

# Impact of Pharmacist Intervention on Improving Knowledge, Attitude and Practice among Hypothyroid Patients

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## ABSTRACT

**BACKGROUND** Hypothyroidism causes considerable morbidity. Lack of awareness can lead to poor disease management. This study aimed to investigate the effect of pharmacist-provided counselling in terms of knowledge, attitude, and practice outcomes in hypothyroid patients.

**METHODS** This was a prospective interventional study conducted in a tertiary care hospital of Nepal from September 2019 to February 2020. Based on the inclusion and exclusion criteria, a total of 94 hypothyroid patients were enrolled in this study. Simple Random sampling technique was used. The study population was divided into a test group and control group. The knowledge, attitude, and practice of patients regarding hypothyroidism were assessed and recorded at baseline using questionnaire and counselling was done. After one-month follow-up patients were again assessed using same questionnaire. Data was analyzed using Statistical Package for the Social Sciences version 25.

**RESULTS** The mean knowledge, attitude, and practice scores before intervention of the test group were  $6.16 \pm 2.14$ ,  $18.90 \pm 2.29$  and  $4.53 \pm 1.12$  respectively, and these scores were changed to  $12.48 \pm 1.53$ ,  $22.04 \pm 0.92$  and  $6.00 \pm 0.00$  respectively, after the intervention ( $p < 0.05$ ). Likewise, the mean knowledge, attitude, and practice scores of the control group at baseline were  $8.90 \pm 3.69$ ,  $18.85 \pm 2.01$  and  $4.71 \pm 1.29$  respectively, and after one-month follow-up the mean scores were changed to  $7.88 \pm 0.77$ ,  $11.50 \pm 1.59$  and  $4.40 \pm 0.76$  respectively.

**CONCLUSION** The pharmacist-provided counselling is useful in enhancing the knowledge, attitude, and practice of hypothyroid patients.

**KEYWORDS:** Hypothyroidism; Intervention; knowledge; attitude; practice

## BACKGROUND

Hypothyroidism is a widespread chronic endocrine disorder with a varied clinical presentation ranging from overt myxedema, end-organ symptoms, and multisystem failure to asymptomatic or subclinical hypothyroidism with normal thyroxine and triiodothyronine levels and moderately elevated serum thyrotropin levels. Hypothyroidism is more common in women, particularly during puberty, menarche, pregnancy, the first six months after giving birth, and menopause.<sup>1</sup> Globally, the percentage of the patient with hypothyroidism varies from 1-10%. It is one of the commonest endocrine disorders seen elderly women. Thyroid dysfunction is one of the commonest non-communicable diseases seen in Nepal, affecting about 30% of the population in the eastern region of the country.<sup>2</sup> Hypothyroidism is a common thyroid disorder whose incidence and pattern are influenced by socioeconomic, regional, and environmental factors.<sup>3</sup>

There is a lack of knowledge and misconceptions regarding the thyroid gland and its disorders in the population in Nepal. As education is one of the most important factors that determine awareness, hence, the present study aimed to investigate whether a person's education, age, and gender influence awareness about the thyroid gland, its disorders and the management of its dysfunction. In every chronic condition, the patients' knowledge and understanding of the disease and its treatment are critical for adequate compliance and a positive long-term outcome. Studies have shown the importance of improving patient's knowledge through education and the associated benefits

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of improving compliance with health-care appointments and medications for patients with hypertension and diabetes.<sup>4</sup> In Nepal, awareness about of hypothyroidism is inadequate because of lack of knowledge about the disorder and medication used for treating it.

Pharmacists are well prepared to address this therapeutic gap by recognizing and addressing the common factors that influence drug therapy, such as drug interactions, the impact of common co-morbid conditions, administration timing, and drug formulation accuracy. Pharmacists can make a dramatic difference in treatment success by educating the patient and monitoring the adherence.<sup>5</sup>

Although hormone replacement therapy is not so expensive, under and over treatment is common among the patients and profound effects on various organs such as cardiovascular system, endocrine system, nervous system, and brain have been observed. So, education regarding hypothyroidism is a critical move that necessarily involves a health care team to provide the best possible care for the patient, with the pharmacist playing a key role.<sup>6</sup>

Pharmacists can play an important role in achieving positive therapeutic outcomes by motivating patients to adhere to the treatment. Patients may receive verbal or written counselling about drugs, instructions for use, and guidance on side effects, storage, and diet and lifestyle modifications. A Patient Information Leaflet (PIL) prepared by the manufacturer or pharmacist may be helpful and is a commonly understood method of patient education.<sup>7</sup>

The Knowledge, Attitude, and Practice (KAP) survey is a quantitative method that tests these domains in a predefined population using a standardized questionnaire. A KAP survey documents an "opinion" and is focused on a "declaration" (i.e., statement). Hence, this study was done to assess the effectiveness of counselling on hypothyroid patients in terms of KAP outcomes in a tertiary care hospital of Nepal.

## METHODOLOGY

This is a prospective interventional study conducted among 94 subjects attending Medicine OPD (Out- Patient Department) of Universal College of Medical Sciences and Teaching Hospital (UCMS-TH), situated at Ranigaun, Bhairahawa, Rupandehi, Nepal for a period of six months from September 2019 to February 2020. This study was conducted after receiving ethical approval from Institutional Review Committee of UCMS-TH with the reference number (Ref. No. UCMS/IRC/150/19) and Helsinki Ethical Guidelines were followed. Written consent was taken after explaining about research objectives and procedure to patients, and data were collected using valid semi-structured questionnaire.<sup>8</sup> Hypothyroid patients of the age range 16-

75 years who were willing to give informed consent were included in the study, whereas psychiatric and hospitalized patients with thyroid dysfunction were excluded from the study. The patients were randomly divided into two groups i.e. test group and control group by simple block randomization technique.

The sample size was calculated based on a similar study conducted in Kathmandu University, Dhulikhel, Nepal.<sup>9</sup> The formula for calculating the sample size is given below:

A validated KAP questionnaire was used to carry out the study. Socio-demographic parameters of patients such as

Where,

$n$  = sample size in each of the groups

SD = Standard deviation = from previous studies or pilot study [9]

$Z_{\alpha/2} = Z_{0.05/2} = Z_{0.02} = 1.96$  (From Z table) at type 1 error of 5%

$Z_{\beta} = Z_{0.20} = 0.842$  (From Z table) at 80% power

$d^2$  = effect size = difference between mean values

$$n = 2 \times \frac{(1.11762)^2 (1.96 + 0.842)^2}{(0.6451)^2} = 47.129$$

= 47 (in one group)

gender, age, and educational qualification were included in the questionnaire, followed by knowledge, attitude, and practice questions.<sup>10</sup> There were a total of 31 questions:

- treatment of hypothyroidism. The responses were captured as true or false.
- For attitude, 5 questions to assess the attitude of the patient towards their disease and treatment. A 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree) was used to rank the responses and
- For practice, 8 questions regarding practices required a "Yes" or "No" response to indicate if the patients pursue a particular recommended practice.

## Scoring method

- For knowledge, each correct answer was scored as one (1) and for an incorrect answer as zero (0).
- For attitude, questions were measured by using a 5 point Likert scale where the patient level of agreement towards the given statement was checked. Each question was scored as five (5) for the greatest level of agreement (strongly agree), zero for the lowest level of agreement (strongly disagree), and others in between 1 and 5.

- For practice questions, adhering to the guidelines for disease management or instructions from the patient's health care provider was merited a score of one (1) while non-adherence was scored as zero (0).

After obtaining the consent of the patients, a patient's interview was conducted using the KAP questionnaire. Demographic data were collected. Baseline KAP scores were noted and accordingly in both groups, patient counselling was done. Patient was educated about 20 minutes about the disease, its management, and complications with the help of patient information leaflet (PIL) to the test group. Further follow-up was done after one month in both groups of patient on follow-up visit or telephonically for their review and KAP score of patients was again measured. The obtained scores were noted and the pre-and post-results were compared. Similarly, the improvement in their knowledge, attitude, and practice before and after patient counselling was assessed.

## RESULTS

### Demographic Attributes

A total of 94 patients were enrolled in the study, but only 85 were able to complete the study. The response rate was 90.4%. Remaining 9 patients lost follow-up (4 patients lost follow-up in the test group and 5 patients lost follow-up in the control group). Majority of the patients (38; 44.7%) were found in the age group of 36–55 years. The study showed that (20; 23.5%) male and (65; 76.4%) female patients were found in the study after follow-up. The study found that (31; 36.3%) patients had no formal education (i.e., illiterate), (32; 37.4%) patients were educated up to primary, (13; 15.5%) patients had education up to high school, (8; 9.5%) patients were educated up to pre-university and (1; 1.2%) had education up to degree level. The details of demographic attributes is illustrated in Table 1.

### Mean score KAP about hypothyroidism of test group and control group

The mean knowledge score of the test group before intervention was  $6.16 \pm 2.14$  and after intervention  $12.48 \pm 1.53$ , significantly higher than that before intervention ( $p$  value  $< 0.001$ ). Similarly, the mean attitude score changed from  $18.90 \pm 2.29$  to  $22.04 \pm 0.92$  after the intervention ( $p$  value  $< 0.001$ ). The mean practice score of the test group increased from  $4.53 \pm 1.12$  to  $6.00 \pm 0.00$  following intervention, also significantly higher compared to the score before intervention ( $p$  value  $< 0.001$ ). Although the knowledge score increased from  $8.90 \pm 3.69$  to  $7.88 \pm 0.77$  in the control group patients, the change was not statistically significant ( $p$  value = 0.066). The changes in baseline and post-follow-up attitude scores  $18.85 \pm 2.01$  to

$11.50 \pm 1.59$  were statistically significant ( $p$  value = 0.001) due to some misconceptions during taking the data. There was no separate place for counselling so it was conducted at open place outside Out Patient Department, so the patients in the control group might have been aware of it and have been influenced which result in significant change in attitude score among control group as well. In Nepal, communication between a people on matters related to health and social issues is common. So, there might be the sharing of information between the people in the test group with control group as well. The analysis of practice scores  $4.71 \pm 1.29$  to  $4.40 \pm 0.76$  also showed that the changes at baseline and post-follow-up scores were not statistically significant ( $p$  value = 0.146) (Table 2).

### Association of Demographic factors with KAP for hypothyroidism.

Hence, there is no significant association between gender with knowledge regarding hypothyroidism. The mean knowledge score of male patients was greater than the female patients in both groups (i.e., test and control group). There is no significant association between age with knowledge in both groups. The mean knowledge score of the age group (36–55) was greater than the other two groups in the control group. However, the mean knowledge was seen to be relatively the same in all age groups in the test group. There is a significant association between educations with knowledge. The mean knowledge score of educated patients (i.e. primary) was greater than the uneducated (illiterate) patients in the test group. There is no significant association between education with knowledge. The mean knowledge score of educated patients was greater than the uneducated (illiterate) patients in the control group. This is clearly shown in Table 3.

There is a significant association between gender with attitude. The mean score of attitude of female patients was greater than the male patients in the test group. However, there is no significant association between gender with attitude. The mean score of attitude of male patients was greater than the female patients in the control group. There is no significant association between age with attitude in both groups. The mean score of attitude in age group 36–55 was greater than the other two age groups in the test group. However, the mean score of attitude in age group 56–75 had greater than the other two age groups in this group. Hence, there is a significant association between education with attitude in both groups. The mean score of attitude was greater in high educated patients than in primary and illiterate patients in both groups. This is clearly illustrated in the Table 4.

There is no significant association between gender with practice regarding hypothyroidism in the control group.

The mean score of practice in both patients (i.e., male and female) was relatively the same in control group. However, in the test group there was no significant difference between gender with the mean score of practice. There is no significant association between age with practice. The mean score of practice of all age groups of patients was relatively the same with controls. However, in the test group there was no significant difference between gender with the mean score of practice. Hence, there is a significant association between education with practice in the control group. However, in the test group there was no significant difference between education with the mean score of practice. The association odd demographic variables with practice in both the groups after intervention is shown in the Table 5.

## Discussion

This study primarily assessed the knowledge, attitude, and practice (KAP) among hypothyroid patients and the impact of the intervention on them. Pharmacist mediated counselling about hypothyroidism definition, location of the gland, symptoms, causes, risk groups, familial predisposition, curability, endocrinologist consultation, thyroid function test interpretation, avoiding foods, time of drug administration, had shown a good improvement in knowledge, attitude, and practice at individual parameter levels.

The number of female patients enrolled in this study, 65, was higher than the number of male patients' (i.e., 20 patients). Hypothyroidism was commonly seen in female population than in male population mainly because of the effect of female hormonal imbalance. Birth control pills, pregnancy, and postmenopausal estrogen supplementation are used by women, increasing the levels of Thyroxine-binding globulin (TBG) and decreasing the free thyroxine in circulation. While, the male hormone testosterone has no effect on thyroxine-binding globulin (TBG) and actually stimulates the conversion of the inactive thyroid hormone, T4, to the active thyroid hormone, T3, within the cells.<sup>11</sup>

Most of the patients belonged to the age group of 36-55 years. The findings were supported by a case-control study conducted in Nepal, where the age group of patients was 35-45 years [4]. And the findings were also supported by a case-control study conducted in India, where the age group of patients was between 40-49 years.<sup>12</sup>

The findings of the study showed that there was a poor baseline meaning KAP levels among patients with hypothyroidism, which are similar to a cross-sectional study conducted in Delhi.<sup>13</sup> This is due to the majority of the patients were illiterate (36.3%) and primary level (37.4%)

The knowledge levels in this study are very low compared

to the knowledge results of the multi-centric study conducted in India.<sup>14</sup> After delivery of counselling about hypothyroidism and its management, most of the patients had shown a significant improvement in the answering of knowledge-related questions with a  $P < 0.0001$ .

This study findings revealed that less than half of the respondents had the right attitude towards hypothyroidism and its management. After the pharmacist delivered counselling, there was a significant ( $P < 0.0001$ ) improvement in positive attitudes towards various aspects like consultation with a doctor requires getting better patient care, self-dose adjustment was not advised; taking thyroid tablets should never stop without consulting doctors. A similar type of elevated positive attitude levels were also observed in the pharmacist intervention study conducted among hypothyroidism patients attending the endocrine clinic of Nepal in 2014.<sup>9</sup>

Education is an indicator of the knowledge that the patient has regarding the disease conditions. The overall percentage of educated patients was found to be low in the present study. However, the association between knowledge, attitude, and practice with education was found to be significant.

## CONCLUSION

Pharmacist mediated patient counselling has shown a positive effect on patient's KAP towards hypothyroidism and its management. Therefore, there is a wide need of providing counselling and educational programs to resolve misconceptions and wrong practices present in the minds of patients about hypothyroidism. This study has given an initiation to promote the implementation of educational programs towards hypothyroid patients. This study aims to improve the KAP towards hypothyroidism and its management; most of the hypothyroidism patients benefited by resolving their misbeliefs. Negative attitudes and wrong practices have changed in positive direction after delivery of counselling to the test groups.

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## CONFLICT OF INTEREST

The authors declared no conflict of interest.

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None

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Table 1. Patient demographic variables.

Variables	Test Group		Control Group		Total(%)
	Frequency	Percentage	Frequency	Percentage	
<b>Age</b>					
16-35	7	16.3	18	42.9	25(29.6)
36-55	20	46.5	18	42.9	38(44.7)
56-75	16	37.2	6	14.2	22(25.7)
<b>Gender</b>					
Male	9	20.9	11	26.2	20(23.5)
Female	34	79.1	31	73.8	65(76.4)
<b>Education</b>					
Illiterate	20	46.5	11	26.2	31(36.3)
Primary	23	53.5	9	21.4	32(37.4)
High school	0	0	13	31.0	13(15.)
Pre-university	0	0	8	19.0	8 (9.5)
Degree	0	0	1	2.4	1 (1.2)

Table 2. Comparison of KAP scores of test group and control group.

Test Group			
Category	Mean score at baseline	Mean score after intervention (one month interval)	P-value
Knowledge score	6.16 ± 2.14	12.48 ± 1.53	0.001
Attitude score	18.90 ± 2.29	22.04 ± 0.92	0.001
Practice score	4.53 ± 1.12	6.00 ± 0.00	0.001
Control group			
Category	Mean score at baseline	Mean score after intervention (one month interval)	P-value
Knowledge score	8.90 ± 3.69	7.88 ± 0.77	0.066
Attitude score	18.85 ± 2.01	11.50 ± 1.59	0.001
Practice score	4.71 ± 1.29	4.40 ± 0.76	0.146



Table 3. Association of demographic variables with knowledge in the test and control groups after intervention.

Test Group				
Demographic variables	Number	Mean	Standard deviation	P value
<b>Gender</b>				
Male	9	13.11	0.33	0.174
Femal	34	12.32	1.68	
<b>Age-Group</b>				
16-35	7	12.71	1.38	0.828
36-55	20	12.55	1.90	
56-75	16	12.31	1.07	
<b>Education</b>				
Illiterate	20	11.10	0.447	0.001
Primary	23	13.69	1.019	
Control group				
<b>Gender</b>				
Male	11	8	8	0.55
Female	31	7.83	7.83	
<b>Age-Group</b>				
16-35	18	7.72	0.89	0.43
36-55	18	8.05	0.72	
56-75	6	7.83	0.40	
<b>Education</b>				
Illiterate	11	6.45	1.21	0.291
Primary	9	7.11	0.33	
High-School	13	8.92	0.64	
Per-University	8	8.12	0.35	
Degree	1	8.00		

Table 4. Association of demographic variables with attitude in the test and control groups after intervention.

Test Group				
Demographic variables	Number	Mean	Standard deviation	P value
<b>Gender</b>				
Male	9	21.00	0.00	0.001
Female	34	22.32	0.84	
<b>Age-Group</b>				
16-35	7	12.71	0.95	0.828
36-55	20	22.40	0.75	
56-75	16	21.75	1.00	
<b>Education</b>				
Illiterate	20	20.90	0.44	0.001
Primary	23	13.69	0.47	
Control group				
<b>Gender</b>				
Male	11	12	1.00	0.231
Female	31	11.32	1.73	

<b>Age-Group</b>				
16-35	18	11.33	1.71	0.686
36-55	18	11.50	1.72	
56-75	6	12.00	0.63	
<b>Education</b>				
Illiterate	11	9.72	1.55	0.001
Primary	9	11.88	0.60	
High-School	13	12.53	1.33	
Per-University	8	13.75	0.88	
Degree	1	13.00		

Table 5. Association of demographic variables with practice in the test and control groups after intervention.

<b>Test Group</b>				
<b>Demographic variables</b>	<b>Number</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>P value</b>
<b>Gender</b>				
Male	9	13.11	0.00	0.513
Femal	34	12.32	0.00	
<b>Age-Group</b>				
16-35	7	6.00	0.00	-
36-55	20	6.00	0.00	
56-75	16	6.00	0.00	
<b>Education</b>				
Illiterate	20	6.00	0.00	-
Primary	23	6.00	0.00	
<b>Control group</b>				
<b>Gender</b>				
Male	11	4.27	0.646	0.513
Female	31	4.45	0.809	
<b>Age-Group</b>				
16-35	18	4.27	0.66	0.549
36-55	18	4.44	0.92	
56-75	6	4.66	0.51	
<b>Education</b>				
Illiterate	11	2.54	0.52	0.001
Primary	9	3.66	0.86	
High-School	13	4.69	0.48	
Per-University	8	5.00	0.53	
Degree	1	5.00		