Awareness of Thyroid Disorders among Nepalese Women: A Cross-Sectional Study

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ABSTRACT

Background

Thyroid disorders are emerging public health issues. Clients' awareness is crucial for prevention, early diagnosis, and treatment of the thyroid disorders. Studies, assessing knowledge on thyroid disorders among Nepalese population, is lacking.

Objective

To assess the awareness of thyroid disorders among women, a susceptible subgroup, and find the correlates of poor knowledge.

Method

A cross-sectional study was conducted among 423 women at the gynecological outpatient department of Tribhuvan University Teaching Hospital. Eighteen-item scale, with a Cronbach's Alpha of 0.913, was developed to assess participant's knowledge on various constructs of thyroid disorder. A linear regression model with Bootstrap approach was used to identify the predictors of the total knowledge score.

Result

The mean (±SD) age of the participant was 29.2 ± 7.0 years. About 49% of the women had inadequate knowledge, defined at or below the mean cumulative knowledge score. In linear regression, the total knowledge score was significantly lower among participants who were Janajati (β=-2.87, BCa 95%CI=-4.61, -1.11), illiterate (β=-6.37, BCa 95%CI =-9.14, -3.21), and low income (β=-3.76, BCa 95%CI=-5.68, -1.83). Likewise, a university education (β=5.94, BCa 95%CI=3.50, 8.26), working status (β=4.04, BCa 95%CI=2.19, 5.81), urban residence (β=2.06, BCa 95%CI=0.02, 3.96) and family history (β=2.20, BCa 95%CI=0.71, 3.63) of thyroid disorder predicted higher knowledge score.

Conclusion

This study identified a poor level of knowledge on thyroid disorders among Nepali women and thus proposes them to be an important subgroup for an intervention or policy aimed at promoting awarenessof thyroid disorders. The findings also warrant increased awareness among these population through hospital and community-based behavior change communication campaigns.

KEY WORDS

Awareness, Thyroid disorders, Women

INTRODUCTION

Thyroid disorders are emerging public health issues, with changing trends in the etiopathogenesis.[1] Hypothyroidism, hyperthyroidism, goiter, iodine deficiency disorders, Hashimoto's thyroiditis, and thyroid cancer are common types of thyroid disorders; of this hypothyroidism and hyperthyroidism are most prevalent globally.[2] It is believed that most cases of thyroid dysfunction are undiagnosed and thus underreported.[3] Consequently, the prevalence of thyroid disorders varies with geographical area and population's iodine intake.

A hospital-based study from eastern Nepal estimated a prevalence of 13.68% and 17.19% for hyperthyroidism and hypothyroidism respectively.[4] Similarly, the prevalence of thyroid disorders was observed higher among females above 30 years compared to males in a study conducted at Kathmandu University Hospital and the tertiary care hospitals in central Nepal.[5,6] Early identification is crucial for prevention and efficient management of thyroid disorders.[7] Patient awareness is essential for prevention, early diagnosis, and treatment of the disorder. Paradoxically, over half of the clients with thyroid disorder are unaware of their condition.[8] Due to the lack of knowledge about thyroid disorders among patients, many cases go undiagnosed and/or suffer from complications.[9] The American Thyroid Association strongly recommends screening for thyroid dysfunction at age 35 years and every five years after that.[10] Nepal Government does not have similar kind of screening programs, policy, strategy or public awareness initiatives related to a thyroid disorder. Therefore, it becomes indispensable that Nepalese population needs to be self-aware of the condition and take necessary measure to prevent the disease. Previous studies have estimated the prevalence of the thyroid disorder in context to Nepal, and there is a dearth of scientific evidence on knowledge of the disorder among Nepalese population.[4,11,12]

Thyroid disorders are more prevalent among females compared to males.[2] The risk being five to eight times higher among females.[2,13] Among women, thyroid abnormalities are more common during pregnancy and after delivery of a child.[14] Considering Nepalese women's experience of inequality in different socio-cultural aspects, and their increased susceptibility towards thyroid disorder it would be important to study the level of knowledge among Nepalese women on thyroid disorder for understanding the current situation, designing the awareness and prevention activities. Therefore, we aim to assess the awareness of thyroid disorders among female clients in a tertiary care hospital in Kathmandu, Nepal and find the correlates of the knowledge.

METHODS

We followed the Strengthening the Reporting of Observational Studies in Epidemiology, STROBE, guidelines for reporting this study.[15] A cross-sectional study was conducted at the gynecological outpatient department (OPD) of Tribhuvan University Teaching Hospital (TUTH). The sample size of 423 was calculated in Decision Analyst STATS™ 2.0 based on the 49.2% prevalence, at 95% confidence interval, 5% the margin of error and 10% non-response rate.[16] Consecutive sampling method was used to recruit participants. Women visiting gynecological OPD of TUTH were approached for eligibility and consent. The eligibility criteria for this study were: female clients, age 18 years and above attending the gynecological OPD of TUTH during the study period. All eligible and consenting participants were included in this study until the final sample size was reached.

Data were collected from 22nd September 2016 to 5th January 2017. An individual face-to-face interview, at clients waiting time, was conducted. Semi-structured questionnaires were used to gather the study information. The study tool, initially developed in English, was translated into the Nepali language. The Nepali version of the tool was pretested among 10% of the sample size and necessary corrections were made on the tools.

This study was approved by Institution Review Committee (IRC) of Manmohan Memorial Institute of Health Sciences, Tribhuvan University. A detailed explanation of the purpose of the study was provided to each participant, prior to the interview, and subsequently, verbal consent was taken from each participant who participated voluntarily. The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki.[17] The identity of respondents was kept confidential.

Eighteen items scale was developed to assess participant's knowledge on various constructs of thyroid disorders such as knowledge of thyroid disorders, its types, risk factors, symptoms, treatment, preventive measures, possible complications, role of iodine in Thyroid Disorders (TD) and sources of iodine. The different items of knowledge scale are listed in Table 2. Of the 18 items, ten items (i.e., item 1-3,5, 9, 11, 13, 15-17) were assessed as yes/no, and a score of one was given for each "yes" response. Remaining eight items (i.e., item 4, 6-8,10, 12, 14, 18) were assessed by multiple choice response. In multiple response items, participants scored one for identifying one correct response, two for identifying two correct response, three for identifying three or more correct response and zero if they could not identify any correct response. The Cronbach's Alpha, which measures the scale reliability, was 0.913 of our 18-item knowledge scale. The cumulative total of 18 item indicated total knowledge score of the participants. Therefore, the total knowledge score could range from 0-34. Higher total scores indicate higher levels of knowledge on TD. A participant scoring at or below the mean cumulative knowledge score was considered to have inadequate knowledge; else they were considered to have adequate knowledge.

Socio-demographic variables included: age, ethnicity, religion, marital status, age at marriage, educational status, participant's occupation, family's primary economic activity and monthly income, family structure, residence type, family history of thyroid disorder, and ever tested for thyroid function, collected by self-report. For ethnicity, the Nepal Health Management Information System's classification was used and similar categories were combined to obtain three ethnic groups: Upper Caste, Janajatis, and Dalits and Minorities.[18] Upper caste included Hill Brahman, Hill Chhetri, Terai Brahman/Chhetri; Janajati included Hill Janajati and Terai Janajati; and Dalits and Minorities included Hill Dalits, Terai Dalits and Minorities.[18] Religion was recorded as Hindu and others religion as non-Hindu. Educational status was categorized into illiterate, formal schooling (any level of formal schooling), high school (completed grade 12), and university education (education beyond grade 12). The response on marital status (married vs. never married), family structure (joint vs. nuclear), and residence (rural vs. urban) were dichotomized. Monthly income of family was collected in Nepali rupees (NRs) but was converted into US dollar (1$=100 NRs). Participants' occupation was collected as homemaker/housewife, student, and paid jobs. Likewise, the primary economic activity of family was categorized as agriculture, business, employer-paid jobs, and others.

The collected data were managed in Epi-data 3.1, and statistical analyses were performed in IBM SPSS 22. (Statistical Package for Social Sciences) for Windows (SPSS Inc. Chicago IL, USA). Numerical variables were expressed in mean and standard deviation and categorical in frequency and percentage. The mean difference between the groups was compared by t-test and frequencies were compared by Pearson's chi-square (χ^2) test, or Fisher Exact test, as applicable. Linear regression was used to identify the predictors of the total knowledge score. We used Bootstrap models with 5000 replications to calculate stable estimates. An estimate is significant if the bias accelerated and corrected (BCa) confidence intervals do not include a zero.

RESULTS

Detailed demographic characteristics of the respondents are provided in Table 1. The study included 423 female clients attending the gynecological OPD of TUTH. The mean age (±SD) of the participant was 29.2 ± 7.0 years and ranged from 20-60 years; only two participants were elderly (age ≥ 60 years). Majority of the participants were from upper caste (50.4%), followed Hindu religion (83.0%), married (84.6%), and had completed high school (41.4%). Although the more than half of the participants were homemakers (57.2%), their family's main economic activity was employer paid job (37.1%) and a monthly family income ranging from $200 - $300 USD. More than half of the participants lived

Table 1. Socio-demographic characteristics of respondents (n=423)

Socio-demographic characteristic	n (%)
Age, mean ± SD	29.2 ± 7.0
Age category	
Below 30 years	276 (65.2)
30 years and above	147 (34.8)
Ethnicity	
Upper caste	213 (50.4)
Janajati	157 (37.1)
Dalits and Minorities	53 (12.5)
Religion	
Hindu	351 (83.0)
Non-Hindu	72 (17.0)
Marital Status	
Married	358 (84.6)
Never Married	65 (15.4)
Age at marriage (n=358), mean ± SD	18.9 ±3.3
Educational status	
High school	175 (41.4)
Illiterate	20 (4.7)
Formal schooling	152 (35.9)
University education	76 (18.0)
Occupation	
Homemaker	242 (57.2)
Student	64 (15.1)
Paid jobs	117 (27.7)
Economic activity of family	
Agriculture	111 (26.2)
Business	133 (31.4)
Jobs	157 (37.1)
Others	22 (5.2)
Family income per month	
Less than $200	89 (21.0)
$200-$300	138 (32.6)
$301-$400	142 (33.6)
Above $400	54 (12.8)
Family structure	
Joint	244 (57.7)
Nuclear	179 (42.3)
Residence	
Rural	304 (71.9)
Urban	119 (28.1)
Family history of thyroid disorder	
Yes	108 (25.5)
No	315 (74.5)
Participant ever test their thyroid function	
Yes	147 (34.7)
No	276 (65.3)

in a joint family (57.7%) and rural areas (71.9%). A quarter of the participants had a family history of thyroid disorder, and 34.7% of the participant was ever tested for their thyroid function.

Participants' response on different items of knowledge scale is listed in Table 2. About 41% of the participants had not heard about TD. A high proportion of the respondents did not explain correctly about TD (64.5%), types (83.9%), risk factors (63.6%), symptoms (40.9%), treatment (56.7%), preventive measure (53.2%), and possible complications (83.0%) of thyroid disorders. Only 29.3% of the participants had the knowledge on the role of iodine in relation tothyroid, and 46.8% identified that inadequacy of iodine might cause TD. About 41.4% of the participants could not identify any source of iodine (Table 2).

Table 3 presents the bivariate and linear regression analysis on participant's level of knowledge on thyroid disorders with socio-demographic variables. The mean total knowledge score was 12 and ranged from 2-32. In linear regression, compared to Upper caste, the total knowledge score was significantly lower among Janajati (β=-2.87, BCa 95% CI= -4.61, -1.11). Non-Hindu participants had lower knowledge score compared to Hindu participants (β=-3.88, BCa 95% CI=-5.99, -1.70). Compared to those with formal schooling, knowledge was significantly lower among illiterate participants (β= -6.37, BCa 95%CI= -9.14, -3.21) and higher among participants with university education (β=5.94, BCa 95% CI=3.50, 8.26). Compared to homemakers, knowledge was higher among those who were involved in paid jobs (β=4.04, BCa 95% CI=2.19, 5.81). Also, knowledge level was higher among women from a household whose main economy was based on employer-paid jobs (β=3.91, BCa 95% CI=2.11, 5.69). Family's income was a significant predictor of knowledge score. Compared to the family with a monthly income of $200-$300USD, women from families with higher income ($301-$400) had higher knowledge (β=1.96, BCa 95% CI=0.02, 3.95) and lower income (Less than $200) had lower knowledge score (β=-3.76, BCa 95% CI=-5.68, -1.83). Residing in an urban area (β=2.06, BCa 95% CI=0.02, 3.96) and family history (β=2.20, BCa 95% CI=0.71, 3.63) of thyroid predicted higher knowledge score, compared to those residing in the rural area and with no family history of TD respectively.

DISCUSSION

In this study, we assessed the awareness of thyroid disorder among Nepalese women in the gynecological OPD of TUTH. Overall, a high proportion of participants lacked information on various aspects of thyroid disorder including definition, types, risk factors, symptoms, treatment, and preventive measures. Many sociodemographic characteristics were associated with participants knowledge. Similar studies from India, conducted in similar setting also reported poor level of knowledge among half of the study

Table 2. Participant's knowledge on different aspects of thyroid disorder

18 items on knowledge of thyroid disorder (TD) score	n (%)
1. Heard about TD	
Yes	251 (59.3)
No	172 (40.7)
2. Explain correctly about TD	
Yes	150 (35.5)
No	273 (64.5)
3. Heard about different types of TD	
Yes	68 (16.1)
No	355 (83.9)
4. Of types of TD identified correctly	
None	357 (84.4)
One	25 (5.9)
Two	41 (9.7)
5. Knowledge on risk factors of TD	
Yes	154 (36.4)
No	269 (63.6)
6. Of risk factor of TD identified correctly	
None	175 (41.4)
One	107 (25.3)
Two	43 (10.2)
Three or more	98 (23.2)
7. Of symptoms of hyperthyroidism identified correctly	
None	173 (40.9)
One	1 (0.2)
Two	39 (9.2)
Three or more	210 (49.6)
8. Of symptoms of hypothyroidism identified correctly	
None	199 (47)
One	94 (22.2)
Two	53 (12.5)
Three or more	77 (18.2)
9. Knowledge on treatment of TD	
Yes	240 (56.7)
No	183 (43.3)
10. Of treatment options of TD identified correctly	
None	188 (44.4)
One	183 (43.3)
Two	40 (9.5)
Three or more	12 (2.8)
11. Knowledge on whether TD is preventable	
Yes	198 (46.8)
No	225 (53.2)
12. Of preventive measure of TD identified correctly	
None	225 (53.2)
One	9 (2.1)
Two	31 (7.3)

Three or more	158 (37.4)

13. Knowledge on possible complications of TD

Yes	72 (17)
No	351 (83)

14. Of possible complications of TD identified correctly

None	354 (83.7)
One	33 (7.8)
Two	28 (6.6)
Three or more	8 (1.9)

15. Identified correctly the importance of continuing medication even after a normal thyroid level

Yes	83 (19.6)
No	340 (80.4)

16. Knowledge on role of iodine

Yes	124 (29.3)
No	299 (70.7)

17. Knowledge on role of inadequacy of iodine in causing TD

Yes	198 (46.8)
No	225 (53.2)

18. Of sources of iodine identified correctly

None	175 (41.4)
One	103 (24.3)
Two	71 (16.8)
Three or more	74 (17.5)

Table 3. Factors associated with participant's knowledge

	Adequate Knowledge, n(%)	Inadequate Knowledge n (%)	p-value	β	BCa 95%CI
Total knowledge score, mean ± SD	20.1±4.3	3.4 ± 3.2	<0.001[a]		
Overall frequency	216 (51.1)	207 (48.9)			
Age, mean ± SD	28.2 ± 6.5	29.3 ± 8.4	0.12[a]	-0.09	-0.20, 0.03
Age category			**0.040**		
Below 30	151 (54.7)	125 (45.3)	Reference		
30 and above	65 (44.2)	82 (55.8)		-1.74	-3.56, 0.09
Ethnicity			**0.011**		
Upper caste	124 (58.2)	89 (41.8)	Reference		
Janajati	67 (42.7)	90 (57.3)		**-2.87**	**-4.61, -1.11**
Dalits and Minorities	25 (47.2)	28 (52.8)		-0.87	-3.39, 1.63
Religion			**0.005**		
Hindu	190 (54.1)	161 (45.9)	Reference		
Non-Hindu	26 (36.1)	46 (63.9)		**-3.88**	**-5.99, -1.70**
Marital Status			0.554		
Married	185 (51.7)	173 (48.3)	Reference		
Never Married	31 (47.7)	34 (52.3)		0.43	-2.20, 3.17
Age at marriage (n=358), mean ± SD	18.9 ± 3.2	18.8 ± 3.4	0.730[a]	0.01	-0.30, 0.31
Educational status			**<0.001**		
High School	101 (57.7)	74 (42.3)		1.42	-0.32, 3.13
Illiterate	4 (20.0)	16 (80.0)		**-6.37**	**-9.14, -3.21**
Formal Schooling	58 (38.2)	94 (61.8)	Reference		
University Education	53 (69.7)	23 (30.3)		**5.94**	**3.50, 8.26**
Occupation			**<0.001**		
Homemaker	104 (43.0)	138 (57.0)	Reference		
Student	36 (56.3)	28 (43.8)		1.59	-1.07, 4.16
Paidjobs	76 (65.0)	41 (35.0)		**4.04**	**2.19, 5.81**
Family's Economic activity			**0.018**		
Agriculture	45 (40.5)	66 (59.5)	Reference		
Business	67 (50.4)	66 (49.6)		-0.47	-2.31, 1.42
Jobs	94 (59.9)	63 (40.1)		**3.91**	**2.11, 5.69**
Others	10 (45.5)	12 (54.5)		-0.73	-4.38, 3.08
Income			**0.029**		
Less than $200	33 (37.1)	56 (62.9)		**-3.76**	**-5.68, -1.83**
$200-$300	74 (53.6)	64 (46.4)	Reference		
$301-$400	78 (54.9)	64 (45.1)		**1.96**	**0.02, 3.95**
Above $400	31 (57.4)	23 (42.6)		1.71	-0.98, 4.5
Family structure			0.479		
Joint	121 (49.6)	123 (50.4)	Reference		
Nuclear	95 (53.1)	84 (46.9)		0.61	-1.19, 2.33
Residence			0.629		
Rural	153 (50.3)	151 (49.7)	Reference		
Urban	63 (52.9)	56 (47.1)		**2.06**	**0.02, 3.96**
Family history of thyroid disorder (n=251)			0.699		
Yes	56 (87.5)	8 (12.5)		**2.20**	**0.71, 3.63**
No	160 (85.6)	27 (14.4)	Reference		
Participant ever test thyroid function (n=251)			0.114		
Yes	79 (90.8)	8 (9.2)		-2.81	**-4.22, -1.42**
No	137 (83.5)	27 (16.5)	Reference		

[a]p-value from t-test; all others are from chi-square.
[β]Unstandardized coefficient; [BCa]Bias-corrected and accelerated.
Number of bootstrap samples for bias-corrected bootstrap confidence intervals: 5000
Statistically significant values are in bold.

participants.[16,19,20] Given that similar study in Nepal is lacking and since India closely resembles Nepalese society socio-culturally, it may be a valid comparison.[16]

This study showed lower knowledge of thyroid disorders among Janajati ethnicity which was not surprising findings in Nepalese context. Several studies provided the evidence that the lower health literacy was positively associated with disadvantage ethnic groups.[21,22] Previous studies from Nepal have shown a significant link between disadvantaged ethnicity (e.g., Janajati) and poor health knowledge on uterus prolapse and HIV/AIDS.[23,24] Compared to Upper caste, Janajati ethnic group have low socioeconomic status, limited access to health, and education which explains the poor knowledge observed in our study.[24] In the current study, knowledge was lower among illiterate participants and higher among those with university education. The scientific evidence on health disparities has widely confirmed the association between levels of education and health knowledge.[25,26]

Family's income was a significant predictor of knowledge score. Given that family's income is directly linked to education and access to health care, it may account for the observed association between knowledge and income in the current study.[27-29] Educated and employed women are more involved in the decision-making to utilize the health care services.[22] The association between health knowledge and income has been well documented in the literature.[30] Incurrent study, those residing in the rural area had the lower knowledge, which may be due to the low level of literacy, high rate of poverty and limited access to health education and information in rural parts of Nepal.[24] The urban-rural discrepancy in knowledge is also supported by a similar study in India where participants in urban setting had higher literacy and knowledge on thyroid disorder compared to their rural counterparts.[19] Consistent with previous study, family history of thyroid disorder predicted higher knowledge.[9] It is likely that having a family member with the given condition may expose an individual to different aspects of the disease and thus help to develop a better understanding of the problem.[31]

This study has few limitations. First, our study is subjected to selection bias. Secondly, it was conducted among participants attending an OPD of a hospital in the urban area. Thus, the participants are more likely to be representative of a population having access to health care. Health care is not easily accessible to nearly 79% of rural households and 16.4% of urban households of Nepal.[32] Participants who have access to health care have higher health information.[33,34] Thus the findings may be overestimated. Finally, the findings are limited to females of reproductive age group. Nevertheless, the study is one of its first kinds in assessing knowledge of an emerging public health issue among Nepalese population. Although we provide preliminary results, a more comprehensive study, including both gender and diverse geographical areas are necessary.

CONCLUSION

The epidemiology of thyroid disorder in the context of Nepal is still an iceberg phenomenon. Our study identified a poor level of knowledge on thyroid disorder among the clients. Clients' knowledge level is associated with their age, ethnicity, religion, education status and income status. Therefore, Nepalese women visiting gynecology OPD are proposed to be an important subgroup for an intervention or policy aimed at promoting knowledge of thyroid disorder. The findings also warrant increased awareness among these populations through hospital and community-based behavior change communication campaigns.

ACKNOWLEDGEMENTS

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