

Knowledge of thyroid disorder and preventive practice among pregnant women attending selected maternal and child health clinic of Bhaktapur, Nepal

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ABSTRACT

Background: Thyroid is the second most common endocrine illness after diabetes. Both hyperthyroidism and hypothyroidism can cause serious complications such as hypertension, coronary artery disease, infertility, arrhythmia, and more. This study aimed to determine the level of awareness among a group of people in the central region of Nepal.

Objectives: The overall objective of this study was to assess the knowledge of thyroid disorder and its preventive practices among pregnant women attending MCH clinic.

Methods: A cross-sectional analytical study was conducted among 207 pregnant women of age 18-29 years attending maternal and child health clinic of Siddhi Memorial Hospital, Bhaktapur through a pre-tested structured questionnaire. Quantitative research method was applied through face-to-face interview and the collected data were entered and analysed using SPSS v.25.

Results: Around 86% of 207 respondents had heard about thyroid disorder. Thyroid illness was defined by more than a third of respondents (38.76%) as the presence of Goiter, followed by disease caused by insufficient thyroid hormone (18.54%) and disease caused by excess thyroid hormone (12.92 %). 68.54% of those surveyed were uninformed about various thyroid issues, while 31.46% did. Only 62.92% of respondents were aware of the thyroid test, and the majority (81.15%) were not familiar with preventive practices. Overall, 65.2% of respondents had inadequate knowledge about thyroid disorders, whereas 34.80% had acceptable level of knowledge. Ethnicity, occupation, and education level were statistically significantly associated with knowledge on Thyroid disorder (p-value < 0.05). Adequate knowledge was found to be associated with good in preventive practice (p-value <0.06).

Conclusion: The respondents had a low level of awareness about thyroid problem and its preventive measures. This study highlights the necessity of comprehensive health education and accessible, affordable health services covering wide range of issues regarding thyroid.

Keywords: Knowledge, Pregnant women, Preventive practices, Thyroid disorder

1. Introduction

Thyroid disease is a prevalent endocrine disorder, ranking as the second most common after diabetes. Alteration of Thyroid-Stimulating Hormone (TSH) with normal or abnormal free T3 and T4 hormone shows thyroid dysfunction [1]. It encompasses a spectrum of conditions, including hyperthyroidism and hypothyroidism, which can lead to severe complications such as hypertension, coronary artery disease, infertility, arrhythmias, and more [2]. The prevalence of thyroid disorder in men is about one-tenth that observed in women. Severe maternal hypothyroidism due to iodine deficiency or thyroid blocking agents may lead to cretinism in newborns if untreated [3].

Despite its widespread impact on health, there is a significant lack of awareness regarding thyroid disorders and their preventive measures, especially in certain regions of the world. It is estimated that 200 million people in worldwide have some form of thyroid disease (Thyroid Foundation of Canada) and most of them are assumed to be less aware about the condition [4]. Population studies indicated that 2-3% of all pregnant women will have undiagnosed

hypothyroidism [4, 5]. According to a study done in Selangor 48.3% of women exhibited poor knowledge and while 51.7% demonstrated good knowledge of thyroid disorder [6]. Thyroid disorders are particularly critical during pregnancy because they can have profound effects on both the mother's health and the development of the foetus [7].

This study seeks to address this research gap by focusing on the level of awareness among a specific group of individuals in Nepal's central region. Hence, the study was centred on pregnant women attending the Maternal and Child Health clinic at Siddhi Memorial Hospital in Bhaktapur, Nepal. In light of the results, this research aims to contribute valuable insights into the pressing need for improved thyroid education and healthcare services for pregnant women in Nepal's central region, ultimately promoting better maternal and child health outcomes.

2. Methods

2.1 Study area

This study employed a quantitative approach, conducting an analytical cross-sectional study in the Siddhi Memorial Hospital of Bhaktapur District where pregnant women attending MCH clinics were taken as study

units. The study started from the second week of August 2022 and ended in first week of April 2023.

2.2 Study population and eligibility criteria

All pregnant women of age 18-39 years who attended MCH clinic of Siddhi Memorial Hospital, Bhaktapur were included in the study whereas pregnant women under 18 years and above 39 years were excluded.

2.3 Sample size and sampling

Non-probability convenience sampling was used, with a sample size of 207, determined using the formula for sample size calculation. The sample size was determined using the formula for population at large developed by Cochran in 1963 which is $n = (Z^2 p q)/d^2$. According to a study conducted by Mahato RV et.al, the prevalence of thyroid dysfunction was 36% [1]. This led to the value of p, q, d being 0.36, 0.64 and 0.05 respectively at 95% confidence interval. So, the value of sample size was calculated to be 198 and with the addition of 10% non-response rate, the final sample size was estimated to be 207.

2.4 Data Collection

Structured questionnaire was used for data collection. Total 34 questions regarding thyroid disorder and preventive practices were developed. Symptoms of thyroid disorders, types of thyroid test, side effect of thyroid disorder at the time of pregnancy, source of information and preventive practices were multiple choice questions. Ideas and concept for questionnaire was taken from various related studies nationally and globally. Questionnaire was verified from the supervisor and Siddhi Memorial Hospital, Bhaktapur. After taking the consent, interview was done to collect data. Face to face interview was done at their waiting time in hospital. Structured questionnaire was used as data collection technique to collect data and was recorded. For pre-testing, the questionnaire was administered in 21 pregnant women of attending MCH clinic of Manmohan Memorial Hospital, Kathmandu. After pre-testing, the instrument tool was adjusted to meet the requirements. Internal consistency was tested using Cronbach's alpha, which was determined to be greater than 0.7, which was considered acceptable. The study ensured validity through a comprehensive literature review and the adoption of questions from previous studies. Questionnaire was double-checked and

verified by the research supervisor and research authorities of Siddhi Memorial Hospital.

2.5 Data Analysis

The collected data was organized, coded, and entered in SPSS V.22.0 and MS-excel 2007. Univariable analysis calculated percentages for each category of variables, while bivariate analysis determined the associations between independent and dependent variables through cross-tabulation. The findings were presented using charts, tables, and graphs, and the results were disseminated through research presentations within the college and submission of the research report to the Institutional Review Committee (IRC).

2.6 Ethical Clearance

Ethical considerations were adhered to, with formal approval from the Institutional Review Committee (MMIH-IRC 593) and Siddhi Memorial Hospital Board, informed consent from participants, and confidentiality maintained throughout the research process.

3. Results

3.1 Socio-demographic characteristics

Table 1 shows that of the 207 respondents, near about two third (64.25%) were between the age of 28 and 38 years. About 90 percent of the respondents were from the hilly region, with the rest from the Terai region. Most of the respondents were married, with one person being divorced. More than two third (68.12%) were Dalit/Janajati. Three quarter of respondents (75.37%) belonged to a combined family. In terms of occupation, more than a half (59.42%) of respondents worked in an informal occupation (housewife) and 50.58% worked in a formal occupation. Most respondents (61.83%) had completed secondary school. 12.6% were below the poverty line and the rest were above the poverty line. The respondents were predominantly in the third trimester (53.14%), followed by the second trimester (28.99%) and the first trimester (17.90%).

Table 1: Socio-demographic characteristics of the respondents (n=207)

Characteristics	Number (n)	Percentage (%)
Age		
18 -27	74	35.75
28-38	133	64.25
Respondent Region		
Terai Region	19	9.20
Hill Region	188	90.80
Marital Status		
Married	206	99.41

Characteristics	Number (n)	Percentage (%)
Divorce	1	0.50
Ethnicity		
Brahmin/Chhetri	58	28.02
Dalit/Janajati	141	68.12
Others	8	3.86
Types of Family		
Nuclear	51	24.63
Joint	150	75.37
Occupation		
Informal	123	59.42
Formal	84	50.58
Education		
School Level Education	128	61.83
Higher Education	79	38.17
Socio-economic status		
Above Poverty Line (>1USD/day)	181	87.44
Below Poverty Line (<1USD/day)	26	12.56
Month of Pregnancy		
1st trimester	37	17.90
2nd trimester	60	28.99
3rd trimester	110	53.14

3.2 Knowledge regarding thyroid disorder among pregnant women

Table 2 shows that thyroid disorder was heard by 86 percent of the 207 respondents. Half (50.56%) of the respondents did not know the meaning of thyroid disorder. More than one-third of respondents (38.76%) indicated presence of goiter as the meaning of thyroid illness, followed by disease caused by inadequate thyroid hormone (18.54%) and disease caused by excess thyroid hormone (12.92%). More than two third of the respondents (68.54%) were unaware of the many types of thyroid diseases. Weight gain and goiter were mentioned as hypothyroidism symptoms by 71.42% of the 56 people polled. Similarly, 41.07%

indicated tiredness and sleepiness, 23.21% said menstrual disorder, and 39.28% said other symptoms.

Regarding hyperthyroidism, out of 56 respondents 80.35% said weight loss as a symptom followed by sore throat/joint pain (44.64%) and increased appetite (17.85%). About two third (62.92%) of the respondents knew about the thyroid test. Out of which 89.29% respondents knew about blood test followed by Thyroid-Stimulating Hormone (TSH) test (13.39%). 22.47% of the respondents knew the side effect of thyroid disorder at the time of pregnancy while rest of the respondent (77.53%) were unaware. Among 40 respondents, most of the respondents (87.50%) said miscarriage and

22.50% said preterm delivery as the effect of thyroid disorder. Among the respondents who had given correct response about thyroid disorder, the source of information was social media/internet 15.17%, book/newspaper 16.29%, Family/Friends 43.82% and from health professional was 40.44%.

81.16% did not know the preventive measures. Among 39 respondents who knew, more than third quarter (76.92%) said avoiding processed food, 46.15% said routine

checkup, 30.77% said avoiding smoking and alcohol and 30.77% said balanced diet as the preventive measures of thyroid disorders. 26.10 % of the respondents were aware about the role of iodine and 71.5% pregnant women have access to the thyroid test service.

Overall, out of 178 respondents, 65.20% had inadequate knowledge on thyroid disorder, while 34.80% had adequate knowledge on thyroid disorder.

Table 2: Knowledge of thyroid disorder, side effects and preventive practices (n=207)

Characteristics	Number (n)	Percentage (%)
Heard about Thyroid disorder(n=207)		
Yes	178	86.00
No	29	14.00
Meaning of Thyroid Disorder(n=178) **		
Disease caused due to less thyroid hormone	33	18.54
Disease caused due to excess thyroid hormone	23	12.92
Presence of goiter	69	38.76
Don't Know	90	50.56
Types of thyroid disorder		
Yes	56	31.46
No	122	68.54
Symptoms		
Hypothyroidism**		
Weight gain	40	71.42
Menstrual Disorder	13	23.21
Tiredness sleepiness	23	41.07
Goiter	40	71.42
Others	22	39.28
Hyperthyroidism**		
Weight Loss	45	80.35
Increased appetite	10	17.85
sore throat/Joint pain	25	44.64
Know about thyroid test (n=178)		
Yes	112	62.92
No	66	37.08
Types of thyroid test**		
Blood Test	100	89.29
TSH	15	13.39
Both	3	2.68
Know about possible side effect of thyroid disorder at the time of pregnancy		
Yes	40	22.47
No	138	77.53

Characteristics	Number (n)	Percentage (%)
Side effect of thyroid disorder at the time of pregnancy **		
Miscarriage	35	87.50
Preterm Delivery	9	22.50
Pre-eclampsia	3	7.50
Postpartum thyroiditis	2	5.00
Source of Information **		
Social media/internet	27	15.17
Book/Newspaper	29	16.29
Family/Friends	78	43.82
Health Professional	72	40.44
Known about thyroid problem prevention tips		
Yes	39	18.84
No	168	81.16
Prevention practices (n=39) **		
Avoid processed food	30	76.92
Routinely checkup	18	46.15
Stop smoking and alcohol	12	30.77
Balanced diet/Ionized salt	12	30.77
Role of Iodine		
Yes	54	26.10
No	153	73.90
Availability of service		
Yes	148	71.50
No	38	18.36
Don't know	21	10.14
Overall Knowledge		
Inadequate Knowledge (<6 mean score)	116	65.20
Adequate Knowledge (≥6 mean score)	62	34.80
Mean (SD)	6.40 (5.43)	

**** Multiple choice questions**

3.3 Health Risk activities and Preventive Practices

Table 3 shows the health risk activities and preventive practices of the respondents. Among 207 respondents, 2.9% of respondents consumed alcohol during the pregnancy period. 63.30% of respondents'

intake one teaspoon salt, whereas 26.60% of respondents' intake two teaspoons salt followed by more than two teaspoons (10.10%). Regarding the preventive practices, 68.66% have bad practices whereas about one fourth of respondents have good practices regarding thyroid disorder.

Table 3: Health risk activities and preventive practices (n=207)

Characteristics	Frequency (n)	Percentage (%)
Past activity of using alcohol/Tobacco		
Yes	67	32.4
No	140	67.6
Present Activity of using alcohol		
Yes	6	2.9
No	201	97.1
Present Activity of using Tobacco		
Yes	2	1

Characteristics	Frequency (n)	Percentage (%)
No	205	99
Salt intake per day		
one teaspoon	131	63.3
Two teaspoons	55	26.6
More than two	21	10.1
Preventive practices		
Bad Practices (<5 mean score)	46	68.66
Good Practices (≥5 mean score)	21	31.34
Mean (SD)	5 (1.78)	

3.4 Association of demographic variables with knowledge on Thyroid Disorder

Table 4 shows the association between knowledge level of thyroid disorder and demographic variables like respondent region, ethnicity, occupation, and education

level. The above-mentioned variables determine or contribute to knowledge on thyroid disorder among pregnant women. These variables were statistically significant ($p < 0.05$) at 95% level of confidence interval.

Table 4: Association of demographic variables with knowledge on Thyroid disorder

Characteristics	Adequate knowledge (%)	Inadequate knowledge (%)	χ^2	P-value
Ethnicity			6.63	0.023
Brahmin/Chhetri	6 (66.68%)	3 (33.32%)		
Dalit/Janajati	2 (14.29%)	12 (85.71%)		
Occupation			7.46	0.042
Informal	0 (0.00%)	8 (100.0%)		
Formal	6 (50.0%)	6 (50.0%)		
Education level			4.33	0.037
School level education	0 (0.00%)	6 (100.0%)		
Higher education	8 (47.13%)	9 (52.87%)		

3.5 Association of knowledge of thyroid disorder with its preventive practice

Table 5 shows that there was no association between knowledge of thyroid disorder and preventive practices. It showed that pregnant women with low level of knowledge on

thyroid disorder did not mean to have poor thyroid preventive practices. Also, women with high knowledge on thyroid disorder did not mean to have high knowledge on preventive practices of thyroid disorder.

Table 5: Association of knowledge of thyroid disorder with its preventive practice

Characteristics	Practice level		χ^2	P-value
	Poor Practice	Good Practice		
Knowledge level			3.41	0.06
Inadequate knowledge	5 (21.74%)	10 (43.48%)		
Adequate knowledge	0 (0.00%)	8 (34.78%)		

4. Discussion

Knowledge of thyroid disorder and its preventive practice among pregnant women attending selected maternal and child health clinic of Bhaktapur, Nepal was assessed in this study. In our study, 86% of respondents reported being aware of thyroid disorders. A comparison with a study by Rai et al. in Madhya Pradesh, India, where 70.8% of females had heard about thyroid disorders, reveals variations in awareness levels [8]. These disparities may be attributed to differences in regional healthcare education efforts, accessibility of healthcare information, demographic characteristics, cultural attitudes, and healthcare infrastructure. While our findings suggested relatively high awareness in the Bhaktapur region being near the capital city of Nepal, it's important to acknowledge that awareness levels can fluctuate due to diverse factors. One of the plausible reasons is that most of the respondents of our study were in the third trimester of pregnancy and they had already performed thyroid test as part of routine checkup. Also, most of the respondents have completed school level education, leading to more awareness about health issues. Regional, cultural, and socioeconomic distinctions, as well as variances in

healthcare systems, collectively contribute to the varying levels of knowledge about thyroid disorders among different populations.

In our study, we explored the sources of information about thyroid disorders among pregnant women attending maternal and child health clinics in Bhaktapur, Nepal. Our findings indicated that the primary sources of information were family and friends (43.82%), followed closely by health professionals (40.44%). Moreover, social media and the internet (15.17%) and books/newspapers (16.29%) also contributed to participants' knowledge about thyroid disorders. These findings align with a study conducted by Ghimire et al. in Nepal, which identified television (57%), friends (56%), and health professionals (34%) as major sources of information about thyroid disorders [9]. Additionally, a study by Prasad et al. reported that friends (56%) and healthcare professionals (36%) were significant sources of health-related information [10]. The concordance between our study and these prior investigations highlights the consistent influence of interpersonal sources, such as family, friends, and healthcare professionals, in disseminating information about thyroid

disorders. This underscores the importance of leveraging these trusted sources for health education initiatives. Furthermore, the increasing role of social media and the internet as information sources underscores the need for accurate and reliable online health resources and campaigns to ensure that individuals receive accurate information about thyroid disorders and other health topics.

The present study found that 65.2% of the participants exhibited inadequate knowledge about thyroid disorders, while 34.8% displayed adequate knowledge on the subject. These results resonate with a study conducted by Thapa SG et al. in Nepal, which reported that 53% of respondents had inadequate awareness of thyroid disorders, while 47% had adequate awareness[9]. Moreover, our findings align with studies carried out by Rai and Prasad et al. in India, where approximately half of the study participants demonstrated a poor level of knowledge on thyroid disorders[8, 10]. This consistency in findings across different studies shows the persistent challenge of insufficient awareness and knowledge regarding thyroid disorders among diverse populations, both in Nepal and in neighbouring India. It highlights the need for

targeted educational interventions and awareness campaigns to improve understanding and promote thyroid health in these regions.

In our study, an intriguing observation emerged regarding participants' understanding of thyroid disorders. A substantial proportion of respondents (50.56%) were associated thyroid disorders primarily with the presence of goitre, while an additional segment (38.76%) expressed no clear understanding of the term "thyroid disorder." This outcome is consistent with a study conducted in Central India, which assessed knowledge and awareness of thyroid disorders among women. In that study, nearly half (49.2%) of the participants provided a correct response regarding the meaning of thyroid disorder, with 18.8% offering incorrect responses and 26.4% admitting to having no knowledge of the term's meaning[8]. Furthermore, a similar study among patients with thyroid swelling in India reported that only 50% of respondents correctly understood the meaning of hyper or hypothyroidism[11]. The prevailing lack of clarity among our study participants regarding thyroid disorders' meanings and types suggests an underlying knowledge gap. This may be due to inadequate health

education and awareness campaigns targeting thyroid health in the study region. Additionally, the complexity of medical terminology and the nuanced nature of thyroid disorders may contribute to the observed confusion. To address this issue, concerted efforts are needed to enhance health literacy through comprehensive health education initiatives. The findings underscore the importance of tailoring educational interventions to specific populations to bridge the knowledge gap and promote better thyroid health awareness.

In our study, it was evident that individuals residing in the Hilly region exhibited lower knowledge levels regarding thyroid disorders. This phenomenon could be attributed to factors such as lower literacy rates, increased poverty rates, and limited access to health education and information in these remote areas of Nepal. These findings align with similar studies conducted in Nepal and India, which also identified challenges in raising awareness about thyroid disorders, particularly in geographically disadvantaged regions[10, 12]. Addressing these disparities necessitates region-specific health education initiatives and efforts to improve access to healthcare information, aiming to bridge the knowledge gap and promote better thyroid

health outcomes in hilly and underserved areas.

Our study revealed a notable disparity in knowledge levels regarding thyroid disorders, with Dalit/Janajati ethnicity exhibiting lower awareness. This finding is consistent with research conducted by Protheroe J et al., which suggests a positive association between lower health literacy and disadvantaged ethnic groups[13]. Moreover, previous studies within Nepal, conducted by Shrestha B and Afferaya M et al., have also highlighted a significant link between disadvantaged ethnicities, such as Janajati, and limited health knowledge regarding thyroid disorders and their implications during pregnancy [14, 15]. This disparity in knowledge could be attributed to several factors, including lower socioeconomic status, limited access to healthcare and education, and reduced exposure to health information resources.

Moreover, we observed a significant correlation ($P= 0.037$) between higher education levels among respondents and adequate awareness of thyroid disorders, with those holding graduate/postgraduate degrees demonstrating higher knowledge levels. This finding is consistent with a study

conducted by Prasad et al. in 2015, focusing on health information seeking behaviour among hypothyroid patients in Chennai, India. Prasad et al. also reported that participants with graduate/ postgraduate qualifications exhibited greater knowledge compared to those with lower or no formal education, with statistical significance ($P > 0.013$) [10]. This alignment in findings emphasizes the pivotal role of education in shaping awareness and knowledge levels regarding thyroid disorders.

The strengths of this study include its focus on a vulnerable population and its use of a structured questionnaire, providing quantitative data for analysis. However, its limitations, including the convenience sampling method and the exclusion of other MCH clinics, must be considered when interpreting the results.

5. Conclusion

The results of this study revealed a concerning gap in knowledge and awareness among the surveyed pregnant women. Despite the importance of thyroid health during pregnancy, a significant proportion (65.80%) of respondents were unaware of various thyroid disorders and their preventive practices. Only a minority (35.80%) of

respondents, demonstrated an acceptable level of knowledge. These findings underscore the urgent need for comprehensive health education initiatives targeting pregnant women in the study region. Such programs should aim to increase awareness about thyroid disorders, their consequences during pregnancy, and the importance of preventive measures.

To address the identified knowledge gap, it is recommended that healthcare providers in MCH clinics prioritize thyroid health education for pregnant women. This can be achieved through informational sessions, pamphlets, and counselling services. Additionally, further studies with more diverse and representative samples across different regions of Nepal is needed to obtain a more comprehensive understanding of thyroid disorder awareness among pregnant women in the country.

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