



OPEN Exploring the availability and acceptability of hormone replacement therapy in LMICs using insights of pharmacists (MARIE Sri Lanka WP2a)

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Hormone Replacement Therapy (HRT) remains underutilised and under-researched in low- and middle-income countries (LMICs), despite its potential to alleviate menopausal symptoms. This study explored pharmacists' perspectives on the use, cost, and availability of HRT across six LMICs. A cross-sectional survey was conducted from January 1 to March 31, 2025, as part of the Global Menopause Project. Pharmacists working in community, hospital, and private sector settings in Malaysia, Sri Lanka, Nepal, Nigeria, Ghana, and Tanzania were recruited. Participants completed an anonymous online questionnaire. The questionnaire was piloted prior to dissemination, assessed HRT availability, pricing, and perceived barriers to use. A total of 331 pharmacists responded: Ghana (18.4%), Sri Lanka (17.5%), Tanzania (16.9%), Nepal (16.6%), Malaysia (15.4%), and Nigeria (15.1%). The respondents were almost equally distributed between sexes (50.8% were female), and most were aged 26–35 years (49.0%). The majority worked in private community pharmacies (41.7%) or government hospitals (32.6%), and 57.4% were based in urban areas. From the sample, 68.9% of pharmacists reported that HRTs were available for dispensing in their respective countries (highest proportion was reported in Nepal, 92.7% and lowest in Nigeria, 42%). HRT costs varied widely, with Sri Lanka reporting the highest prices and Malaysia the lowest. Key barriers identified included low health literacy, economic constraints, and limited healthcare access. Significant disparities exist in HRT access, availability and affordability across LMICs, with urban-rural gaps further compounding inequities. Pharmacists' insights underscore the urgent need for inclusive, equitable strategies in menopausal care and women's health policy in resource-limited settings.

Keywords Availability, Acceptability, Hormone replacement therapy, Low- and Middle-Income countries, Pharmacists

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Hormone Replacement Therapy (HRT) is commonly utilised to manage physiological and psychological symptoms associated with perimenopause, menopause, and post-menopause, whether it occurs naturally, surgically or is medically induced^{1–3}. The decline in circulating concentrations of oestrogen and progesterone during these stages can lead to vasomotor and genitourinary symptoms and mood disturbances⁴. HRT could alleviate these symptoms and offer benefits such as maintenance of bone mineral density and potential cardiovascular protection, particularly when initiated near the onset of menopause^{5,6}.

Women undergoing early or surgical menopause are at heightened risk for vasomotor and low-mood symptoms, sexual dysfunction, and long-term consequences such as osteoporosis, cardiovascular disease, and cognitive decline⁷. Globally, over 70% of women experience vasomotor symptoms during menopause, with many reporting substantial impacts on sleep, mental health, work productivity, and overall quality of life. Therefore, HRT could act as a preventive strategy to mitigate these risks^{8,9}. Moreover, following the publication of the Women's Health Initiative (WHI) trial, global HRT use declined sharply due to concerns about increased risks of breast cancer and cardiovascular disease. However, subsequent analyses have revealed that the risk–benefit profile is more favourable for younger women or those initiating treatment near the onset of menopause. Clinical decision making regarding the use of HRT requires an individualised and evidence-based risk–benefit assessment^{5,6,10}.

As the global population of women continue to rise, the demand for optimal menopausal care is expected to grow. In high-income countries (HICs), HRT is commonly prescribed as part of standard menopausal care, to improve quality of life and long-term health outcomes⁷. However, the use of HRT is far from universal, especially in low- and middle-income countries (LMICs), where its availability and acceptability remain limited due to several interconnected factors such as economic constraints¹¹, inadequate healthcare infrastructure, and a lack of public awareness regarding menopausal health¹². The decision to use HRT is also influenced by cultural attitudes towards menopause, which may vary significantly across regions¹³. In some societies, menopause is viewed as a natural phase of life, and women may be reluctant to seek medical treatment, particularly one that involves hormonal interventions^{14,15}. Furthermore, the cost of medicines, which is often more prohibitive in LMICs relative to the national average earnings and due to importation taxes and limited production, can also act as a significant barrier¹⁶.

While the World Health Organisation has highlighted the need for affordable healthcare access for women¹⁷, the implementation of such recommendations remains uneven, with many countries struggling to provide comprehensive treatment options for menopausal women.

Pharmacists, as key healthcare professionals, play a crucial role in achieving this, shaping the accessibility and acceptability of medications like HRT particularly in HICs such as the United Kingdom^{7,18}. In LMICs, pharmacists may face challenges such as limited professional autonomy, lack of menopause-focused continuing education, and gender dynamics that can hinder open discussions about menopausal symptoms with women clients. Despite the importance of pharmacists in the healthcare delivery process, there is a paucity of research data examining their views and practices on the availability and acceptability of HRT in LMIC settings. This gap highlights the need for a more nuanced understanding of how pharmacists view and address the barriers linked to HRT use in LMICs. To gain initial insights, we developed a pilot study as part of a multifaceted global menopause project, MARIE¹⁹ to explore the perspectives of pharmacists on HRT use, cost and availability across six LMICs.

Methods

Study design and participants

This is a cross-sectional study conducted as a part of the multifaceted global menopause project, MARIE (Supplementary file 1), and is reported according to the Strengthening the Reporting of Observational Studies (STROBE) in Epidemiology guidelines for cross-sectional studies (Supplementary file 2)²⁰.

Pharmacists working in community, public and private hospital settings in Malaysia, Sri Lanka, Nepal, Nigeria, Ghana and Tanzania were included. The study was conducted from the 1st of January to the 31st of March 2025, and participants were invited using e-posters to participate in an anonymous online survey to prevent bias.

The online survey was made available in English language. The survey was actively promoted by MARIE project Principal Investigators (PIs) based in Sri Lanka, Malaysia, Nepal, Nigeria, Ghana and Tanzania. Survey

was promoted through pharmacists' professional groups, with PIs assigning a few pharmacists to collect responses from their peers. As a result, only pharmacists accessed the questionnaire, primarily within hospital and community pharmacy settings, as well as through professional pharmacy networks.

Data collection tool

Data was collected using a structured online questionnaire (Supplementary file 3). Open-ended follow-up questions were used to obtain detailed descriptions.

The questionnaire was content and face-validated using experts in the field and pretested with 10 pharmacists prior to data collection.

Sample size calculation

The below formula was used to calculate the sample size for each country.

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

N = population

e = margin of error (percentage in decimal form)

z = z -score* (how many standard deviations the data is from the mean)

*A 95% confidence level is a z -score of 1.96.

The number of pharmacists in Sri Lanka is steadily declining as qualified professionals migrate overseas. As of November, re-registration data from the Sri Lanka Medical Council (SLMC) indicated that only 6,700 pharmacists were actively practising across the country²¹.

In Nigeria, although there are 21,892 registered pharmacists, only 12,807 (58.5%) were actively licensed and practicing as of 2016, based on data from the Pharmacists Council of Nigeria²².

Malaysia has 19,260 registered pharmacists with active practising certificates, regulated by the Pharmacy Board of Malaysia under the country's pharmacy laws²³.

Tanzania has 2111 pharmacists registered to practice²⁴.

In Ghana, the Pharmacy Council regulates the practice of pharmacy professionals. According to recent data, there are approximately 9,000 registered pharmacists in the country, with around 7,000 reported to be in active practice²⁵.

In Nepal, 4,829 pharmacists were registered with the Nepal Pharmacy Council as of March 25, 2020²⁶.

Given the varying number of active pharmacists across these countries and for the purpose of maintaining consistency and comparability across data sources, we have decided to recruit a sample size of 50 pharmacists per country, with an additional 5 participants per country to account for potential non-response or incomplete data.

Statistical analyses

Aiming to recruit a sample of 50 pharmacists as a minimum per country across six countries yielded a sample of 331 participants. We summarised demographic and professional characteristics using frequencies (%), and compared responses across countries using the Chi-square or Fisher's exact tests for categorical variables like gender, age, educational level, location. A thematic analysis was conducted on open-ended responses from pharmacists to explore underlying perspectives and contextual factors influencing HRT use. This qualitative approach enabled the identification of recurrent patterns, attitudes, and perceived barriers across diverse healthcare settings.

Ethical aspects

The data collection was led by the MARIE-Sri Lanka team following approval from the Ethics Review Committee at the Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka (Reference number: 2024-07-421) addition to the already available ethical approvals in all the six countries to conduct the multifaceted global menopause project. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Additionally informed consent was obtained from all participants prior data collection.

Results

Socio-demographic characteristics of pharmacists

The survey collected responses from 331 pharmacists across six countries: Sri Lanka (17.5%, $n=58$), Tanzania (16.9%, $n=56$), Malaysia (15.4%, $n=51$), Ghana (18.4%, $n=61$), Nigeria (15.1%, $n=50$), and Nepal (16.6%, $n=55$). A total of 49% ($n=162$) of the pharmacists were aged between 26 and 35 years, and 50.8% ($n=168$) were female.

Among the respondents, 41.7% ($n=138$) worked in private community pharmacies (Sri Lanka (23.1%, $n=32$), Tanzania (15.9%, $n=22$), Malaysia (8.7%, $n=12$), Ghana (29%, $n=40$), Nigeria (13.8%, $n=19$), and Nepal (9.4%, $n=13$)), 32.6% ($n=108$) worked in government hospitals (Sri Lanka (13.8%, $n=15$), Tanzania (14.8%, $n=16$), Malaysia (34.2%, $n=37$), Ghana (3.7%, $n=4$), Nigeria (21.3%, $n=23$), and Nepal (12%, $n=13$)) and 16.6% ($n=55$) were employed in private hospitals (Sri Lanka (3.6%, $n=2$), Tanzania (14.5%, $n=8$), Malaysia (3.6%, $n=2$), Ghana (21.8%, $n=12$), Nigeria (7.3%, $n=4$), and Nepal (49.1%, $n=27$)). A smaller proportion

Characteristics	Sri Lanka (n=58)	Tanzania (n=56)	Malaysia (n = 51)	Ghana (n = 61)	Nigeria (n = 50)	Nepal (n = 55)	Total	Chi-square P value
Gender								
Female	37 (63.8%)	26 (46.4%)	38 (74.5%)	26 (42.6%)	24 (48%)	17 (30.9%)	168 (50.7%)	<0.0001
Male	21 (36.2%)	30 (53.6%)	13 (25.5%)	35 (57.4%)	26 (52%)	38 (69.1%)	163 (49.3%)	
Age groups								<0.0001
20 to 25 years	5	10	0	21	2	8	46 (13.9%)	
26 to 30 years	6	14	12	16	23	12	83 (25.1%)	
31 to 35 years	10	14	15	13	14	13	79 (23.9%)	
36 to 40 years	15	6	12	9	2	10	54 (16.3%)	
41 to 45 years	6	8	8	2	6	10	40 (12.1%)	
46 to 50 years	9	2	2	0	0	0	13 (3.9%)	
51 to 55 years	3	2	2	0	2	1	10 (4.8%)	
Above 56 years	4	0	0	0	1	1	6 (0.3%)	
Highest educational qualification								<0.0001
Certificate of Proficiency or Efficiency	28	8	0	2	0	7	45 (13.6%)	
Higher National Diploma	6	26	0	0	0	12	44 (13.3%)	
BSc in Pharmacy	2	12	3	49	9	1	76 (23%)	
BPharm	20	4	39	4	33	16	116 (35%)	
Postgraduate	2	4	7	6	7	17	43 (13.0%)	
Other	0	2	2	0	1	2	7 (2.1%)	
Position in professional group								<0.0001
Community Pharmacist- Government	7	6	0	0	0	0	13 (3.9 %)	
Community Pharmacist- Private	32	22	12	40	19	13	13 (41.7 %)	
Hospital Pharmacist - Government	15	16	37	4	23	13	108 (32.6 %)	
Hospital Pharmacist - Private	2	8	2	12	4	27	55 (16.6 %)	
Other	2	4	0	5	4	2	17 (5.1 %)	
Urbanisation								0.0065
Rural	6	9	8	2	3	4	32 (9.7%)	
Semi-urban	14	24	22	16	20	13	109 (32.9%)	
Urban	38	23	21	43	27	38	190 (57.4%)	

Table 1. Socio-demographic characteristics of pharmacist.

of respondents worked in government community pharmacies (3.9%, $n=13$) or in other sectors like clinical pharmacy and regulatory pharmacy (5.1%, $n=17$). There was a statistically significant difference in the distribution of pharmacists' positions across professional groups by country ($\chi^2 = 141.3$, $p < 0.0001$).

Among the respondents, 35% ($n=116$) held a Bachelor of Pharmacy (BPharm) degree, while 23% ($n=76$) had a Bachelor of Science in Pharmacy (BSc in Pharmacy). Additionally, 13.6% ($n=45$) held a Certificate of Proficiency or Efficiency, and 13.3% ($n=44$) had a Higher National Diploma. The remaining respondents held postgraduate qualifications, including Master of Pharmacy (MPharm) (8.8%, $n=29$), Doctor of Pharmacy (PharmD) (2.1%, $n=7$), Doctor of Philosophy (PhD) (1.2%, $n=4$), Master of Philosophy (MPhil) (0.9%, $n=3$), and other degrees (2.1%, $n=7$). There was statistically significant heterogeneity in the distribution of the highest educational qualifications across countries ($\chi^2 = 371.5$, $p < 0.0001$).

Most of the pharmacies (57.4%, $n=190$) were based in urban areas, while 32.9% ($n=109$) were in semi-urban areas, and 9.7% ($n=32$) were in rural areas. There was a statistically significant difference in the distribution of pharmacy locations by level of urbanisation (urban, semi-urban and rural) across countries ($\chi^2 = 24.43$, $p = 0.0065$).

Socio-demographic characteristics of pharmacists are presented in Table 1.

Pharmacists' awareness and availability of HRT for dispensing

Among the total respondents, 91.5% ($n=303$) of pharmacists were aware that HRT is prescribed for perimenopausal, menopausal, and postmenopausal women. There was statistically no significant difference between countries in terms of their awareness ($\chi^2 = 9.246$, $p = 0.0996$). Although 91.5% of surveyed pharmacists reported being aware of HRT, further analysis of their responses revealed notable misconceptions regarding its definition and application. Specifically, some respondents identified oral contraceptives as forms of HRT in all the countries, reflecting a misunderstanding of the distinct therapeutic indications and hormonal compositions of these treatments. Furthermore, explanations provided by pharmacists for patients' reluctance to initiate HRT included reasons such as "consuming emergency contraceptive pills", "misconceptions about family planning prevent them from accessing these services" and "not being with their husbands or having no intention of further childbearing, hence perceiving no need for HRT" as noted in Ghana.

Among all respondents, 68.9% ($n=228$) of pharmacists reported that HRTs were available for dispensing in their respective countries. The highest proportion was reported in Nepal (92.7%, $n=51$), while the lowest was in Nigeria (42%, $n=21$). There was a statistically significant difference among countries regarding the availability of HRTs for dispensing ($\chi^2 = 56.77$, $p < 0.0001$).

The most commonly available HRTs reported by pharmacists included Estradot (estradiol), Femoston (estradiol and dydrogesterone), Progynova (estradiol valerate), Tibolone, Depo-Provera (medroxyprogesterone acetate), Angeliq (drospirenone and estradiol), Provera (medroxyprogesterone acetate), Lenzetto (estradiol), Combi-Patch (estradiol and norethindrone), Evorel (estradiol and norethisterone), Duphaston (dydrogesterone), Duavee (estrogens and bazedoxifene), Prometrium (micronized progesterone), and Premarin vaginal cream (conjugated estrogens). Additionally, perimenopausal women were also using intrauterine devices such as

Mirena (levonorgestrel) and Eloira (levonorgestrel). Depo-Provera was available for all six countries. The HRTs reported as available across the countries are presented in Supplementary Table 1.

In Sri Lanka, the majority of pharmacists (72.4%, $n = 42$) incorrectly identified oral contraceptive pills (OCPs) or emergency contraceptive pills as HRTs. Similarly, some pharmacists in other countries also mistakenly identified OCPs or emergency contraceptive pills as HRTs, including Tanzania (16.0%, $n = 9$), Malaysia (9.8%, $n = 5$), Ghana (13.1%, $n = 8$), Nigeria (10%, $n = 5$), and Nepal (7.8%, $n = 4$).

HRT pricing variations across countries

HRT pricing varied significantly across the countries. In Sri Lanka, the Mirena coil was the most expensive HRT at US\$101, followed by Depo-Provera at US\$25. In contrast, Malaysia offered the most affordable options, with Progynova priced as low as US\$0.20, followed by Provera (US\$6), Premarin (US\$18), Angeliq and Depo-Provera (each at US\$22), and Tibolone (US\$25). Nepal displayed a moderate pricing structure, with the Mirena coil available at US\$36, Femoston Mono at US\$22, and Premarin at US\$5.50. Nigeria reported relatively lower prices for some products, such as Depo-Provera at US\$3 and Progynova at US\$25, though vaginal oestrogen was higher at US\$38. Tanzania reported the highest prices for certain products, including Lenzetto at US\$122 and Depo-Provera at US\$120, while Angeliq and vaginal oestrogen were priced at US\$19 and US\$60, respectively. Ghana's prices fell in the mid-to-high range, with Depo-Provera at US\$65, Provera at US\$40, Progynova at US\$10, vaginal oestrogen at US\$20, and Tibolone at US\$20.

HRT dosages across countries

Sri Lankan pharmacists have reported only the doses of Depo-Provera (150 mg) and Femoston (1 mg and 2 mg).

In Tanzania, Depo-Provera was reported in 75 mg to 150 mg doses. Duavee (conjugated oestrogen) was available in 0.625 mg and 1.25 mg strengths. Vaginal cream was dispensed in amounts of 1–2 g. Other formulations included Evorel 25mcg, Mirena coil (levonorgestrel) 150 mg, and Duphaston 10 mg.

Malaysian pharmacists reported Premarin was available in a 0.625 mg dose. Depo-Provera came in a 150 mg dosage. Provera was available in dosages ranging from 5 mg to 10 mg. Progynova was offered in doses of 1 mg to 2 mg. Prometrium was available in a 100 mg dose. Estradiol was available in a 1 mg dose, while Dydrogesterone was offered in a 10 mg dose. Evorel came in dosages ranging from 1 mg to 2 mg. Lastly, Femoston-Conti combined 1 mg of estradiol and 5 mg of dydrogesterone.

In Ghana, Depo-Provera was available in a 150 mg dosage. Progynova was offered in doses ranging from 1 mg to 2 mg. Estriol vaginal cream (Ovestin) was available in a 500 mcg dosage. Provera was available in a 5 mg dose. Cyclogest pessaries were offered in dosages of 200 mg to 400 mg. Vaginal estrogen tablets were available at 10mcg per tablet. Tibolone tablets came in a 2.5 mg dose. Vaginal creams were available in concentrations of 0.1% and 0.01%. Estradot transdermal patches were offered in dosages of 25mcg, 50mcg, 75mcg, and 100mcg. Estradot spray was available at 1.53 mg per spray. Evorel transdermal patches were available in dosages of 25mcg, 50mcg, 75mcg, and 100mcg. Femoston Mono tablets were available in dosages of 1 mg and 2 mg. Estradot gel was offered in 0.5 mg, 1 mg, and 1.5 mg dosages.

Provera was available in dosages of 2.5 mg, 5 mg, and 10 mg in Nigeria. Duphaston was available in a 10 mg dosage. Progynova was offered in doses of 1 mg, 2 mg, and 10 mg. Levofem, which contains 0.15 mg of Levonorgestrel and 0.03 mg of Ethinylestradiol, was available with ferrous. Duavee was available in a 500mcg dose. Depo-Provera was available in a 150 mg dosage. Testosterone was available in a 100 mg dose. Premarin (Conjugated Estrogen) tablets were available in dosages of 0.3 mg, 0.625 mg, 0.9 mg, and 1.25 mg. Premarin vaginal cream was available at a concentration of 0.625 mg per gram, and Premarin estrogen cream was available in a 0.625 mg dose.

Nepal reported Premarin estrogen cream was available in a 0.625 mg dose. Estradot was offered in dosages of 1 mg and 2 mg, and conjugated estrogen was available at 0.625 mg. Eloira IUD, which contains 20mcg of levonorgestrel, and Mirena coil with 20mcg of levonorgestrel were available. Susten was offered in 100 mg and 200 mg dosages. Edil was available in 1 mg and 2 mg doses. Ovral L, Ovral G, Loette, Premarin, and Dydrogesterone (2 mg) were available. Delivery was available in a 10 mg dose. Conjugated estrogen tablets were offered in dosages of 0.625 mg and 0.3125 mg. Estradiol vaginal cream was available at a concentration of 0.01%. Estradiol (2 mg) and Dydrogesterone (10 mg) were available together. Depo-Provera was available in 50 mg, 100 mg, and 150 mg dosages. Testosterone was available in dosages ranging from 0.03 mg to 1.5 mg. Duphaston was available in a 10 mg dose. Gestofit and Estroflav capsules were available in dosages of 100 mg and 200 mg. And also, Femoston Mono tablets were available in dosages ranging from 1 mg to 10 mg.

Dosage forms preferred by patients

According to pharmacists, tablets were the most preferred dosage form for HRT among patients (79.2%), followed by vaginal gels/creams (32%), transdermal patches (15.7%) and vaginal or nasal sprays (5.7%). There was a statistically significant difference in the types of HRT dosage forms available between countries ($\chi^2 = 68.64$, $p < 0.0001$).

Pharmacists view on level of awareness of HRT among the patients

According to pharmacists across all six countries, the level of awareness and understanding of HRT among patients was very low, with 88.8% reporting limited knowledge. Among them, view of the Nepal pharmacists showed the highest awareness and understanding of HRT among patients (20%) (Supplementary Table 2). However, there was no significant difference between countries in terms of patients' level of awareness regarding HRT ($\chi^2 = 9.96$, $p = 0.0763$).

The majority of pharmacists (57.1%) expressed willingness to discuss HRT with perimenopausal, menopausal, and postmenopausal women. Among the total, 67.4% of pharmacists believed that alternative non-pharmacological treatments can help manage menopausal symptoms.

For the question, “**In your experience, what are the main challenges or barriers that prevent women in underserved communities from accessing HRT?**” pharmacists consistently identified a range of socio-cultural, educational, economic, and healthcare system-related barriers that hamper women in underserved communities from accessing HRT. Out of those themes ‘Lack of Awareness and Health Literacy’, ‘Economic Constraints and Drug Affordability’ and ‘Limited Access to Healthcare Facilities and Providers and Availability’ were the most commonly mentioned barriers and challenges by pharmacists from different countries (Supplementary file 4, Supplementary Tables 3 and Supplementary Fig. 1).

For the question, “**What resources, training, or support would help you better advise and provide HRT to underserved populations in your practice?**” pharmacists identified several strategic areas for strengthening their ability to support and counsel women in underserved communities regarding HRT. Their responses revealed common themes across educational, infrastructural, financial, and regulatory domains. Out of those support suggested ‘Training and Professional Development’, ‘Community and Patient Education Resources’ were the most commonly suggested support by pharmacists from different countries (Supplementary file 5 and Supplementary Table 4).

Discussion

Pharmacists are uniquely positioned to provide expert advice on medicines and healthcare, as well as to prescribe in some countries and supply medications to women throughout all stages of life²⁷. Pharmacists can offer advice on alternatives, provided such practices are permitted under their country’s professional standards a role that is also exercised in the countries like UK, Australia, USA and Canada²⁸. Although pharmacists play a critical role in healthcare systems, especially in LMICs, limited research has explored their perspectives and practices regarding the accessibility and acceptability of HRT. This lack of evidence underscores the importance of understanding how pharmacists perceive and manage the challenges associated with HRT use in these settings. To begin addressing this gap, we conducted a pilot study aimed at investigating pharmacists’ views on HRT usage, affordability, and availability across six LMICs. With participation from 331 pharmacists across six LMICs, and the survey achieved balanced geographic representation with a minimum of 50 respondents per country. The majority of pharmacists were between 26 and 35 years of age, and gender distribution was nearly equal, indicating a relatively young and gender-balanced workforce. A significant proportion were employed in private community pharmacies (41.7%), with others working in government hospitals (32.6%) and private hospitals (16.6%). More than half of the pharmacists held a bachelor’s degree in pharmacy (58%), while a smaller proportion had postgraduate qualifications (13%), suggesting a moderate level of academic advancement. The majority of pharmacies (57.4%, $n = 190$) were located in urban areas, followed by 32.9% ($n = 109$) situated in semi-urban settings.

Although a high proportion of pharmacists (91.5%) reported awareness that HRT is prescribed for perimenopausal, menopausal, and postmenopausal women, qualitative responses revealed notable gaps in understanding. The findings reveal a concerning gap in pharmacists’ knowledge regarding HRT, particularly in Sri Lanka, where a majority (72.4%) incorrectly identified OCPs or emergency contraceptive pills as HRTs. This misconception was also observed, albeit to a lesser extent, among pharmacists in several other countries, including Tanzania, Malaysia, Ghana, Nigeria, and Nepal. This conflation highlights a superficial level of awareness, where general recognition of HRT exists, but detailed knowledge about its specific indications, mechanisms, and appropriate use remains limited. These responses suggest a conflation between HRT and family planning methods, raising concerns about the depth and accuracy of pharmacists’ knowledge regarding the role of HRT in managing menopausal symptoms rather than fertility regulation. Such findings underscore the need for targeted educational interventions to address gaps in understanding among pharmacy professionals, particularly in distinguishing HRT from contraceptive therapies. Availability of HRTs varied significantly across the surveyed countries, with 68.9% of pharmacists overall reporting that these therapies were accessible for dispensing. Nepal reported the highest availability (92.7%), indicating a well-established supply or demand for HRT in the country. In contrast, Nigeria had the lowest reported availability (42%), suggesting potential challenges in access, supply chain logistics, regulatory approvals, or demand for menopausal care. The reported availability of HRT among pharmacists suggests access to a range of commonly prescribed formulations. Products such as Estradot, Femoston, Progynova, Tibolone, Angeliq, and Provera reflect a mix of estrogen-only and combined estrogen-progestogen therapies, catering to diverse patient needs.

Therefore, this study offers a unique multi-country perspective on the availability and accessibility of HRT in LMICs viewed through the lens of practicing pharmacists. As frontline healthcare providers and readily accessible medication counsellors, pharmacists play a crucial role in guiding menopausal women toward appropriate therapeutic options. The findings highlight significant gaps influenced by pharmacists’ knowledge, infrastructural limitations, and socio-cultural factors, which collectively hinder the optimal use of HRT among underserved populations. Most importantly the findings indicated that pharmacists in Sri Lanka possess the poorest knowledge regarding available HRT dosing protocols, suggesting that HRT is not a commonly dispensed medication in the Sri Lankan healthcare setting.

By investigating the factors that influence pharmacists’ perceptions and practices related to HRT, this research provides valuable insights for policymakers, healthcare providers, and advocates seeking to improve menopausal care in these regions. Ultimately, the findings can inform strategies to enhance the accessibility, affordability, and acceptability of HRT, thereby improving the health and well-being of women in LMICs.

Given their proximity to both patients and the healthcare system, pharmacists offer critical insights into the barriers and facilitators surrounding HRT use. These include logistical challenges such as inconsistent

supply chains, regulatory hurdles, and limited availability of therapeutic alternatives. Furthermore, pharmacists' understanding of HRT's benefits and risks, their training, and attitudes toward menopause care directly influence patient acceptance and adherence to treatment.

Barriers to HRT access identified in this study are consistent with broader determinants of health inequity in LMICs—such as economic constraints, medication shortages, and poor access to specialized care. Due to the high prices of these HRTs compared to the other medicines, people in some of the countries cannot afford these and those are not readily available in the pharmacies as well. In our study it clearly showed that HRT pricing varied significantly across the countries. In Sri Lanka, the Mirena coil was the most expensive HRT at US\$101, followed by Depo-Provera at US\$25. In contrast, Malaysia offered the most affordable options, with Progynova priced as low as US\$0.20. That is a common issue for most of the countries that we studied. In addition, socio-cultural factors including stigma, religious beliefs, patriarchal decision-making, and embarrassment in discussing menopausal symptoms further restrict women's willingness or ability to seek care. These findings echo the World Health Organization's call for culturally sensitive, gender-responsive health systems that deliver comprehensive care throughout a woman's lifespan.

Encouragingly, pharmacists across all six countries expressed a strong willingness to play a more active role in HRT counselling, provided they receive appropriate support. The need for continuing professional development (CPD), access to updated clinical guidelines, multilingual patient education resources, and broader public health campaigns was consistently emphasized. Moreover, pharmacists underscored the importance of integrating HRT education into wider community health initiatives via media, seminars, and digital platforms—demonstrating the potential for scalable, low-cost interventions that could improve menopause care across diverse LMIC settings.

Importantly, this study sheds light on the structural barriers to HRT implementation. In several settings, pharmacists noted the lack of HRT availability in public-sector formularies and the concentration of services in urban or tertiary facilities. Additionally, some reported that even when HRT was available, affordability remained a major obstacle for postmenopausal women, many of whom are financially dependent or uninsured. Addressing these systemic issues requires multi-sectoral coordination involving national health authorities, pharmaceutical suppliers, and local health facilities. According to the study by the same research group, Brazil offers 18 out of 20 HRT options that they studied, closely followed by Nigeria with 17. Ghana and Nepal have the most limited access, with six and three medicines available, respectively. Sri Lanka provides a moderate selection of nine medicines. And also the same study has showed significant cost disparities between HRT medicines and menopause-related gynaecological services across Brazil, Ghana, Malaysia, Nepal, Nigeria, and Sri Lanka. Brazil offers a broad range of HRT options at moderate prices, like Angeliq at \$36.7 (£28.23), while Nigeria, despite wide availability, shows high prices, with Angeliq at \$598.5 (£460.85)¹¹.

This is the first study conducted to explore the availability and acceptability of HRT among pharmacists. A qualitative study conducted by Barber and Charles (2023) among menopausal women, general practitioners (GPs), and gynecologists in United Kingdom revealed similar qualitative themes. Among women, perceptions of HRT were largely influenced by beliefs about the risk of breast cancer. The GPs demonstrated a lack of knowledge regarding HRT, alternative treatment options, and the broader health benefits—similar to the gaps identified among pharmacists in the present study²⁹. Similarly, Yeganeh et al. (2017) reported knowledge barriers among healthcare practitioners regarding HRT, which are consistent with the knowledge gaps observed among pharmacists in the present study³⁰. Furthermore, a recent Swedish study found that only 41.9% of GPs demonstrated adequate awareness of HRT³¹. Similar to the present study, where 91.5% of pharmacists were aware of HRT, a study conducted by Elmahjoubi et al. (2021) reported that 87% of pharmacists had awareness regarding HRT³².

Women in these six LMICs have fewer HRT options available for managing menopausal symptoms compared to women in high-income countries such as Sweden and the UK, which had 47 and 67 HRT products available, respectively, as of 2004³³.

The insights derived from this cross-sectional study even with some limitations and strengths contribute to the limited but growing body of evidence on menopausal care in LMICs which lead to several recommendations. They highlight the under-recognised yet critical role of pharmacists in bridging knowledge gaps and improving access to evidence-based therapies. Training pharmacists to provide accurate, empathetic, and culturally appropriate menopause counseling may serve as a cost-effective strategy to expand HRT reach and uptake in resource-constrained environments.

Strengths and limitations

The use of six LMICs has provided us valuable insights to conduct a much wider study to better evaluate perceptions and practices among pharmacists, and potentially across other healthcare professionals, where evidence-based-policies and guidelines can be put in place that is useful for these regions. While acknowledging the strengths of this study, several limitations should be considered. The data were collected through an online survey, which may introduce selection bias and limit the generalisability of the findings. The study was conducted among pharmacists from only six LMICs, with a minimum of 50 participants per country. As such, the sample may not be representative of the broader pharmacist population across all LMICs. Furthermore, the findings are based on self-reported data regarding participants' awareness and knowledge, which may not accurately reflect their actual competencies or practices. Social desirability bias and misreporting cannot be ruled out.

Conclusion

Pharmacists across the six surveyed countries generally demonstrated a high level of awareness that HRT is intended for use among menopausal women. However, this awareness did not always translate into accurate knowledge, as significant misconceptions were identified, most notably in Sri Lanka, where a majority confused HRT with oral contraceptives or emergency pills. Similar misunderstandings were observed in other countries,

pointing to widespread confusion regarding HRT's true purpose, indications, and components. Availability of HRT also varied considerably, with some countries having broad access and others facing limitations. While certain formulations like Depo-Provera were commonly available, the range and consistency of other HRT options differed. Pricing disparities further complicated access, with some countries offering affordable therapies while others presented prohibitively high costs for common products. Furthermore, knowledge about HRT dosages and formulations was inconsistent. In some regions, particularly Sri Lanka, pharmacists showed limited familiarity with dosage variations, while others, like Ghana and Malaysia, exhibited a broader understanding, likely due to better exposure or training.

Recommendations

To address the identified gaps in knowledge, misconceptions, and access to HRT, several targeted strategies are recommended. First, incorporating updated and evidence-based content on menopause and HRT into pharmacy education and ongoing professional development programs is essential. This will help ensure pharmacists are equipped with accurate knowledge about the indications, formulations, and dosing of HRT. Second, public health authorities should implement awareness campaigns to clarify widespread misconceptions, particularly the confusion between HRT and contraceptives, which were notably prevalent in some regions. These campaigns should aim to educate both healthcare providers and the general public. Third, to improve access and reduce disparities in availability and cost, governments and healthcare systems should explore ways to regulate HRT pricing and consider subsidy mechanisms to make essential therapies more affordable. Finally, establishing standardized, country-specific guidelines for pharmacists on HRT use can promote consistent counselling and dispensing practices. Together, these recommendations support safer, more equitable, and better-informed use of HRT in diverse healthcare settings.

Data availability

The data that support the findings of this study are stored within protected database. Restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however may be available from the authors upon reasonable request from Professor Peter Phiri.

Received: 19 May 2025; Accepted: 29 August 2025

Published online: 30 October 2025

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Acknowledgements

MARIE Consortium: Aini Hanan binti Azmi, Alyani binti Mohamad Mohsin, Arinze Anthony Onwuegbuna, Artini binti Abidin, Ayyuba Rabi, Chijioke Chimbo, Chinedu Onwuka Ndukwe, Jean Pierre Gafaranga, Emmanuel Habimana, Choon-Moy Ho, Chinyere Ukamaka Onubogu, Jeevan Dhanarisi, Damayanthi Dassanayake, Diana Suk-Chin Law, Divinefavour Echezona Malachy, Donatella Fontana, Emmanuel Chukwubikem Egwuatu, Eunice Yien-Mei Sim, Eziamaka Pauline Ezenkwele, Farhawa binti Zamri, Fatin Imtithal binti Adnan, Geok-Sim Lim, Halima Bashir Muhammad, Ifeoma Bessie Enweani-Nwokelo, Ikechukwu Innocent Mbachu, Isaiah Chukwuebuka Umeorane, Jinn-Yinn Phang, John Yen-Sing Lee, Joseph Ifeanyichukwu Ikechebelu, Juhaida binti Jaafar, Karen Christelle, Kathryn Elliot, Kim-Yen Lee, Kingsley Chidiebere Nwaogu, Lee-Leong Wong, Lydia Ijeoma Eleje, Min-Huang Ngu, Nicholas Panay, Noorhazliza binti Abdul Patah, Nor Fareshah binti Mohd Nasir, Norhazura binti Hamdan, Nnanyelugo Chima Ezeora, Nnaedozie Paul Obiegbu, Nurfauzani binti Ibrahim, Nurul Amalina Jaafar, Odigonma Zinobia Ikpeze, Obinna Kenneth Nnabuchi, Pooja Lama, Pradip Mitra, Prasanna Herath, Puong-Rui Lau, Rakshya Parajuli, Rakesh Swarnakar, Ramya Palanisamy, Raphael Ugochukwu Chikezie, Rosdina Abd Kahar, Safilah Binti Dahian, Sapana Amatya, Sing-Yew Ting, Siti Nurul Aiman, Sunday Onyemaechi Oriji, Susan Chen-Ling Lo, Sylvester Onuegbunam Nweze, Thamudi Sundarapperuma, Vaitheswari Rao, Xin-Sheng Wong, Xiu-Sing Wong, Yee-Theng Lau, Nana Mintah-Afful, Ganesh Dangal, Carol Atkinson, Lamiya Al-Kharusi, Kathryn Elliot, Julie Taylor, Chigozie Geoffrey Okafor, Chukwuemeka Chidin-du Njoku, Assumpta Chiemeka Osunkwo, Gabriel Chidera Edeh, Esther Ogechi John, Kenekchukwu Ezekwesili Obi, Oludolamu Oluyemesi Adedayo, Odili Aloysius Okoye, Chukwuemeka Chukwubikem Okoro, Ugoy Sonia Ogbonna, Chinelo Onuegbuna Okoye, Babatunde Rufus Kumuyi, Onyebuchi Lynda Ngozi, Nnenna Josephine Egbonnaji, Oluwasegun Ajala Akanni, Perpetua Kelechi Enyinna, Yusuf Alfa, Theresa Nneoma Otis, Catherine Larko Narh Menka, Kwasi Eba Polley, Isaac Lartey Narh, Bernard B. Borteh, Kingshuk Majumder, Victoria corkhill, Andy Fairclough.

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The views expressed are those of the authors and not necessarily those of the NHS, the National Institute for Health Research, the Department of Health and Social Care or the Academic institutions.

Author contributions

GD developed the ELEMI program and conceptualised this paper. VP collected data from Sri Lanka, OK from Nepal, THT from Malaysia, GE from Nigeria, FT and NM from Ghana, and BM from Tanzania. VP analysed the data and wrote the first draft, which was furthered by all other authors. All authors critically appraised, reviewed, and commented on all versions of the manuscript.

Funding

NIHR Research Capability Fund.

Declarations

Competing interests

The authors declare no competing interests.

Consent for publication

All authors read and approved the final manuscript and have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

Additional information

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1038/s41598-025-18083-x>.

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