Utilization of Eye Health Services in the Mountainous Population of Nepal

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**Abstract**

The low utilization of eye health services is the major challenges for reduction of visual impairment and blindness in mountainous population of Nepal. The objective of the study was to determine the status and associated factors of utilization of eye health services in mountainous population.

**Materials and method**

Population-based cluster random sampling method was applied to select the study populations from two mountainous districts. The study population was 2,050 subjects. Forty-one clusters were selected based on probability proportion to size sampling procedure. A trained ophthalmic assistant conducted an interview of the respondent of 18 years and above at house to house visit by using a semi-structured questionnaire.

**Results**

A total of 48.4% respondents used the health service facilities for their eye checkup and treatment. Among them, 84.7% respondents used the eye health service facilities; 6% respondent private health clinics/pharmacy and 2.2% respondent non-allopathic health. The respondents of 58.4% were female, 55.6% respondents from the age of less than 50 years and 26.9% illiterate. The association of eye health service utilization with available health services, gender, age and literacy are found to be statistically significant (p<0.05).

**Conclusion**

About thirty percent of respondents used eye health services from the available eye health service facilities within districts. The respondents from illiterate and older age group were found to be poor user of available eye health service institutions for their eye checkup. An appropriate programs need to take such factors into consideration as they design eye health service plans.

**Keywords**

Mountainous people; eye health service; utilization; Nepal

**Introduction**

In Nepal, about 26.49 million populations, without a social healthcare system, over hundred thousand people are blind [1]. Estimated more than 90% of blind people reside in remote areas where often have limited or no eye health services facilities [2-4]. Majority of them from rural areas who require eye health services merely use existing eye health service facilities [5].

The eye health services are available in each headquarters of all districts in the country. Mustang and Manang districts also have access to permanent set up of primary eye health services through community eye centres at the headquarter of both districts. Furthermore, periodic surgical eye camps and community screening eye programs have been conducted in rural villages of both districts. At this point in time, the numbers of eye health service users are over 15.56% of demand population for eye health services in the country [6].
The utilisation of available eye health services is mandatory for reduction of the burden of visual impairment and blindness [7, 8]. In Nepal, NGO runs over ninety percent of eye health service institutions [2]. Though eye health service providers are performing well, the majority of them are located in the bigger city and urban area. Most of the districts from hills and mountain regions are far from eye health services except the primary level of eye health services and periodic eye camps. Therefore, utilization of available eye health services is major challenges especially in mountainous population of Nepal. In this context, the study was designed with the objective of identifying the status and associated factors of eye health service utilization of people in mountainous districts in Nepal. The finding of study would play a significant role in planning effective eye health program to covering a wide range of population by maximizing the existing resource.

Material and Method

It is population based cross-sectional and cluster random sampling method. The study population was 2,050 subjects (12% of the total population of two districts) of all age groups from 41 clusters. The sample size was calculated by using the sample size calculation formulae in confidence interval of 95% [9]. The formulae was sample size \(n = \frac{Z^2 \times p \times (1-p)}{d^2}\) (Where, \(Z\) = Standard normal variant =2 for 95% confidence, \(P\) = prevalence rate, \(d\) = absolute error). By applying the reference prevalence of 2.6% in formulae, Sample size \(n = 4*\frac{0.026*0.974}{0.01*0.01} = 413\). It was used the design effect of 2 to select the most representative sample population. In the calculation, the required sample size was 1013, after applying the design effect of 2 in the sample size, the proposed sample size was 2026 (sample size =1013*2 = 2026). The study population was selected based on probability proportion to size (PPS) sampling procedure. According to Rapid Assessment of Avoidable Blindness (RAAB)’s manual, the proposed sample population was 50 individuals in each cluster [10]. Thus, total sample population was taken 2,050 and the required cluster number was 41 (required cluster number \(k\) = 2026/50 = 41). The required sampling interval (SI) was 425 which was calculated by dividing total population of study districts by cluster number \((SI=17,410/41=424.63=425)\). The ward of village development committee was taken as a cluster. In each cluster, the population was divided into segments. One segment was randomly selected from each cluster and 50 individuals were randomly selected as subject populations from the selected segment.

A semi-structured questionnaire was developed in English language and that was translated into Nepalese language and tested by an expert. The data collection was performed by conducting the face to face interview with respondent. A trained ophthalmic assistant conducted an interview of the respondent of an age of 18 year and above at house to house visit by using a semi-structured questionnaire. For children below 18 years, their guardian or parents were interviewed.

The collected quantitative data were entered into online Google data base software by ophthalmic personnel in headquarters of districts. The data cleaning and data analysis were performed by using SPSS software version16.5 (SPSS Inc. Chicago, USA) at TIO.

This study was approved by the Institutional Review Committee of Tilganga Institute of Ophthalmology. The respondent age of 18 years and older were taken written consent prior to interview and children less than 18 years old were taken from their parents or guardian whoever was present.

Results

A total of 2,050 respondents participated in this study. More female respondents (58.2%) participated in the study from both Districts. Over fifty-six percent of female respondents were from Mustang and over sixty percent were from Manang District. Sixty-six percent of respondents were from less than fifty years and thirty-four percent were from fifty years and above. The mean age of respondent was 37.96 years (standard deviation (SD) 21.85 years). A total of twenty-six percent of respondents were illiterate.

<table>
<thead>
<tr>
<th>Response</th>
<th>Mustang n,%</th>
<th>Manang n,%</th>
<th>Male n,%</th>
<th>Female n,%</th>
<th>Total n,%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sought</td>
<td>663,66.8</td>
<td>329,33.2</td>
<td>413,41.6</td>
<td>579,58.4</td>
<td>992,48.4</td>
</tr>
<tr>
<td>Not sought</td>
<td>687,64.9</td>
<td>371,35.1</td>
<td>444,42</td>
<td>614,58</td>
<td>1058,51.6</td>
</tr>
<tr>
<td>Total</td>
<td>1350,65.9</td>
<td>700,34.1</td>
<td>857,41.8</td>
<td>1193,58.2</td>
<td>2050</td>
</tr>
</tbody>
</table>

p-value >0.05

A total of 48.4% (992) respondents utilized the available health service institutions for their eye checkup and treatment. Among them, 66.8% (663) of respondents were from Mustang and 41.6% (329) of respondents were

Table 1: Eye health service utilization of respondents by location and gender in the study population (n=2050)

n-data presented as number of respondents,%
from Manang District (table 1). Similarly, 413 (41.63%) of respondents were male and 579 (58.4%) female; 552 (55.6%) were from age group of less than 50 years and 440 (44.4%) were from age of 50 years and above; and 707 (73.1%) were literate and 261 (26.9%) were illiterate group of respondents (table 2). The association of health service utilization with both location and gender were not found to be statistically significant (p>0.05) (table 1). Among the eye health service utilized respondents, 84.7%(840) respondents used the eye health service institutions (i.e. 28.3% in community eye center of Mustang and Manang, 29.8% in eye hospital and other eye centres and 26.5% in eye camps), 7.1%(70) respondents used the general health institutions (i.e. public hospital, primary health center, health post etc.), 6.0%(60) respondents used private health clinics or pharmacy and 2.2%(22) respondents used non-allopathic health services and traditional healers for their eye checkup. Among eye health institution users, 84.7% (840) respondents used from the available eye health service institutions within their own districts i.e. community eye centres at the headquarters or both districts. Similarly, 58.7% (165) of female respondents and 41.3% (116) of male respondents used the available eye health service institutions for their eye checkup and treatment (table 2). A total of 69.0% (194) respondents of the age of less than 50 years and 31.0% (87) respondents of 50 year and above used available eye health service institutions for their eye checkup (table 2). Similarly, 81.0% (222) of literate respondents and 19.0% (52) illiterate respondents used eye health institutions for their eye checkup (table 2). The associations of eye health service utilization with available health service facilities, gender, age, and literacy were found to be statistically significant (p<0.05) (table 2).

<table>
<thead>
<tr>
<th>Particular</th>
<th>Male</th>
<th>Female</th>
<th>Illiterate</th>
<th>Literate</th>
<th>&lt;50 years</th>
<th>&gt;50 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>^CEC, Mustang/ Manang</td>
<td>116</td>
<td>165</td>
<td>52</td>
<td>282</td>
<td>84.7%</td>
<td>15.3%</td>
<td>281.283</td>
</tr>
<tr>
<td>Eye hospital/ eye centre (other)</td>
<td>142</td>
<td>154</td>
<td>94</td>
<td>201</td>
<td>84.7%</td>
<td>15.3%</td>
<td>296.298</td>
</tr>
<tr>
<td>General health institution</td>
<td>27</td>
<td>43</td>
<td>14</td>
<td>50</td>
<td>84.7%</td>
<td>15.3%</td>
<td>70.71</td>
</tr>
<tr>
<td>Private clinic/ pharmacy</td>
<td>31</td>
<td>29</td>
<td>8</td>
<td>54</td>
<td>84.7%</td>
<td>15.3%</td>
<td>66.0</td>
</tr>
<tr>
<td>Eye camp</td>
<td>92</td>
<td>172</td>
<td>89</td>
<td>164</td>
<td>84.7%</td>
<td>15.3%</td>
<td>22.2</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>17</td>
<td>4</td>
<td>18</td>
<td>84.7%</td>
<td>15.3%</td>
<td>22.2</td>
</tr>
<tr>
<td>Total</td>
<td>413</td>
<td>579</td>
<td>261</td>
<td>707</td>
<td>84.7%</td>
<td>15.3%</td>
<td>992.100</td>
</tr>
</tbody>
</table>

Discussion

In this study, less than half (48.4%) of respondents utilized the available health service institutions for their eye checkup. Similar findings were also reported in the studies conducted in Aravind and Ghana study [5, 11]. Among health service users, 84.7% of respondents used the eye health institution which could be taken as a positive sign of better awareness of respondents on eye health services. However, over 50% of the respondents reported on the utilization of available eye health service facilities within their own districts (i.e. community eye centers or eye camps), one-third of respondents had reported that they visited outside of home district for their eye checkup. The reason of that could be lack of information about available eye health service institutions or quality of services offered at those facilities. The questions regarding reasons for not using available eye health services and traveling to outside of districts for eye checkup were missed in this study. This is one of the limitations of this study.

Though there was a negligible number of the respondent who used non-allopathic health facilities and visited traditional healers for their eye checkup, it is still worthwhile to take note that people need to be educated about modern eye health services to change their behavior in the eye health service utilization. This will play an important role to reduce visual impairment and blindness in the population. Surprisingly, the higher number of female respondents (58.3%) used the eye health services for their...
eye checkup and treatment in this study. The reason of that could be the high numbers of female people reside in the community. This was also observed in the strong association of educational status and female with the eye health service utilization (p<0.05). Thus, this indicates that both groups of people (gender) have to be educated to improve the eye health service utilization level in the study population. Similarly, less number of respondents (31.0%) of 50 years and above used available eye health service institutions for their eye checkup, which could be another area of improving the behavior of people in using available eye health services for their eye checkup. Similar findings were reported in two studies conducted in rural India, where 64% of people aged 40 years and older and 55% of people aged 60 years and older reported never had an eye checkup [5, 11]. In another study conducted in Tehran, Iran, the eye health service utilization level was reported in more than 85% of adults aged 60 years and older used available eye health service for their eye checkup [12]. The reason of high utilization of eye health service in Iran could be due to high literacy level and good economic status of the respondents. In this study, the reason for low utilization level could be assumed that low access and awareness on available eye health service facilities. This study carries some limitations. First, this study was conducted in two districts of mountainous regions. Therefore, caution should be exercised when generalizing these results to a diverse population. Second, participants were asked if they used eye health service facilities, where did they go, but they were not why they chose those places. Third, though it is challenging collection of information on the economic status of the participant, that is an important factor to influence the behavior of participant to seek health services. That is missed out in this study. Despite these limitations, this study adds to the literature on the event-level relationship between eye health seeking behavior and service facilities, specifically by including the population-based sample, stratifying by gender, age and literacy.

**Conclusion**

In conclusion, about thirty percent of respondents used eye health service facilities within districts. Similarly, the respondents from Illiterate and older age were found to be poor user of eye health services for their eye checkup. The link between utilization behavior and eye health services is multifaceted and encompasses several other important factors including the level of available eye health services in the community. An appropriate programs need to take such factors into consideration as they design eye health service plans.

**References:**