2.3)	
Ovariectomy or uterectomy due to diseases	1 (0.3)	4 (1.4)	7 (0.3)	0 (0.0)	12 (0.4)	
Above all	124 (34.3)	100 (34.5)	1042 (40.7)	90 (42.1)	1356 (39.6)	
Not clear	53 (14.7)	36 (12.4)	33 (1.3)	17 (7.9)	139 (4.1)	
Symptoms of menopause^a						
Vasomotor symptoms (hot flashes or night sweats)	337 (93.4)	227 (78.3)	2529 (98.8)	202 (94.4)	3295 (96.2)	<0.01
Fever	166 (46.0)	124 (42.8)	1184 (46.2)	91 (42.5)	1565 (45.7)	
Vaginal dryness	308 (85.3)	196 (67.6)	2511 (98.1)	194 (90.7)	3209 (93.7)	
Fatigue	270 (74.8)	189 (65.2)	1856 (72.5)	150 (70.1)	2465 (72.0)	
Hypomnesia	288 (79.8)	209 (72.1)	2318 (90.5)	165 (77.1)	2980 (87.0)	
Sleep disturbance	307 (85.0)	203 (70.0)	2427 (94.8)	173 (80.8)	3110 (90.8)	
Alzheimer disease	105 (29.1)	77 (26.6)	1362 (53.2)	65 (30.4)	1609 (47.0)	
Joint pain	199 (55.1)	174 (60.0)	2056 (80.3)	137 (64.0)	2566 (74.9)	
Weight loss	78 (21.6)	66 (22.8)	391 (15.3)	38 (17.8)	573 (16.7)	
Optimum starting time for MHT^a						
Early menopause	191 (52.9)	167 (57.6)	1812 (70.8)	121 (56.5)	2291 (66.9)	<0.01
Menopause within 5 years	73 (20.2)	59 (20.3)	591 (23.1)	43 (20.1)	766 (22.4)	
Menopause within 15 years	2 (0.6)	1 (0.3)	25 (1.0)	1 (0.5)	29 (0.8)	
Any time	6 (1.7)	9 (3.1)	65 (2.5)	9 (4.2)	89 (2.6)	
Not clear	89 (24.7)	54 (18.6)	68 (2.7)	40 (18.7)	251 (7.3)	
MHT indications^a						
Menopausal symptoms	28 (7.8)	38 (13.1)	125 (4.9)	24 (11.2)	215 (6.3)	<0.01
Urogenital atrophy	5 (1.4)	6 (2.1)	18 (0.7)	3 (1.4)	32 (0.9)	
Prevention of osteoporosis or fracture	16 (4.4)	47 (16.2)	29 (1.1)	8 (3.7)	100 (2.9)	
Above all	259 (71.7)	170 (58.6)	2359 (92.1)	160 (74.8)	2948 (86.0)	
Not clear	53 (14.7)	29 (10.0)	30 (1.2)	19 (8.9)	131 (3.8)	
MHT contraindications^a						
Severe hypertension	27 (7.5)	24 (8.3)	86 (3.4)	9 (4.2)	146 (4.3)	<0.01
Breast cancer	158 (43.8)	92 (31.7)	1402 (54.7)	104 (48.6)	1756 (51.3)	
Fibroid uterus	39 (10.8)	29 (10.0)	43 (1.7)	16 (7.5)	127 (3.7)	
Systemic lupus erythematosus	19 (5.3)	16 (5.5)	51 (2.0)	13 (6.1)	99 (2.9)	
Tendency of thrombus	37 (10.2)	25 (8.6)	908 (35.5)	31 (14.5)	1001 (29.2)	
Not clear	81 (22.4)	104 (35.9)	71 (2.8)	41 (19.2)	297 (8.7)	
Recommendation for severe climacteric symptoms^b						
MHT	260 (72.0)	209 (72.1)	2350 (91.8)	168 (78.5)	2987 (87.2)	<0.01
Black sesame seeds	1 (0.3)	2 (0.7)	57 (2.2)	0 (0.0)	60 (1.8)	
Antianxiety agents or sedatives	35 (9.7)	28 (9.7)	53 (2.1)	3 (1.4)	119 (3.5)	
Yoga or Tai Chi	22 (6.1)	13 (4.5)	32 (1.2)	11 (5.1)	78 (2.3)	
Acupuncture	6 (1.7)	10 (3.4)	10 (0.4)	10 (4.7)	36 (1.1)	
Diet therapy	10 (2.8)	11 (3.8)	29 (1.1)	5 (2.3)	55 (1.6)	
Let it be	27 (7.5)	17 (5.9)	30 (1.2)	17 (7.9)	91 (2.7)	
Recommendation of HRT for premature ovarian insufficiency^a						
For 3–5 years	93 (25.8)	86 (29.7)	345 (13.5)	55 (25.7)	579 (16.9)	<0.01
At least until the mean age of menopause	198 (54.8)	129 (44.5)	2060 (80.4)	118 (55.1)	2505 (73.1)	
Until remission of symptoms	27 (7.5)	31 (10.7)	86 (3.4)	13 (6.1)	157 (4.6)	
Let it be	28 (7.8)	28 (9.7)	38 (1.5)	16 (7.5)	110 (3.2)	
Deprecated	15 (4.2)	16 (5.5)	32 (1.2)	12 (5.6)	75 (2.2)	

Data expressed as number (percentage). Pairwise comparisons carried out by Bonferroni test. FSH, follicle stimulating hormone; HRT: hormone replacement therapy; MHT, menopause hormone therapy; OB/GYN, obstetricians and gynecologists.

^a χ^2 analysis performed for comparisons among different specialties.

^bMonte Carlo method for exact test used for comparisons, grouped by specialty.

of tertiary hospitals and non-tertiary hospitals, it appeared that higher hospital levels had a higher probability to make the correct diagnosis for natural menopause (odds ratio 0.83, 95% confidence interval 0.73–0.95, $p < 0.01$) (Figure 3). For non-gynecological endocrinologists, it is crucial to correctly identify menopause-related symptoms in clinical practice, but no more than 10% of HPs could fully determine symptoms that might be caused by menopause. Nearly half of HPs chose fever and Alzheimer disease and 16.7% of HPs chose weight loss as potential systems. Worse, 53.2% of OB/GYN

regarded Alzheimer disease as a possible symptom of menopause. Starting MHT as early as possible after menopause could prevent osteoporosis and metabolic diseases in older people. Of those who participated, 2291 HPs (66.9%) could confirm the optimum starting time for MHT; OB/GYN accounted for 70.8% of the correct responses. Furthermore, 86.0% of HPs could correctly judge the indications that it would be appropriate to start MHT; OB/GYN (92.1%) offered the correct answer more often than other specialties. The topic of whether MHT would increase the risk of breast

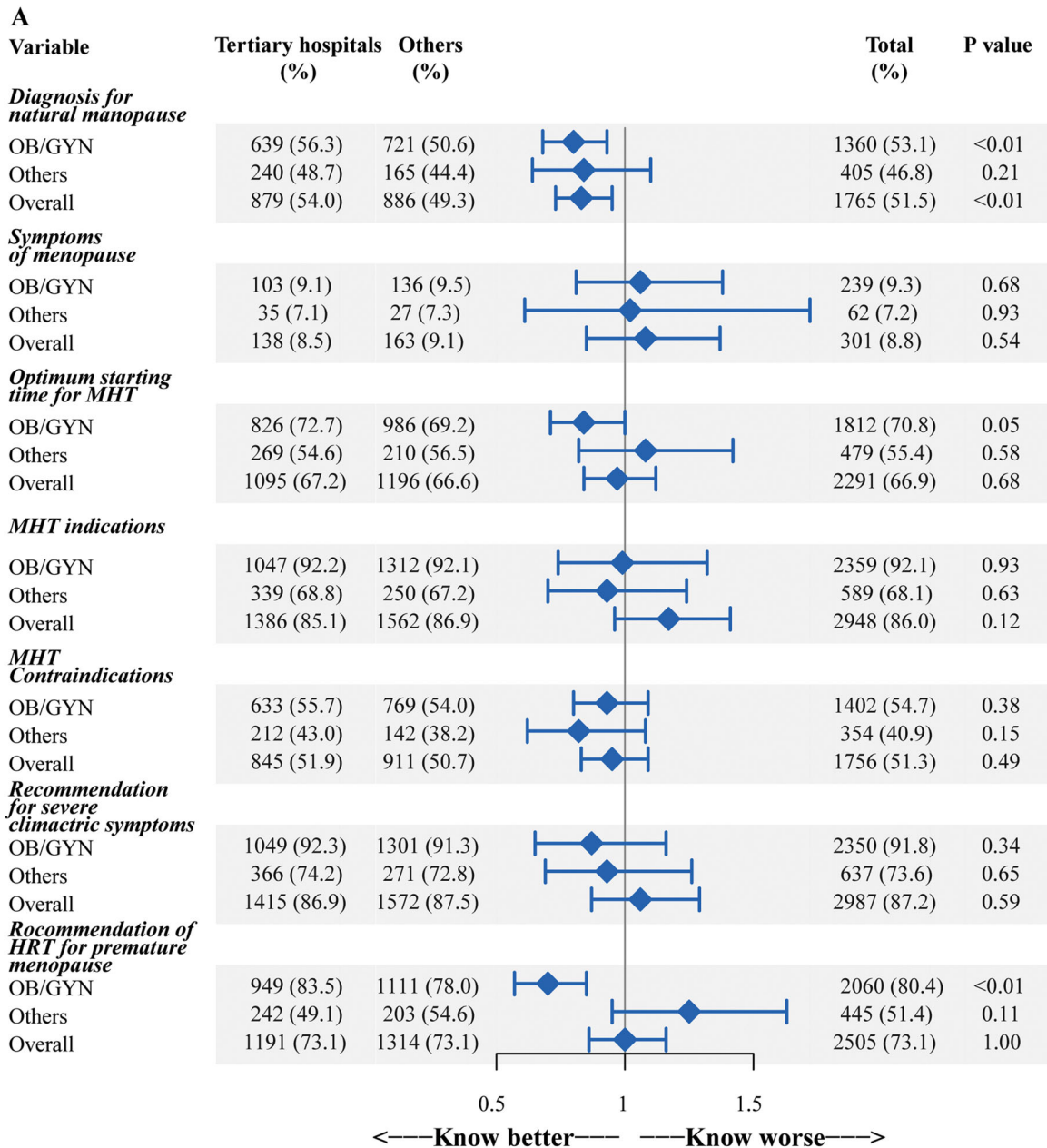


Figure 3. Mastery of the basic theory of menopause management (MM) or menopause hormone therapy (MHT). (A) Acquisition of knowledge of MM or MHT among health professionals from different specialties, grouped by the hospital level they worked in. * $p < 0.05$. OB/GYN, obstetricians and gynecologists.

cancer has been debated for 2 years, but a history of breast cancer has long since been considered a contraindication for MHT. Only 51.3% of HPs correctly selected MHT contraindications among the interference options. Satisfyingly, 87.2% of HPs could accurately recognize that MHT was the appropriate treatment for women with obvious menopausal symptoms and 2505 HPs said they would advise premature ovarian insufficiency women to try HRT at least to the average menopausal age without contraindications, including 80.4% of OB/GYN (Table 3). Finally, our analysis also revealed the fact that the higher the level of the hospital where OB/GYN worked, the more likely it was that they could realize the benefits of early interventions for premature ovarian insufficiency (odds ratio 0.70, 95% confidence interval 0.57–0.85, $p < 0.01$) (Figure 3).

Discussion

Menopausal transition and postmenopause have become the longest stages in women's lives. MM is an integrated management involving comprehensive lifestyle guidance, health management, and drug management. However, in the face of the enormous population, more medical workers should engage in more interdisciplinary academic interactions.

This is the first study in mainland China to compare the knowledge and attitude of HPs with different specialties on MM and MHT. More evidence has indicated that women in the early stage of menopause would benefit from the use of MHT^{12,13}. Menopausal organizations in China have made unremitting efforts in the past decades to push forward re-education or training activities for HPs^{18,19}. This study

demonstrated that 98.3% of HPs, particularly 98.8% of OB/GYN, thought highly of MM. This is in agreement with the results of another study where 96.2% of participants considering MM extremely important¹⁵. Based on these results, not only has the awareness of OB/GYN been strengthened, but the emphasis of MM among medical workers has also increased. In a recent study with 745 Australian HPs, 91% expressed that they would provide MHT to women with menopausal symptoms²⁰. Compared with this, our research demonstrated that more HPs were willing to recommend MHT to their patients.

Most HPs understood the basic knowledge of MHT, especially for the management of premature ovarian insufficiency patients. The majority of HPs, including 80.4% of OB/GYN, would properly advise hormonal replacement therapy until the average age of natural menopause. But at the same time, some obvious knowledge gaps were uncovered, such as the identification of menopause-related symptoms. Most Chinese women have symptoms of systemic muscle and joint pain during the menopausal transition and postmenopausal periods^{11,21}. Of the orthopedists in this study, 60% were aware of the potential relationship between joint pain and menopause. It is therefore particularly necessary that efforts to promote MM should be supported by orthopedists. Also, nearly half of the participants were not able to correctly diagnose natural menopause, and only half of the HPs knew that breast cancer was a contraindication for MHT even though the current evidence and guidelines have pointed it out. Luckily, this knowledge gap can be solved through education and training. More importantly, among the participants in this survey, 44.7% of HPs and about one-third of OB/GYN showed that they had not received relevant training in nearly 1 year (with OB/GYN having more opportunities to be trained about MM). The online surveys of 510 OB/GYN in 2013²² and 183 students from American residency programs in 2019²³ proved that these HPs knew little about MM and MHT. According to our study, 58.5% of residents and assistant physicians reported that they had no access to related training in nearly a year; many even reported that they had never heard of MM. This implied that creating courses regarding MM during residency training should be a priority in women's health projects²⁴. Also, when comparing OB/GYN with other professionals in hierarchical analysis, it could be concluded that even if they were engaged in various majors or different levels of hospitals, there was no statistical difference in determining the menopausal symptoms, optimum starting time of MHT, or contraindications and indications knowledge, which also provided some evidence for how to arrange continuing education courses for HPs.

In the present study, most HPs were significantly interested in receiving MMT. They often preferred professional meetings, which was similar to conclusions from other studies. In addition to professional meetings, physicians and general practitioners were also in favor of on-site medical popular science, and felt that it was more suitable to learn MM-related knowledge with the shallow to deep theoretical learning process and timely interaction with training teachers. Live online learning has been increasingly popular

because it provides a convenient and flexible form, breaks regional limitations, and gives more balanced access to medical and educational resources. General practitioners and physicians agreed on their choices of on-site medical popular science education and clinical practice; their reasons for selecting the latter were similar to those of the OB/GYN. OB/GYN have more access to MM and need the training method of combining theory with practice more than others. General practitioners and physicians are crucial for the management of chronic diseases, and they have more opportunity to take care of menopausal women^{25,26}. The development of a personalized MM program for women in the initial stage of menopause is an important beginning for the prevention of chronic diseases. Considering our current medical situation, it would be beneficial to create more MHT courses during resident and general practitioner training, and to create more opportunities for interdisciplinary academic exchanges.

Conclusions

The attitude of HPs in mainland China toward MM has been improved to varying degrees, but a thought-provoking gap in mastering the basic theory of MHT remains. When confronted with managing the huge menopausal population, more specialists are needed. It is also worth increasing interdisciplinary communication opportunities so that medical practitioners will have more chances to obtain general education about MM.

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