Factors influencing women's decision choosing a public or private health facility for tuberculosis (TB) services: An analysis of Nepal demographic and health survey data 2016

Tula Ram Sijali[1], Rija Manandhar[1], Hridaya Raj Devkota[1]

1 Institute for Social and Environmental Research-Nepal

Abstract

Background: Nepal is committed to providing reliable and free Tuberculosis (TB) services through public health facilities, but a considerable number of TB cases seek services from the private sector. There have been no previously published studies investigating factors that influence women's decision to choose a public or private health facility for TB services. Therefore, we aimed to examine how women's socio-demographic characteristics influence this decision.

Methods: We conducted an analysis using data from the Nepal Demographic and Health Survey (NDHS) 2016. The NDHS 2016 was a nationally representative cross-sectional study. A descriptive, bivariate and multivariate logistic regression method was used in the analysis.

Results: Overall, 88% of women chose a public health facility as their preferred place for the diagnosis and treatment of TB. Women having good TB knowledge (aOR: 1.90, 95% CI: 1.52-2.39), women aged 45-49 years (aOR: 3.98, CI: 2.68-5.91), and women living in the mountain region (aOR: 3.16, CI: 1.78-5.61) were more likely to prefer a public health facility. Women belonging to the richest category (aOR: 0.54, CI: 0.38-0.78), and being of Muslim (aOR: 0.42, CI: 0.28-0.64) were less likely to choose a public health facility for diagnosis and treatment of TB.

Conclusion: This study indicates a considerable number of women have an insufficient level of access to quality TB services from a public health facility in Nepal. Inadequate TB knowledge, younger age, unemployment, and social stigma were all associated with women not preferring the public health facilities for the diagnosis and treatment of TB. We believe the findings of the analysis will help policy makers and program managers to fine-tune an intervention plan focusing on these women who are less likely to prefer public health facilities for TB services.

Tula Ram Sijali[1], **Rija Manandhar**[1], **Hridaya Raj Devkota**[1,2,*]

[1] *Institute for Social and Environmental Research – Nepal*

[2] *School of Public Health, University of California, Berkeley, CA 94720, USA*

[*]Corresponding author:

Tula Ram Sijali, Institute for Social and Environmental Research – Nepal (ISER-N), Phulbari, Bharatpur – 19, Chitwan, Nepal

Email: sijali.tula@gmail.com

Tel: +977 9848050135

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Background

A sign of progress being made towards ending the global TB epidemic was that 22% of deaths from TB were prevented during the period of 2000 and 2016 worldwide [1]. However, TB is still a leading cause of infection and sickness in millions of people each year worldwide [2]. Globally, half of the total new cases occur in Asian countries[3]. TB is the sixth leading cause of death in Nepal. The National TB program (NTP) of Nepal reported that 31,764 new cases were registered in 2017, of which 77% were bacteriologically confirmed [4].

It is estimated that of the total annual expected new TB cases, more than 40% globally[3] and about 29% in Nepal are unidentified [4]. It is assumed that many of the undetected TB cases are treated by the private sector and unreported in national statistics [1]. Nepal's NTP provides TB services and management of multi drug-resistant (MDR) TB through the primary health care system in Nepal [4], although the NTP estimated that half of urban expected TB cases seek services from the private sector and that the quality of TB care in the private sector is mostly below the NTP standards [5]. Private practitioners diagnose TB with X-rays, treat with inappropriate regimens, do not trace defaulters, rarely follow NTP guidelines, and fail to notify cases in the NTP reporting system [6][7][8][9]. A study conducted in Nepal shows that out of the total identified TB cases, 61% were managed under the regular TB program and 39% were managed and referred by

private sector in Nepal [10]. A study conducted in Nepal showed that 77% of women with TB initially consulted at a public health facility for their treatment [11]. Given the concerns about treatment quality and effectiveness in the private sector, it becomes increasingly important to ensure that women are seeking treatment in public facilities. So, the critical question is: Why do all women fail to go to a public health facility for diagnosis and treatment of TB?

Evidence shows that social discrimination, cultural beliefs, inequality in education, poor access to resources, low health literacy, unemployment, social stigma, and distance to health facilities are barriers that reduce access to general health care services for Nepali women [12][13]. Those studies also suggest the factors that influence in health-seeking behavior and choosing a health facility are service quality, cost of services, drug availability, and opening hours of the health facility [14]. Moreover, socio-demographic characteristics, such as women's age, education, marital status, family wealth and economic status, caste/ethnicity, women's occupation, place of residence, and women's awareness level on health, access to resources and freedom to make decisions and seeking services play a critical role in health services utilization [15][16].

In Nepal, no study has been conducted with a large population sample assessing the factors influencing women's decisions to choose a health facility for a diagnosis and treatment of TB. This study aimed to identify the influencing factors in women's decision choosing public or private health facilities in Nepal.

Methodology

Setting

Nepal is a Himalayan country surrounded by China in the north and India to the east, south, and west. Administratively, it is divided into seven provinces with 77 districts, 293 metropolitan areas/municipalities, and 460 rural municipalities. Ecologically, the country is divided into three zones (Mountain, Hill, and Terai) with diverse topography and climate. According to the 2011 census, the total population of the country is 26.5 million and the female population is slightly more than male (ratio-100:94). More than half of the total population resides in the Terai (the plain southern belt). The population is diverse in terms of culture, religion, caste, ethnicity, and language. More than 81% of the population are Hindu. Women's literacy rate is low (57%) compared to men (75%) [17].

The basic health care services in Nepal are delivered through health posts and primary healthcare centers at the community level and secondary care services through district hospitals. In addition to the government health sector, there is a wide network of NGOs and private-sector hospitals, nursing homes, clinics, and pharmacies. However, the private sector services are primarily urban-based. The majority of the rural population receives services from government health facilities.

Sampling and sample size

The NDHS 2016 data was used in the analysis. The NDHS was a population-based cross-sectional and nationally

representative household survey. A total of 12,862 women aged 15-49 were interviewed among 13,089 women identified from 11,473 households selected using a multi-stage sampling method. For this analysis, only those women who reported a preference for TB services at either a public or a private facility were included: a total of 10,119. Excluded were 2,133 women who chose both public and private health facilities and 610 who chose neither public nor private health facilities.

Measurements

Women's preferred health facility for TB services was used as the dependent variable, and TB knowledge, media exposure, distance to the health facility, women's empowerment represented by availability of money, freedom to go health facility (getting permission), and ability to go alone, service provider's gender and socio-demographic characteristics were used as independent variables.

Dependent variable

A binary dependent variable "preferred place for TB care" was derived from questions which asked about the women's preferred place to seek TB services in the NDHS 2016. For this, any level of government health facilities, including the services of female community health volunteers, were considered a public health facility and coded "1"; any private health facility, including any private hospital, clinic, or nursing home, pharmacy, shop, or NGO were considered a private health facility and coded "0".

Independent variables

Women's age, caste/ethnicity, education, occupation, family size, wealth ranking, head of household, place of residence, ecological region, TB knowledge, media exposure, distance to health facility, freedom to seek services (getting permission) and ability to go the health facility alone, availability of money, and service provider's gender were used as independent variables in the analysis.

A variable, women's knowledge of TB, was developed combining the questions asked to women about TB symptoms, transmission, misconceptions, and attitude. A total of 19 questions were asked and if the question was correctly answered - it was coded 1, otherwise it was coded 0 and summed to obtain an overall composite score of knowledge. The scores ranged was seven to 19. Knowledge was classified as poor with a score of 7 –13, fair for 14 – 15, and good for 16 – 19.

Table 1. Key variables and their definitions

Variables	Definition
TB knowledge	TB knowledge was derived from the questions asked about the symptoms, mode of transmission, misconception, and attitude, categorized as: poor, fair, good
Media exposure	Use of newspaper, television, and radio at least once a week was defined as exposure to media
Age	Completed years of age of women at the time of the survey, categorized as: 15-24, 25-34, 35-44, 45-49
Caste/Ethnicity	The self-reported caste and ethnic group of women, categorized as: Brahmin/Chhetri, Jana Jaati, Dalit, Muslim, other/Terai caste
Education level	Number of years of formal education completed by women, categorized as: none, primary, secondary, higher
Occupation	Self-reported occupation of the women at the time of interview, categorized as: unemployed, self-employed, professional service, manual work
Family size	Family with four or fewer members was defined as a small/nuclear family; a family with five or more members was defined as a large/extended family.
Wealth ranking	Used the wealth ranking defined as wealth quintile in NDHS: poorest, poorer, middle, richer, richest
Gender of household head	Sex of self-reported head of house
Place of residence	Self-reported place of residence at the time of interview: Urban or rural
Ecological region	The ecological region was recorded that the women mentioned in the interview: Terai, Hill, or Mountain
Distance to health facility	The women's response was recorded of the distance to the health facility was a problem or not for seeking health services
Freedom to go out	Self-reported women's level (mobility) of freedom to make the decision to go to a health facility categorized as a problem and no big problem.
Ability to go health facility alone	Whether or not the women could go to the health facility alone and categorized as a problem and no big problem.
Availability of money	Whether or not money was a problem to seek intended health services.
Service provider's gender	Whether or not women felt uneasy to go the health facility due to the lack of female staff.

Data Analysis

Data were analyzed using Stata/IC 12.1 for Mac (StataCorp. 2011. Stata Statistical Software: Release 12. College Station, TX: StataCorp LP). Due to the NDHS sampling design, statistics were adjusted to account for population weights and the cluster design. Descriptive analysis was conducted to describe the frequencies for each variable value; while actual response counts are reported, relative percentages were calculated using the population weights. Bivariate analysis was used to measure associations between the independent variables and the outcome variable. Finally, a multivariate binary logistic regression method was used to assess the independent association of the independent variables with the outcome variable. The results were presented in terms of odds ratios, 95% confidence intervals, and p-values.

Results

Descriptive analysis

Table 2 shows the characteristics of all women included in this study. The mean age of the study population was 29 years, with SD ±9.8. One-third of the women reported having no formal education, and were unemployed. Less than one-third of women reported a female household head. Two-thirds of the women resided in urban areas while half of the interviewed

women were from the Terai. Slightly more than half of women reported living far from a health facility and lack of money as problems. Two-thirds of the women reported two issues as problems: facilities having no female service providers, and not being able to go to the health facility alone. On the other hand, less than a quarter of the women reported getting permission from the household head as a problem. While most (85%) women had some media exposure, over 40% had poor knowledge of TB.

Table 2. Distribution of survey participants by selected socio-demographic characteristics

Characteristics	Number (%*)
Health facility preference of survey participants	
Private	1164 (12)
Public	8955 (88)
Age	
15-24	3822 (37)
25-34	3071 (31)
35-44	2325 (23)
45-49	901 (9)
Caste/ethnicity	
Brahmin/Chhetri	3632 (32)
Jana Jaati	3261 (32)
Dalit	1335 (12)
Muslim	423 (5)
Other caste	1468 (19)
Education (School/Formal)	
None	3334 (32)
Primary	1621 (17)
Secondary	3713 (36)
Higher	1451 (15)
Occupation	
Unemployed	3169 (33)
Self employed	5027 (46)
Professional service	1337 (15)
Labor work	586 (6)
Family size	
Small/nuclear	4155 (42)
Large/extended	5964 (58)
Wealth ranking	
Poorest	2100 (17)
Poorer	2149 (20)

Middle	2012 (20)
Richer	2022 (21)
Richest	1836 (22)
Gender of household head	
Male	6879 (69)
Female	3240 (31)
Place of residence	
Urban	6598 (64)
Rural	3521 (36)
Ecological zone	
Terai	4790 (50)
Hill	4551 (44)
Mountain	778 (6)
Knowledge of TB	
Poor	4164 (41)
Fair	4061 (40)
Good	1864 (19)
Media exposure	
No	1468 (15)
Yes	8651 (85)
Distance to health facility	
A big problem	5457 (52)
No big problem	4662 (48)
Freedom to go health facility	
A big problem	2354 (22)
No big problem	7765 (78)
Ability to go health facility alone	
A big problem	6875 (67)
No big problem	3244 (33)
Availability of money	
A big problem	5465 (53)
No big problem	4654 (47)
Service provider's gender	
A big problem	6702 (66)
No big problem	3417 (34)

*Percentages adjusted based on survey population weights

Bivariate analysis

Table 3 illustrates the results of the bivariate analysis. The results show evidence of associations of TB knowledge,

distance to the health facility, availability of money, ability to go to the health facility alone, service provider's gender, age, caste/ethnicity, education, occupation, family size, wealth ranking, head of household and ecological region with women's decision choosing a preferred health facility for diagnosis and treatment of TB.

Women having good TB knowledge were twice as likely to prefer a public health facility as women having poor TB knowledge, but general media exposure had no significant effect. There was a strong dose-response relationship between age and choice of facility: the older the woman, the more likely she was to select a public facility, with the oldest women group (45-49) over five times as likely and women age group 25-34 twice as likely to select a public facility compared to the women in the 15-24 age group. Muslim women were only a third as likely to select a public facility as Brahmin/Chhetri women. The level of education was associated with the choice of the facility, but negatively: women with any education were a third to half as likely to choose a public facility as those with no education. Wealth was also negatively associated with choosing public facilities for the diagnosis and treatment of TB, with a mild dose-response relationship: The wealthier the woman, the less likely she was to choose a public facility, with the women in the highest three quintiles less than half as likely as those in the poorest quintile. Employed women were twice likely to select a public facility compared to unemployed. Women able to go to the health facility alone were more likely to use the public health facility when compared to women unable to go alone. Finally, women living in the hilly and mountainous regions were more likely than women in the Terai to select a public facility, with mountain women nearly five times as likely.

Table 3. Results of the bivariate analysis of independent and dependent variables

Characteristics	Private health facility n (%)	Public health facility n (%)	OR (95% CI)	p-value
Knowledge of TB				
Poor	600 (14)	3564 (86)	1	
Fair	408 (10)	3653 (90)	1.57 (1.31-1.88)	0.000
Good	156 (8)	1738 (92)	1.97 (1.58-2.44)	0.000
Media exposure				
No	121 (8)	1384 (92)	1	
Yes	1043 (12)	7571 (88)	1.07 (0.83-1.37)	0.605
Distance to health facility				
A big problem	559 (10)	4898 (90)	1	
No big problem	605 (13)	4057 (87)	0.84 (0.72-0.99)	0.041
Freedom to go health facility				
A big problem	287 (12)	2067 (88)	1	
No big problem	877 (11)	6888 (89)	1.16 (0.95-1.42)	0.141
Ability to go health facility alone				
A big problem	823 (12)	6052 (88)	1	

No big problem	341 (11)	2903 (89)	1.34 (1.13-1.60)	0.001
Availability of money				
A big problem	565 (10)	4900 (90)	1	
No big problem	599 (13)	4055 (87)	0.83 (0.71-0.96)	0.014
Service provider's gender				
A big problem	820 (12)	5882 (88)	1	
No big problem	344 (10)	3073 (90)	1.34 (1.09-1.64)	0.006
Age				
15-24	688 (18)	3134 (82)	1	
25-34	276 (9)	2795 (91)	2.20 (1.85-2.62)	0.000
35-44	159 (7)	2166 (93)	3.14 (2.54-3.88)	0.000
45-49	41 (5)	860 (95)	5.02 (3.42-7.38)	0.000
Caste/ethnicity				
Brahmin/Chhetri	309 (9)	3323 (91)	1	
Jana Jaati	357 (11)	2904 (89)	0.86 (0.70-1.06)	0.166
Dalit	115 (9)	1220 (91)	0.88 (0.65-1.19)	0.400
Muslim	114 (27)	309 (73)	0.29 (0.20-0.43)	0.000
Other	269 (18)	1199 (82)	0.49 (0.38-0.63)	0.000
Education (School/Formal)				
None	252 (8)	3082 (92)	1	
Primary	188 (12)	1433 (88)	0.63 (0.49-0.81)	0.000
secondary	534 (14)	3179 (86)	0.52 (0.42-0.64)	0.000
Higher	190 (13)	1261 (87)	0.60 (0.44-0.82)	0.002
Occupation				
Unemployed	534 (17)	2635 (83)	1	
Self employed	429 (8)	4589 (92)	2.21 (1.84-2.64)	0.000
Professional service	125 (9)	1212 (91)	2.05 (1.57-2.69)	0.000
Labor work	76 (13)	510 (87)	1.46 (1.04-2.06)	0.029
Family size				
Small/nuclear	421 (10)	3734 (90)	1	
Large/extended	743 (12)	5221 (88)	0.74 (0.62-0.87)	0.000

			0.87)	
Wealth ranking				
Poorest	131 (6)	1969 (94)	1	
Poorer	185 (9)	1964 (91)	0.72 (0.53-0.97)	0.029
Middle	256 (13)	1756 (87)	0.46 (0.33-0.63)	0.000
Richer	295 (15)	1727 (85)	0.42 (0.31-0.58)	0.000
Richest	297 (16)	1539 (84)	0.41 (0.29-0.57)	0.000
Head of household				
Male	836 (12)	6043 (88)	1	
Female	328 (10)	2912 (90)	1.32 (1.09-1.60)	0.005
Place of residence				
Urban	777 (12)	5821 (88)	1	
Rural	387 (11)	3134 (89)	1.02 (0.80-1.30)	0.853
Ecological zone				
Terai	736 (15)	4054 (85)	1	
Hill	404 (9)	4147 (91)	1.69 (1.33-2.15)	0.000
Mountain	24 (3)	754 (97)	4.82 (2.64-8.82)	0.000

Statistics shown are adjusted for the cluster design and population weights

Multivariate analysis

Table 4 shows the results of the multivariate analysis, based on a logistic model that adjusted all variables shown in Table 3 except for Media exposure and Place of residence. The strength of most of the associations decreased when the other variables were accounted for, but the ones showing a dose-response relationship under a bivariate analysis, continued to do so, even after adjusting for other variables: TB knowledge, age, wealth, and ecological region. The various barriers to seeking health care at a public facility were statistically significant, but their effect size was relatively small, including whether women viewed distance from a public facility as being a big problem or not.

The adjusted odds of women having good TB knowledge preferring the public health facility were nearly two times more than women having poor TB knowledge. The adjusted odds ratios (aOR) for selecting a public health facility were 1.50 and 1.90 for women having fair TB knowledge and good TB knowledge, respectively. The odds of women selecting a public health facility increased with the increasing age of women. The odds of women choosing a public facility increased with the residents of the mountain region for the diagnosis and treatment of TB. Muslim women were less likely to prefer the public health facility than Brahmin/Chhetri caste women. The odds of women choosing a public health facility decreased with increasing household wealth.

Table 4. Multivariate binary logistic regression results

Characteristics	Private health facility n (%)	Public health facility n (%)	aOR (95% CI)	p-value
Knowledge of TB				
Poor	600 (14)	3564 (86)	1	
Fair	408 (10)	3653 (90)	1.57 (1.31-1.88)	0.000
Good	156 (8)	1738 (92)	1.97 (1.58-2.44)	0.000
Media exposure				
No	121 (8)	1384 (92)	1	
Yes	1043 (12)	7571 (88)	1.07 (0.83-1.37)	0.605
Distance to health facility				
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Freedom to go health facility				
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Statistics shown are adjusted for the cluster design and population weights

Discussion

To our knowledge, this is the first analysis of the NDHS 2016 women's dataset focusing on the type of health facility preferred for a diagnosis and treatment of TB. The results of the analysis suggest that the lack of TB knowledge, close distance to the health facility, younger age, women's caste/ethnicity, unemployment, poverty, and difficult terrain were factors that significantly affected women's choice of the type of health facility for the diagnosis and treatment of TB.

The present study shows that women having good TB knowledge were more likely to prefer the public health facility for the diagnosis and treatment of TB. The public health facility preference of women increased with the knowledge of TB. A study conducted in Somalia [18] outlined a similar result to our present study. The Somalia study showed that more knowledgeable women were more likely to prefer the public health facility for TB services. Women with good knowledge of TB are probably more conscious of the seriousness of incomplete treatment and the adverse consequences of inappropriate regimens of TB disease can be a reason of women preferring the public health facility.

We detected a dose-response effect of age on women's decision choosing the preferred health facility for the diagnosis and treatment of TB. Results of the study suggests that the women's preference increased for using the public health facility with the increasing age of women, which was consistent with the findings of a study conducted in western China [13]. Their study showed that older women used public health facilities more than younger women. In Nepal, 20% of identified TB cases were in the 15-24 age group [10], but our study showed that a preference of public facilities for TB services was comparatively low among the same age group of women. Similarly, a woman infected with TB faces high social stigma, which is especially problematic for young women for seeking medical services, increases the risk of exclusion or rejection from her husband and family, and reduces the chance of single women getting married [19].

The present TB study result reveals that women from the highest wealth groups were less likely to prefer a public health facility for the diagnosis and treatment of TB. A reason for not preferring the public health facility by the richest women could be a social stigma. A systematic review study result suggested that women diagnosed with TB disease faced more social challenges than men [20]. Another possibility of not preferring the public health facility by the richest women could be the women's misunderstanding toward the public health services providers, because they may think the public service providers do not maintain the privacy of TB patients. In addition, women belonging to the higher economic status groups are comparatively more autonomous to make decisions where to go for treatment and better able to afford the cost of treatment at private facilities. The result of the present study is similar to a study conducted in Myanmar [21], which showed that women with higher income were more likely to utilize private health service providers for TB services. A study conducted in Nigeria showed that women who fell in the lowest income group were more likely to use a public health facility [14], which is similar to our findings.

In the present study, Muslim women's preference to choose the public health facility was lower than other groups of women (Brahman/Chhetries, Jana jaaties, and Dalits caste). This could be because of cultural preferences [22]. Muslim culture is rigid regarding women interacting with male service providers. Moreover, the privacy in public health facilities are poorly maintained so that Muslim women may have preferred private health facilities. For instance, Muslim women's preference for utilizing the public health facility for other healthcare, such as maternal health services, was less as compared to women belonging to other social groups [23].

Furthermore, we found that women in the mountain region were much more likely to prefer public facilities. The explanation could be the negligible presence of private sector facilities in the rural and mountain region, because nearly all private health facilities are located in urban areas.

The present analysis was conducted using a nationally representative data sample from the NDHS 2016; so that we inherit some of the limitations due to the nature of NDHS data. The NDHS dataset is based on questions on socio-demographics, diseases, maternal, child health, family planning, and other several sectors of health and services which were more general, rather than specifically tailored to an issue or research question. Therefore, the NDHS dataset did not provide in-depth information about the factors that affect women's healthcare-seeking behavior, like health facility opening hours, drug availability, attitudes and behaviors of service providers, provision of privacy, and the cost of treatment. Those missing factors aside, we expect our findings to generalize to the entire Nepali population and support to government decision-making in improving the universal coverage of TB services and address the issue of undetected TB cases in Nepal.

Conclusion

The findings of the study show the majority of women in the study sample preferred a public health facility for the diagnosis and treatment of TB. Inadequate TB knowledge, women having family restrictions to go to a health facility, unable to go alone, younger age, unemployment, and social stigma were found to be some major factors for influencing women's decision choosing the public health facility for the diagnosis and treatment of TB. We believe the findings of the analysis will help policy makers and program managers to develop an awareness raising plan focusing on groups that showed less likelihood of preferring public health facilities for TB services. Our present study suggests some new insights: younger, wealthier, and Muslim women are less likely to prefer public health facilities for the diagnosis and treatment of TB. Therefore, we strongly recommend conducting further studies to confirm the results of the present TB study and implementing awareness-raising interventions focusing on younger Muslim and wealthier populations.

Abbreviations

TB: Tuberculosis, NDHS: Nepal Demographic and Health Survey, aOR: Adjusted Odds Ratio, SD: Standard Deviation, NTP: National Tuberculosis Program, MDR: Multi-drug resistance, NGO: Non-governmental Organization

Author's contribution

TS conceived and designed the study. TS led the process of data acquisition and RM contributed to data extraction, analysis, and interpretation. HD provided input in study design, data analysis, and interpretation. TS prepared the manuscript and HD commented and provided inputs for finalization. All authors reviewed and approved the final version of the manuscript.

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Ethical approval

Since we used publicly available secondary data of the NDHS 2016 following a formal request to the DHS program, and respondents were not identified, no ethical approval was needed.

Conflict of interest

The authors declare that no conflict of interest exists.

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