

# Assessing the Impact of Clinical Pharmacist Led Education Modality Towards Knowledge, Attitude and Practice (KAP) among Gestational Hypothyroid Patients

Gangayya J. Wakkundmath, Muriel Lacerda, Roshan Abraham Ajit, Nida Yusuf, Geetanjali Salimath\*

Department of Pharmacy Practice, KLE College of Pharmacy, KLE Academy of Higher Education and Research, Belagavi, Karnataka, INDIA.

## ABSTRACT

**Background:** Hypothyroidism is the most prevalent endocrine condition among women of reproductive age, affecting 3-5% of the entire pregnant population. If left untreated, it can lead to serious maternal and fetal complications. Knowledge, Attitude and Practice (KAP) surveys are quantitative approaches employed to assess these aspects within a predetermined population utilizing standardized questionnaires. **Materials and Methods:** A prospective interventional study was conducted in the Obstetrics and Gynaecology department of a tertiary care hospital. Different educational modalities, namely Patient Information Leaflet (PIL) for Group A and Audio-Visual Aids along with PIL for Group B, were used through pharmacist intervention. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 26. **Results:** Group A showed moderately significant improvement in the practice domain ( $1.33 \pm 3.29$ ;  $p < 0.05$ ), though no statistical significance was seen in the knowledge and attitude domains. In Group B, the overall pre-post data showed statistically significant improvement in all three domains, with mean improvement scores of  $1.34 \pm 2.60$ ,  $0.77 \pm 1.88$  and  $3.71 \pm 2.78$  in the knowledge, attitude and practice domains, respectively. **Conclusion:** The study identified gaps in the knowledge and management of hypothyroidism among pregnant women, which increase the risks and complications during pregnancy. The audio-visual education modality was more effective in addressing these gaps compared to the written Patient Information Leaflet (PIL).

**Keywords:** Audiovisual Aids, Gestational Hypothyroidism, KAP (Knowledge, Attitude and Practice), Medication adherence, Patient Information Leaflets.

## Correspondence:

**Dr. Geetanjali Salimath**

Department of Pharmacy Practice,  
KLE College of Pharmacy, Belagavi,  
Karnataka, INDIA.

Email: geetanjalisalimath@klepharm.edu  
ORCID: 0009-0008-3286-6091

**Received:** 19-04-2024;

**Revised:** 03-05-2024;

**Accepted:** 05-07-2024.

## INTRODUCTION

Hypothyroidism during pregnancy poses significant risks to maternal and fetal health, affecting approximately 3-5% of pregnant women worldwide.<sup>1,2</sup> In India, studies have reported varying frequencies of maternal hypothyroidism, ranging from 1.2% to 67.0%.<sup>3,4</sup> Despite its prevalence, research indicates widespread misconceptions and inadequate knowledge among affected individuals regarding hypothyroidism symptoms, effects on pregnancy and medication adherence.<sup>5,6</sup>

This study aims to address these gaps through targeted educational interventions. The hypotheses tested include evaluating whether Patient Information Leaflets (PILs) and audiovisual aids can effectively improve Knowledge, Attitude and Practice (KAP) among gestational hypothyroid patients. PILs are designed

to provide comprehensive information on hypothyroidism symptoms, treatment and medication adherence, while audiovisual aids aim to enhance patient understanding through visual and auditory learning modalities.

The rationale for these specific interventions stems from evidence suggesting that tailored educational approaches can significantly enhance patient comprehension and adherence to medical recommendations.<sup>5,7</sup> By improving patient education and awareness, this study seeks to mitigate the adverse effects of hypothyroidism during pregnancy, particularly among populations with limited health literacy and in economically disadvantaged areas.

## MATERIALS AND METHODS

### Study Design and Setting

A prospective interventional study was conducted at a tertiary care hospital and medical research centre over six months (December 2021 to May 2022) in the Department of Gynaecology and Obstetrics.



DOI: 10.5530/jyp.2024.16.73

### Copyright Information :

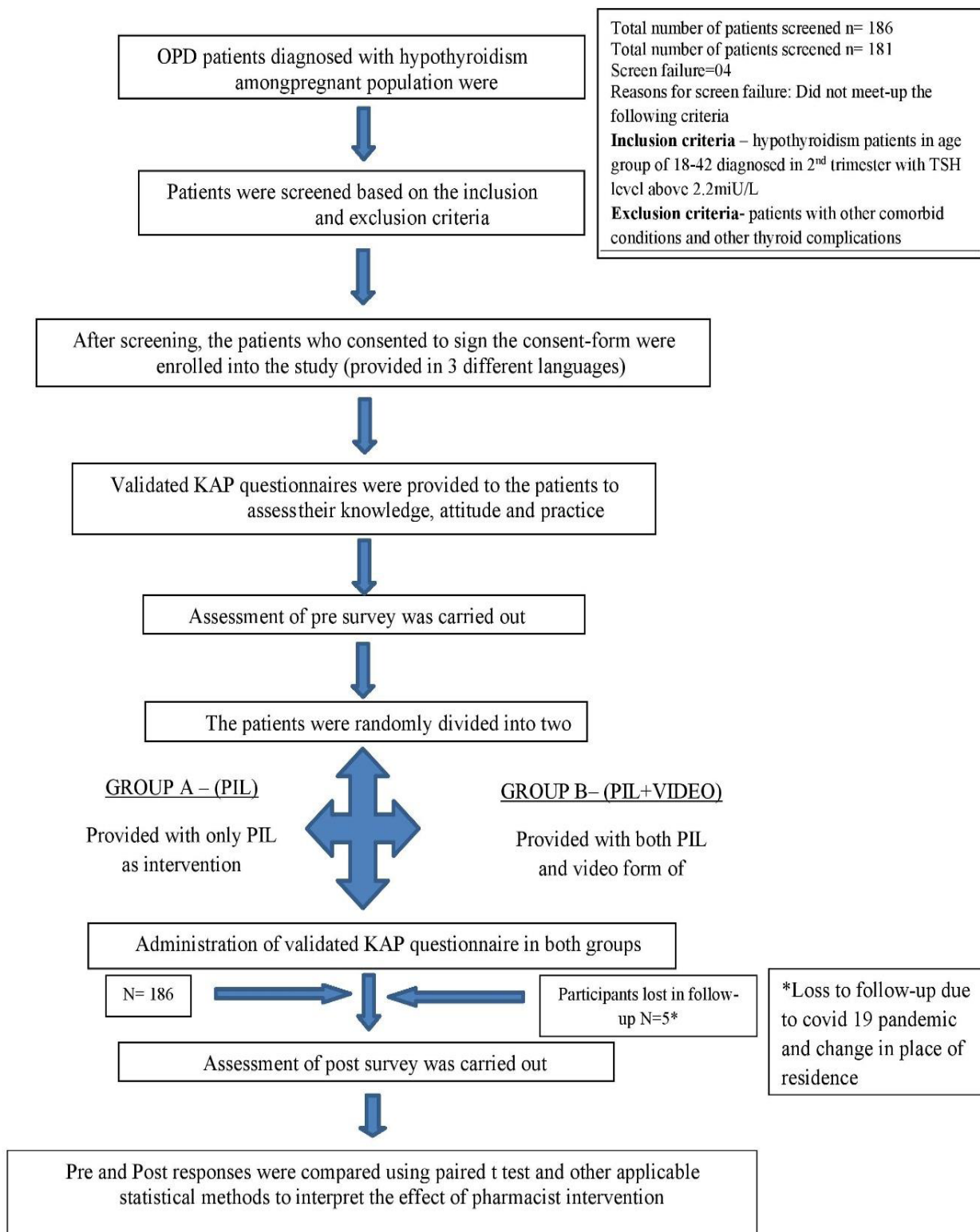
Copyright Author (s) 2024 Distributed under  
Creative Commons CC-BY 4.0

Publishing Partner : EManuscript Tech. [www.emanuscript.in]

## Participants

Pregnant women aged 18 to 45, diagnosed with hypothyroidism during gestation and receiving at least one medication, were

included in the study. After screening, the study's objectives were explained and voluntary written consent was obtained. A total of 186 participants were enrolled.



**Figure 1:** Study Flowchart for Assessment of Knowledge, Attitude, and Practice (KAP).

## Questionnaire

A validated questionnaire consisting of four domains was used: demographic details, knowledge (questions 1-11), attitude (questions 1-11) and practice (questions 1-14). The questionnaire was developed following a literature review and consultation with experts in pharmacy, endocrinology and obstetrics and gynaecology. It underwent intra- and inter-validation by a panel of seven experts using a Likert 7-point scale. Phase 1 involved intra-validation by primary practice experts and Phase 2 involved inter-validation by experts in endocrinology and obstetrics and gynaecology. Cronbach's alpha score was 0.962, indicating excellent reliability.

## Intervention

Participants were randomized into two groups using a computerized randomization method:

Group A: Received Patient Information Leaflets (PILs).

Group B: Received both PILs and audiovisual aids.

Educational materials provided during the pre-test assessment were aligned with the validated questionnaire data, covering the definition of hypothyroidism, symptoms, complications during pregnancy, medication and side effects, contraindications, ideal dosing times, dietary recommendations and lifestyle modifications. A pharmacist conducted the KAP assessments.

The primary outcome of the study was to observe the change from pre- to post-assessment in KAP through the questionnaires in the randomized groups. Group A received Patient Information Leaflets (PILs), while Group B received both PILs and audiovisual aids. Subsequently, a pharmacist conducted the KAP assessments as depicted in Figure 1 and the results were analyzed using statistical methods.

## Sample size Calculation

The sample size was calculated using the formula:

$$n = (Z_{1-\alpha})^2 \times SD^2 \times 1.1$$

$$(20\% \text{ of } SD)^2$$

$$n = (1.96)^2 \times (12.70)^2 \times 1.1$$

$$(20\% \text{ of } 13.58)^2$$

$$n = (1.96)^2 \times (12.70)^2$$

$$(2.716)^2$$

$$n = 779.29$$

$$7.37$$

$$n=84 \text{ participants per group}$$

Thus, the total sample required was 186 participants.

## Data Collection and Analysis

Data were collected using the validated questionnaires and entered into Excel sheets. Statistical analysis was performed using SPSS

**Table 1: Socio-demographic profiles of the study participants.**

Characteristics	Categories	Frequency (n=181)	Percentage (%)
Age in years	18-24	63	34.8
	25-32	106	58.6
	33-39	9	5.0
	40-46	3	1.7
Educational qualification	Uneducated	17	9.4
	Educated	5	2.8
	10 <sup>th</sup> pass	32	17.7
	12 <sup>th</sup> pass	104	57.5
	Undergraduate	21	11.6
	Postgraduate	2	1.1
Occupational status	Housewife	164	90.6
	Government jobs	10	5.52
	Daily wage worker	7	3.86

version 26. Descriptive statistics were used for socio-demographic details. The effectiveness of the interventions was assessed using the parametric paired t-test, with a significance level set at  $p < 0.05$  and a 95% confidence level.

### Scoring System

The KAP scores were categorized as follows:

Knowledge: Poor ( $\leq 4$ ), Good (5-9), Excellent (10-11),

Attitude: Negative ( $\leq 6$ ), Positive (7-11),

Practice: Poor ( $\leq 5$ ), Good (6-11), Excellent (12-14).

### Ethical Considerations

Ethical approval was obtained from the hospital's ethical committee [Ref. No. KLE/COP/2021-22/674]. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013).

### RESULTS

The study included pregnant participants aged between 18 and 46 years. Out of 186 screened participants, 5 were excluded for not meeting inclusion criteria, resulting in 181 participants being included in the study. The majority of participants were in the age group of 25-32 years (106; 58.6%), with only a few participants in the 40-46 age group (3; 1.7%). The 18-24 age groups was the second largest, comprising 63 participants (34.8%). Regarding education, most groups was the second largest, comprising 63 participants (34.8%). Regarding education, most participants (104; 57.5%) had completed 12<sup>th</sup> grade, while 21 (11.6%) had education beyond high school but had not completed a bachelor's degree. Only 2 participants (1.1%) had completed post-graduation and 17 (9.4%) reported no formal education. The majority of participants were housewives (164; 90.6%), with smaller numbers employed in government jobs (10; 5.52%) or as daily wage workers (7; 3.86%). as shown in Table 1.

Table 2 presents the participants' levels of knowledge, attitude and practice before and after the intervention. Participants responded to a close-ended questionnaire where "yes" earned 1 point and "no" or "I don't know" earned 0 points. The knowledge domain focused on the thyroid gland's location, the disease itself and its associated risk factors. Attitude questions gauged participants' perceptions of the disease, highlighting a significant belief in the positive impact of educating patients' families on patient well-being. Practice questions assessed awareness and adherence to physicians' written instructions, revealing notable instances where participants were unaware or followed incorrect practices. Notably, 54.4% of participants reported concurrent administration of LT4, calcium and iron medications.

Table 3 displays the Karl Pearson's correlation analysis results between the domains of Knowledge, Attitude and Practice (KAP)

and socio-demographic variables. A highly significant positive correlation was found among knowledge, attitude and practice ( $p < 0.001$ ): knowledge-attitude ( $r = 0.524$ ), attitude-practice ( $r = 0.654$ ) and knowledge-practice ( $r = 0.478$ ). Occupation and age did not correlate significantly with KAP. However, educational qualification showed a strong positive correlation with knowledge ( $r = 0.337$ ) and attitude ( $r = 0.309$ ) at  $p < 0.001$ . Additionally, a significant correlation was observed between educational level and practice ( $r = 0.253$ ,  $p < 0.05$ ).

### DISCUSSION

In our study, a constructed questionnaire underwent rigorous validation in two phases: internal and external. The validation process included a panel of six experts who utilized a 7-point Likert scale for scoring. The questionnaire demonstrated excellent reliability with a Cronbach's alpha score of 0.962, indicating high internal consistency (Bipin Sethi *et al.*, 2023).<sup>8</sup> This validation process ensures the robustness of our tool in assessing the Knowledge, Attitude and Practice (KAP) of pregnant women regarding hypothyroidism.

Our interventional study aimed to evaluate the impact of clinical pharmacist intervention on KAP related to hypothyroidism among pregnant women attending the antenatal clinic at KLE Dr. Prabhakar Kore Hospital. Hypothyroidism during pregnancy poses significant risks and complications if not managed correctly, highlighting the importance of improving patient knowledge and management practices (Iskandar Idris *et al.*, 2022).<sup>9</sup>

Initially, our findings indicated a notable lack of knowledge among participants regarding hypothyroidism and its implications. Only 48.6% of participants demonstrated good knowledge about the disorder and awareness of its effects on menstruation was low at 46.91% (Jitsupa Khamsingnork *et al.*, 2022).<sup>10</sup> Despite this, a majority of participants (74.06%) exhibited a positive attitude toward disease management, with a high percentage (86.41%) expressing interest in regular testing for thyroid diseases during pregnancy (P Maheshwari *et al.*, 2021).<sup>11</sup>

Practice behaviors, however, showed room for improvement, with only 44.2% of patients exhibiting positive responses initially. Few patients sought information from healthcare providers (20.64%) or adhered to a prescribed diet plan (25.79%), underscoring the need for targeted educational interventions (Jitsupa Khamsingnork *et al.*, 2022).<sup>10</sup>

Our study focused on resolving these gaps through pharmacist intervention and counseling, aiming to enhance health outcomes by improving disease understanding and management. Similar studies have highlighted the critical role of education in addressing knowledge deficits and improving treatment adherence among patients with thyroid disorders (Jitsupa Khamsingnork *et al.*, 2022; P Maheshwari *et al.*, 2021).<sup>10,11</sup>

**Table 2: Level of Knowledge, Attitude and Practice - Pre- and Post-Intervention.**

Knowledge	Group A			Group B		
	Pre	Post	Sig	Pre	Post	Sig
1. Do you know the thyroid gland is a butterfly-shaped gland that is found in the neck?	34.56%	51.85%	0.656≥0.05	32.92%	95%	0.001≤0.05
2. Do you know hypothyroidism is a medical disorder characterized by low thyroid levels?	58.02%	83.95%		43.90%	97.5%	
3. Do you know cold intolerance is a symptom of hypothyroidism?	28.39%	34.56%		36.58%	96.25%	
4. Do you know hypothyroidism makes you tired?	51.85%	35.80%		54.87%	97.5%	
5. Do you know muscle pains are a symptom of hypothyroidism?	35.80%	34.56%		43.90%	98.75%	
6. Do you know menstruation can be affected by hypothyroidism?	29.62%	46.91%		30.48%	92.5%	
7. Do you know levothyroxine should be taken on empty stomach?	98.76%	97.53%		90.24%	100%	
8. Do you know hypothyroidism can be caused by a lack of iodine?	38.27%	74.07%		40.24%	96.25%	
9. Do you know that TSH levels in the blood are used to detect hypothyroidism?	86.41%	83.95%		71.95%	96.25%	
10. According to you is hypothyroidism curable?	51.85%	28.39%		35.36%	90%	
11. Do you know that patients with hypothyroidism are more likely to develop depression?	41.97%	40.74%		34.14%	93.75%	
Attitude	Group A			Group B		
	Pre	Post	Sig	Pre	Post	Sig
Hypothyroidism in pregnant women should be tested on a regular basis.	90.12%	86.41%	0.067≥0.05	89.02%	96.25%	0.00≤0.05
Hypothyroidism is a serious problem for pregnant women over the age of 35.	44.44%	50.61%		45.12%	92.5%	
Women who are pregnant and have a family history of hypothyroidism should get checked.	61.72%	62.96%		62.19%	93.75%	
Only after consultation should hypothyroidism treatment is started.	88.88%	79.01%		92.68%	97.5%	
Do you believe that patients' family members should also be educated?	92.59%	91.35%		91.46%	96.25%	
Do you believe that taking drugs after being diagnosed with hypothyroidism is necessary?	79.10%	64.19%		82.92%	98.75%	
Do you think taking prescribed medications regularly can reduce hypothyroidism?	72.83%	74.04%		74.39%	100%	



Knowledge	Group A			Group B		
	Pre	Post	Sig	Pre	Post	Sig
Do you believe that teaching pregnant women during their first trimester will help them reduce their risk of hypothyroidism?	82.71%	80.24%		81.70%	98.75%	
Do you believe that educating pregnant women about hypothyroidism will increase medication compliance?	86.41%	83.95%		84.14%	100%	
Do you believe that pregnant women should be tested for hypothyroidism on a regular basis?	81.48%	76.54%		80.48%	98.75%	
Do you believe pregnant women with hypothyroidism should follow a special diet?	34.56%	51.85%		30.48%	100%	
Practice	Group A			Group B		
	Pre	Post	Sig	Pre	Post	Sig
Do you use hypothyroidism medicine on a daily basis?	82.71%	93.87%	0.067≥0.05	85.36%	98.75%	0.00≤0.05
After learning about hypothyroidism, did you seek your doctor for further information?	23.45%	38.27%		18.29%	91.25%	
Certain medications should be avoided because they raise the risk of hypothyroidism.	44.44%	75.30%		32.98%	98.75%	
Do you eat more after consuming medication?	54.32%	66.66%		48.78%	97.5%	
Do you take your pills 30-60 minutes before breakfast?	80.24%	87.65%		80.48%	97.5%	
Do you exclude cabbage, cauliflower, or soya in your diet?	27.16%	43.20%		23.17%	97.5%	
Do you test TSH on a regular basis as directed by your doctor?	83.95%	71.60%		80.48%	97.5%	
Do you follow any special diet to reduce your chances of developing hypothyroidism?	30.86%	46.91%		20.73%	98.75%	
Do you look for more information for better control of hypothyroidism?	34.56%	12.28%		19.51%	85%	
Do you minimize side effects of medication yourself?	9.87%	7.40%		2.43%	100%	
Do you try to resolve doubts regarding medications yourself?	33.33%	61.72%		40.24%	65%	
Do you adhere to your doctor's advice?	77.77%	80.24%		76.82%	98.75%	
Are you familiar with hypothyroidism treatment options?	32.09%	14.81%		29.26%	98.75%	
Do you use levothyroxine with iron and calcium supplements?	26.62%	30.86%		39.02%	56.25%	

**Table 3: Karl Pearson's Correlation between KAP and Socio-Demographic Details.**

		knowledge	Attitude	Practice	occupation	Age in years	educational qualification
knowledge	Pearson Correlation	1	.524**	.478**	.151	.092	.337**
	Sig. (2-tailed)		.000	.000	.157	.387	.001
	N	90	90	90	90	90	90
Attitude	Pearson Correlation	.524**	1	.456**	.125	.034	.309**
	Sig. (2-tailed)	.000		.000	.240	.747	.003
	N	90	90	90	90	90	90
Practice	Pearson Correlation	.478**	.456**	1	.044	-.028	.253*
	Sig. (2-tailed)	.000	.000		.680	.794	.016
	N	90	90	90	90	90	90

Concerns regarding medication safety during pregnancy were prevalent among participants, with many expressing the need for comprehensive counseling beyond dosage instructions (Iskandar Idris *et al.*, 2022).<sup>9</sup> Statistically significant improvements in knowledge were observed post-intervention, validating the effectiveness of pharmacist-led educational initiatives (P Maheshwari *et al.*, 2021).<sup>11</sup>

Our study also aimed to mitigate maternal and neonatal complications associated with hypothyroidism during pregnancy. Maternal complications included a high rate of caesarean deliveries (60.74%), which aligns with findings indicating increased risks of preterm delivery and caesarean sections in hypothyroid pregnancies (Iskandar Idris *et al.*, 2022).<sup>9</sup>

Neonatal complications, such as NICU admissions (14.91%) and diagnoses of jaundice and neonatal hypothyroidism, underscored the need for improved maternal health management strategies (Iskandar Idris *et al.*, 2022).<sup>9</sup>

Furthermore, our study established a moderate to positive correlation between education levels and KAP scores (Pearson's coefficient=0.44,  $p<0.05$ ), highlighting education as a significant determinant of patient outcomes (Bipin Sethi *et al.*, 2023).<sup>8</sup> Conversely, age showed a weak to negligible correlation with KAP levels, suggesting that educational interventions may be more impactful than age in improving patient understanding and practices.

Comparative analysis using paired t-tests revealed varying effectiveness between educational modalities, with PILs alone showing less significant improvement compared to combined PILs and audiovisual aids. This finding underscores the

importance of multimodal educational approaches in enhancing patient learning and engagement (Bipin Sethi *et al.*, 2023).<sup>8</sup>

## CONCLUSION

In conclusion, our study supports the pivotal role of pharmacist-led interventions in improving KAP and reducing complications associated with hypothyroidism during pregnancy. By addressing knowledge gaps, enhancing attitudes and promoting better practices, pharmacist interventions can significantly improve maternal and neonatal health outcomes. Future research should further explore optimized educational strategies and their long-term impacts on patient management in diverse healthcare settings.

This discussion synthesizes findings from various studies, emphasizing the collaborative effort needed to enhance patient care through effective educational interventions in hypothyroidism management during pregnancy.

## ACKNOWLEDGEMENT

We thank the Medical Director and Superintendent of KLE's Dr. Prabhakar Kore Hospital and MRC, Belagavi, the Principals of J.N. Medical College and KLE College of Pharmacy and the Head of Obstetrics and Gynaecology at KLE's Dr. Prabhakar Kore Hospital for their support. Special thanks to Dr. Anita Dadi Dalal, Professor and Head of OBG and Gynaecology, for her assistance. We also acknowledge the panel of experts for their input in validating the questionnaires, including Dr. Anjali Joshi, Dr. Shruti, Dr. Farzana and Dr. Vikrant B. Ghatnatti.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ABBREVIATIONS

**PIL'S:** Patient Information Leaflet's; **OBG:** Obstetrics and Gynecology; **KAP:** Knowledge, Attitude, Practice; **NICU:** Neonatal Intensive Care Unit; **SPSS:** Statistical package for Social Science.

## REFERENCES

1. Yadav V, Dabar D, Goel AD, Bairwa M, Sood A, Prasad P, *et al.* Prevalence of hypothyroidism in pregnant women in India: a meta-analysis of observational studies. *J Thyroid Res.* 2021; 2021:5515831. doi: 10.1155/2021/5515831, PMID 33680424.
2. Smallridge RC, Ladenson PW. Hypothyroidism in pregnancy: consequences to neonatal health. *J Clin Endocrinol Metab.* 2001;86(6):2349-53. doi: 10.1210/jcem.86.6.7577, PMID 11397821.
3. Krassas GE, Poppe K, Glinoer D. Thyroid function and human reproductive health. *Endocr Rev.* 2010;31(5):702-55. doi: 10.1210/er.2009-0041, PMID 20573783.
4. Khadilkar S. Thyroid-stimulating hormone values in pregnancy: cutoff controversy continues? *J Obstet Gynaecol India.* 2019;69(5):389-94. doi: 10.1007/s13224-019-01272-w, PMID 31598039.
5. Carney LA, Quinlan JD, West JM. Thyroid disease in pregnancy. *Am Fam Phys.* 2014;89(4):273-8. PMID 24695447.
6. Kiran Z, Sheikh A, Malik S, Meraj A, Masood M, Ismail S, *et al.* Maternal characteristics and outcomes affected by hypothyroidism during pregnancy (maternal hypothyroidism on pregnancy outcomes, MHPO-1). *BMC Pregnancy Childbirth.* 2019;19(1):476. doi: 10.1186/s12884-019-2596-9, PMID 31805890.
7. Stagnaro-Green A, Abalovich M, Alexander E, Azizi F, Mestman J, Negro R, *et al.* Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and postpartum. *Thyroid.* 2011;21(10):1081-125. doi: 10.1089/thy.2011.0087, PMID 21787128.
8. Sethi B, Khandelwal D, Vyas U. A cross-sectional survey to assess knowledge, attitude and practices in patients with hypothyroidism in India. *Thyroid Res Pract.* 2018;15(1). doi: 10.4103/trp.trp\_25\_17.
9. Idris I, Srinivasan R, Simm A, Page RC. Maternal hypothyroidism in early and late gestation: effects on neonatal and obstetric outcome. *Clin Endocrinol (Oxf).* 2005;63(5):560-5. doi: 10.1111/j.1365-2265.2005.02382.x, PMID 16268809.
10. Khamsingnork J, Chongsomchai C, Kuchaisit C, Lumbiganon P. Knowledge, attitude and practice regarding iodine deficiency disorder among pregnant women at Srinagarind hospital, Khon Kaen, Thailand. *Thai J Obstet Gynaecol.* 2016:255-64.
11. Maheshwari P, Mohan R, Shanmugarajan TS. KAP study on thyroid disorders (hypothyroidism and hyperthyroidism) in a tertiary care hospital. *Res J Pharm Technol.* 2017;10(1):41-3. doi: 10.5958/0974-360X.2017.00010.5.

**Cite this article:** Wakkundmath GJ, Lacerda M, Ajit RA, Yusuf N, Salimath G. Assessing the Impact of Clinical Pharmacist Led Education Modality Towards Knowledge, Attitude and Practice (KAP) among Gestational Hypothyroid Patients. *J Young Pharm.* 2024;16(3):586-93.