

Knowledge, attitudes and practice regarding copper intrauterine contraceptive devices among doctors in Malaysia

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ABSTRACT

Background and objective Intrauterine contraceptive devices (IUDs) are an important method to reduce unmet need for family planning and for prevention of unintended pregnancy. However, IUD use in Malaysia is still low. Doctors play a major role in influencing IUD uptake among women. This study was designed to evaluate doctors' knowledge, attitudes and perceptions towards IUDs and factors associated with their current practice.

Methods A questionnaire was mailed to public and private contraceptive providers who practise in Kuala Lumpur, Malaysia.

Results A total of 400 doctors were invited and 240 (60%) of them responded to the survey. Of the respondents, 161 (65.9%) were from the public or government sector and 89 (34.1%) were from the private sector. The knowledge score of doctors was classed as 'average', and correlated well with their previous training level, working position, number of patients seen in a week and number of contraceptive methods available in their facilities. The age, gender, working duration, availability of IUDs in the premises and number of IUD insertions in a month were not statistically associated with the providers' knowledge. The use of IUDs was low, especially among private doctors, and was significantly related to their knowledge of the method. Knowledge scores, perception and practice were significantly lower in the private sector.

INTRODUCTION

Unmet need for family planning is defined as the percentage of women who want to stop or delay childbearing but are not using contraception. Globally, about 12% of married or in-union women are estimated to have an unmet need for family

Key messages

- ▶ In the Kuala Lumpur study cohort, only 45% of private doctors and 63% of government doctors believed that the intrauterine device (IUD) is an effective contraceptive method.
- ▶ Almost 30% of the doctors were not aware that copper IUDs can be used as emergency contraception.
- ▶ Government doctors had a significantly higher knowledge score than those in the private sector.
- ▶ Only a minority of doctors (6.7%) did not recommend IUDs to women.

planning.¹ The unmet need was reported to be 22% in developing countries,¹ but in Malaysia unmet need was reported to be as high as 25%.² When use of contraception is low, unintended pregnancy rates are shown to be high, increasing the risk of maternal morbidity and mortality.³

Research has demonstrated that long-acting reversible contraception methods such as copper intrauterine devices (IUDs) are a cost-effective and sustainable way of reducing unmet need and unplanned pregnancy in developed or developing countries.³ The IUD is an effective method of non-hormonal contraception and is reversible, unlike female sterilisation.⁴ Around the world, rates of IUD usage are high in countries such as Uzbekistan (50%), Vietnam (31%), China (41%), Egypt (36%) and Finland (23%),¹ but in Malaysia the rate of IUD usage was reported as only 5.4% in the year 2015.¹ In Malaysia, family planning services are available from doctors in either public or private sectors. The the



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most common contraceptive method in Peninsular Malaysia is hormonal contraceptive pills (contraceptive prevalence rate of 14.0) as compared with IUDs (contraceptive prevalence rate of 4.5).⁵

Information that women receive from healthcare providers significantly influences their contraception choices. Van Zijl *et al*⁶ demonstrated that there was a link between healthcare providers' knowledge and women's IUD uptake. They found that low usage of IUDs was related to lack of knowledge about this method among doctors.⁶ Hence, IUDs were not frequently discussed with women or suggested as a reliable contraceptive option. Other studies also suggested that provider knowledge was deficient in some aspects of contraception. For example, as reported by Harper *et al*, fewer than half of providers (nurses or physician assistants) in that study were aware of evidence-based guidelines for eligibility for IUDs.⁷

This study was designed to evaluate the knowledge as well as the attitudes and perception towards IUDs among doctors in Kuala Lumpur, the capital city of Malaysia, where access to health facilities is good. We also aimed to determine the practice pattern and identify factors associated with the practice of IUD use.

METHODS

In this cross-sectional questionnaire study, 400 doctors from government and private sectors were invited using a randomisation method. A list of doctors practising in Kuala Lumpur was initially generated, to include general practitioners, doctors in primary health clinics, and obstetrics and gynaecology specialists. Doctors were chosen randomly from the list by computer with equal representation from both the government and private sectors. A telephone call was made to acquire verbal consent before the questionnaire was mailed to the selected doctors. Informed consent was implied when the doctors completed the questionnaire and returned it. A second questionnaire was mailed to non-respondents after approximately 3 weeks. No incentive was provided.

The questionnaire was developed and validated based on literature research and personal discussion with a previous researcher.⁸ The overall reliability score using Cronbach's alpha was 0.769. The questionnaire included 37 questions in four sections: (a) knowledge, (b) practice, (c) attitude and (d) perception toward personal efficacy in providing an IUD service.

Knowledge was assessed by eight questions: three multiple-choice questions (total score 3) and 17 true-false questions (total score 17), making a total score of 20. A score of 15 and above was considered 'good', 10–14 considered 'average' while 9 and below was categorised as 'poor'. Practice was assessed with a question about whether the individual had ever inserted an IUD during their career. With regard to current practice, the provider was asked to indicate whether they 'recommend (the IUD) to no one', 'recommend to

selected clients and refer to other people' or 'recommend and insert it themselves'. Attitude/perception was assessed by closed-ended questions towards the preventing and promoting factors that may influence the decision to recommend the IUD. Providers were asked about their own perception of self-efficacy in providing an IUD service using a Likert scale. A total score of more than 15 was classified as a positive perception towards efficacy. All data were collected and analysed using SPSS Version 22.0 (Armonk, NY: IBM Corp.) This study was approved by the Universiti Kebangsaan Malaysia Research Ethics Committee.

Patient and public involvement

Patients were not involved in this study.

RESULTS

A total of 400 doctors were invited and 240 of them replied (after a reminder), giving a response rate of 60%. Of the participants, 161 (67.0%) were from the government sector and 79 (33.0%) were from the private sector. The mean age of respondents was 33 years (SD ± 7.3). Most respondents (75.8%) were trained in IUD insertion, but significantly fewer private sector doctors had IUD training than government doctors (55.0% vs 86.2%, $P \leq 0.001$). Government doctors had more contraceptive options compared with private doctors. The availability of IUDs, as well as the total number of women requesting family planning services, was also significantly higher in the government sector. More than half of facilities had inserted at least one IUD per month. The proportion of facilities that did not insert an IUD in a month was higher in the private than the government settings (40.5% vs 20.5%).

The knowledge score among all the doctors studied was 'average' (as defined in Methods: score 10–14) with a mean score of 13.6 (SD ± 2.8) from 20 questions, and 39.2% had a 'good' score ($\geq 15/20$). Government doctors had a significantly higher knowledge score than those in the private sector (14.0 ± 2.8 vs 12.7 ± 2.8 , $P = 0.001$). Table 1 summarises the doctors' general knowledge regarding IUDs. Only 30.8% of them could answer correctly regarding IUDs' Pearl index and the majority (68.1%) were unaware that IUDs could be inserted within 48 hours postpartum. Knowledge regarding IUDs as emergency contraception (EC), return of fertility, and IUD insertion at 4 weeks after birth were all significantly better among government compared with private doctors. Linear regression analysis revealed that the number of patients seen in a typical week and number of contraception options available in the facilities were significantly associated with total knowledge of doctors (table 2).

The mean score for Medical Eligibility Criteria (MEC) was good ($5.0/7.0 \pm 1.6$), with no significant difference between the two groups (table 3). Awareness of MEC was significantly higher among government

Research

Table 1 Doctors' correct answers for general knowledge about intrauterine devices

Variables	Sector		Total (n=240)	P value
	Government (n=161)	Private (n=79)		
Maximum length of time a woman can use Multiload Cu 375 IUD after insertion	74 (46.3)	38 (47.5)	112 (46.7)	0.855
Effectiveness of the IUD (Pearl index)	54 (33.8)	20 (25.0)	74 (30.8)	0.166
Return of fertility	134 (83.8)	53 (66.3)	187 (77.9)	0.002
IUD can be used as emergency contraception	124 (77.5)	42 (52.5)	166 (69.2)	<0.001
IUD increased risk of ectopic pregnancy	73 (45.6)	27 (33.8)	100 (41.7)	0.079
Timing of IUD insertion				
Any time during the menstrual cycle	101 (63.1)	47 (58.8)	148 (64.7)	0.511
Within 48 hours postpartum	51 (31.9)	23 (28.7)	74 (30.8)	0.621
Up to 7 days postpartum	113 (70.6)	56 (70.0)	169 (70.4)	0.920
4 weeks after delivery	145 (90.6)	60 (75.0)	205 (85.4)	0.001
Side effects/adverse outcomes				
Headache	147 (91.9)	71 (88.8)	218 (90.8)	0.429
Ectopic pregnancy	122 (76.3)	61 (76.3)	183 (76.3)	1.000
Increase weight	150 (93.8)	73 (91.3)	223 (92.9)	0.477
Migration	136 (85.0)	61 (76.3)	197 (82.1)	0.096
Suitability for IUD				
History of PID a year ago and currently asymptomatic	60 (37.5)	30 (37.5)	90 (37.5)	1.000
History of spontaneous first-trimester abortion	117 (73.1)	57 (71.3)	174 (72.5)	0.759
History of ectopic pregnancy previously	81 (50.6)	31 (36.8)	112 (46.7)	0.082
Breastfeeding	155 (96.9)	74 (92.5)	229 (95.4)	0.230
Diabetes mellitus	135 (84.4)	62 (77.5)	197 (82.1)	0.190
Ischaemic heart disease	129 (80.6)	65 (81.3)	194 (80.8)	0.908
Obesity	142 (88.8)	65 (81.3)	207 (86.3)	0.112

Data expressed in n (%); χ^2 .

IUD, intrauterine device; PID, pelvic inflammatory disease.

doctors. A simple linear regression analysis showed that there was a positive correlation between total MEC score and MEC awareness ($F=6.151$, $P=0.014$), with $R^2=0.025$. The MEC score increased by 0.346

with every increment in MEC awareness. Knowledge of doctors correlated well with the level of previous training (OR 0.318, 95% CI 0.16 to 0.64, $P=0.001$). Simple linear regression showed a significant

Table 2 Analysis model for factors associated with knowledge score

Variables	Linear regression			P value
	B-coefficient	t-test	95% CI	
Knowledge score (constant)		6.16	7.68 to 14.89	<0.001
Age	0.019	0.132	−0.102 to 0.117	0.895
Gender	−0.035	−0.568	−1.028 to 0.568	0.571
Working experience	0.276	3.638	0.596 to 2.004	0.093
Working duration	−0.002	−0.016	−0.010 to 0.010	0.988
Number of patients seen/week	0.127	2.045	0.001 to 0.057	0.042
Type of contraception	0.204	2.456	0.055 to 0.501	0.015
Availability of IUDs in facility	−0.051	−0.619	−1.391 to 0.726	0.536
Number of IUDs inserted/month in the working facility	−0.067	−1.031	−0.520 to 0.163	0.303

IUD, intrauterine device.

Table 3 Knowledge of Medical Eligibility Criteria among doctors

Characteristics	Sector		Total (n=240)	P value
	Government (n= 161)	Private (n= 79)		
*Correct answer MEC for IUD				
History of PID a year ago and currently asymptomatic	60 (37.5)	30 (37.5)	90 (37.5)	1.000
History of spontaneous first-trimester abortion	117 (73.1)	57 (71.3)	174 (72.5)	0.759
History of ectopic pregnancy previously	81 (50.6)	31 (36.8)	112 (46.7)	0.082
Breastfeeding	155 (96.9)	74 (92.5)	229 (95.4)	0.230
Diabetes mellitus	135 (84.4)	62 (77.5)	197 (82.1)	0.190
Ischaemic heart disease	129 (80.6)	65 (81.3)	194 (80.8)	0.908
Obesity	142 (88.8)	65 (81.3)	207 (86.3)	0.112
†Total MEC score	5.1±1.6	4.8±1.7	5.0±1.6	0.156
*Awareness of MEC	107 (66.9)	29 (36.2)	136 (56.7)	<0.001

*Data expressed in n (%); χ^2 .

†Data expressed in mean (SD), t-test.

IUD, intrauterine device; MEC, Medical Eligibility Criteria; PID, pelvic inflammatory disease.

correlation between knowledge score and when the most recent training (within 6 months) had been received ($F=20.182$, $P=0.000$), with a $R^2=0.101$.

Adverse side effects commonly thought to be associated with IUDs such as ectopic pregnancy and pelvic inflammatory disease were more significant concerns among private doctors (table 4). About half of the

private doctors (51.2%) reported unavailability of IUDs in their working place. Otherwise, both government and private doctors agreed that the IUD was a good long-term method of contraception and easily reversible. More government doctors perceived IUDs as an effective contraceptive method compared with private doctors (62.5% vs 45%).

Table 4 Doctors' attitudes towards intrauterine devices

Variables	Sector		Total (n=240)	P value
	Government (n=161)	Private (n=79)		
Side effects which prevent recommendation of IUDs to patients				
Risk of perforation	67 (41.9)	48 (60.0)	115 (47.9)	0.008
Heavy menstrual bleeding	102 (63.7)	43 (53.8)	145 (60.4)	0.135
Increased risk of malignancy	18 (11.3)	10 (12.5)	28 (11.7)	0.776
Increased risk of ectopic pregnancy	59 (36.9)	55 (68.8)	114 (47.5)	<0.001
Increased risk of acquiring PID	75 (46.9)	51 (63.7)	126 (52.5)	0.014
Factors/characteristics which negatively influence IUD recommendation				
Not available in their clinic/not adequate supply in their clinic	49 (30.6)	41 (51.2)	90 (37.5)	0.002
Need extra time for counselling	22 (13.8)	12 (17.5)	36 (15.0)	0.793
It is expensive for clients	9 (5.6)	11 (13.8)	20 (8.3)	0.032
The side effects are too great	11 (6.9)	7 (8.8)	18 (7.5)	0.603
Favour other method	48 (30.0)	33 (41.3)	81 (33.8)	0.082
Factors or features that promote IUD recommendation				
It is a long-term method	137 (85.6)	64 (80.0)	201 (83.8)	0.265
It is easily reversible	121 (75.6)	55 (68.8)	176 (73.3)	0.256
It is being promoted by Ministry of Health	76 (47.5)	32 (40.0)	108 (45.0)	0.271
It is a profitable method	26 (16.3)	16 (20.0)	42 (17.5)	0.471
It is very effective	100 (62.5)	36 (45.0)	136 (56.7)	0.010

Data expressed in n (%); χ^2 .

IUD, intrauterine device; PID, pelvic inflammatory disease.

Table 5 Analysis model for recommending and inserting intrauterine devices

Variables	Logistic regression			
	B-coefficient	Adj B	95% CI	P value
Practice recommends and inserts IUDs (constant)	2.565	13.003		0.097
Gender	0.299	1.348	0.615 to 2.959	0.456
Working experience				
Generalists	0.661	1.835	1.752 to 0.175	0.576
Specialists	1.798	6.637	6.037 to 0.253	0.266
Working duration	0.002	1.002	0.997 to 1.008	0.434
Number of patients seen/week	0.038	1.039	1.004 to 1.075	0.028
Availability of IUDs in facility	−1.355	0.258	0.113 to 0.589	0.001
Been trained previously	−1.838	0.159	0.060 to 0.419	<0.001
Perceived had sufficient knowledge	−0.847	0.429		0.037
Aware of MEC	−0.481	0.618	0.297 to 1.288	0.199
Knowledge group				
High knowledge	−1.709	0.181	0.040 to 0.821	0.027
Average/low knowledge	−1.877	0.153	0.037 to 0.624	0.009

IUD, intrauterine device; MEC, Medical Eligibility Criteria.

As many as 62.5% of doctors perceived that they had sufficient information to counsel their clients about IUDs. A logistic regression analysis demonstrated that perception of the adequacy of IUD information was significantly correlated with the high knowledge score group (Adjust $\beta=0.151$, $P=0.04$, 95% CI 0.042 to 0.540). The mean score of self-efficacy in providing an IUD service was high for both sectors: 22.19 ± 3.50 for government and 20.65 ± 4.00 for private doctors.

More than half of the doctors (54.2%) would recommend and insert IUDs themselves. Government doctors were significantly more positive than private doctors (60.2% vs 34.2%). Only a minority (6.7%) of them did not recommend IUDs to women. Half of the private doctors (50.6%) were likely to recommend IUDs, but referred their clients to other centres for IUD insertion. Multiple logistic regression analysis showed that doctors who were trained previously (OR 0.159, CI 95% 0.060–0.419, $P\leq0.001$) and who perceived that they had sufficient knowledge would continue to recommend and insert IUDs themselves (OR 0.429, CI 95% 0.194–0.949, $P=0.037$) (table 5). This practice also was well correlated with the number of patients seen in a week and availability of IUDs in their working facility. Gender, working experience, sector, as well as MEC awareness, did not appear to influence the current practice of recommendation and insertion of IUDs.

DISCUSSION

This is the first study to explore the knowledge and practice of intrauterine contraception among Malaysian doctors. Most previous studies compared contraception providers by different departments, such as gynaecologists versus primary health clinicians.

The results from our study suggest that a significant gap exists among government and private doctors' knowledge and practice in relation to providing IUD services, especially regarding the efficacy of IUDs. Only 45% of private doctors and 63% of government doctors believed that the IUD is an effective contraceptive method.

Our findings were similar to those of previous studies conducted in other countries.^{7–9} Objectively, our study was an adaptation from a survey among nurses as contraception providers in Nepal.⁸ Surprisingly, our results showed a lower percentage of all correct answers, suggesting a serious knowledge gap among our doctors. However, our doctors' knowledge of intrauterine contraception was better compared with studies conducted in other developing countries.⁹ The rate of correct answers was lower among the private doctors as compared with government doctors for almost all sections of questions and was particularly varied in the total knowledge score. In contrast, studies elsewhere reported that private doctors shared similar levels of knowledge to public doctors.^{8 10} In Malaysia it is known that doctors from the public sector are more likely to receive continuing medical education and to attend professional development meetings. This increases sharing and interchange of information with other healthcare professionals. In contrast, we believe that most of the private doctors run their clinics independently. They may have less contact with the latest research outcomes and guidelines related to contraceptive practice.

Training is indeed an important predictor of knowledge scores as well as current practice among doctors. We found that knowledge was directly related to previous training received and was well correlated

with the perception of sufficient knowledge. Doctors who have been trained with IUD workshops or courses may have higher knowledge scores, and are more likely to recommend and to insert the IUDs themselves and have higher self-efficacy scores. Previous studies have demonstrated that practitioners who had continuing training programmes had higher levels of confidence.¹¹ It has been suggested that doctors who insert IUDs need to insert at least 12 IUDs per year to maintain their skills and confidence levels.¹²

We demonstrated that knowledge level was significantly associated with the number of contraceptive methods provided in a facility. This finding was similar to the study outcome in Nepal.⁸ The providers' knowledge also correlates to the workload of the facility, which is translated into the number of patients seen per week. This evidence supports the theory that knowledge increments are proportional to the exposure to patients.¹³

We found that a large proportion of doctors were unaware of the option of IUD insertion within 48 hours after childbirth. To date, there is no clinical practice guideline regarding IUD insertion in Malaysia. Generally, IUD insertion is done at 6 weeks postpartum. Post-placental IUD insertion has been introduced as women are often highly motivated for contraception at the time of birth, and the discomfort of insertion is minimal.^{14 15} It has been shown to be safe and acceptable to women and is a promising area for future research and practice.^{14–17} Efforts should be made to promote post-placental IUD insertion among Malaysian doctors. Research has documented unintended pregnancy during the 6-week waiting period for insertions after childbirth.¹⁶ Up to 40% of women requesting IUDs are lost during this period, sometimes because providers counsel against IUD usage (16%).^{7 18}

We would like to highlight the survey result on use of IUDs for EC as studies have shown that the method can be used safely up to 5 days after unprotected intercourse.^{19 20} In our study, 69.2% of the doctors were aware that IUD can be used as EC. The rate is higher compared with a study in Egypt when the reported knowledge of IUD as EC was only 40.7%.²¹ However, even though the result is good we did not assess whether our local doctors actually recommend or insert IUDs as EC. Harper *et al* reported that the majority of contraceptive providers (85%) in California had never recommended the copper IUD for EC despite having good knowledge.²² As EC, the IUD can reduce unintended pregnancy by up to 99% and some have reported higher efficacy compared with oral levonorgestrel or ulipristal acetate.^{19 23}

The availability of IUD services in the government sector is higher than in the private sector as it is funded by the government as a means to increase the contraceptive prevalence rate among women. Although 81.9% of the government doctors reported the availability of IUDs in their premises, only 60.2% would

recommend and insert IUDs themselves. This indicates that other factors may influence practice such as knowledge and perceptions towards IUDs. A systematic review reported that the healthcare provider's attitude had a strong influence on the rate of IUD usage.²⁴ The likelihood of prescribing the IUD depends on many factors, including providers' basic knowledge, their training in insertion or removal of IUDs, and the level of patients' counselling.

This study suggests that ongoing training and interval supervision are needed to reduce knowledge deficiency among Malaysian doctors, particularly in the private sector. Translating evidence regarding safety and efficacy of IUDs from clinical trials into daily practice is not an easy task. Evidence must be widely distributed and promoted to increase awareness among doctors. Educational meetings alone or combined with other interventions may improve professional practice and healthcare outcomes for patients. Otherwise, practice will never change.

LIMITATIONS OF THE STUDY

Our study had some limitations. It focused on doctors from a single city and it had a relatively small sample size due to its suboptimal response rate. Consequently the findings of this study should not be generalised to medical practice elsewhere in Malaysia with different settings and different access to health facilities.

CONCLUSION

This study demonstrates that in Malaysia there is still a knowledge and practice gap regarding intrauterine contraception among government and private doctors. The evidence highlights the need for more educational and campaign programmes, focusing particularly on private doctors, to bridge the disparity of provision of IUD services.

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Competing interests None declared.

Patient consent Not required.

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