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## MEDICATION UTILIZATION PROBLEM AMONG BLIND POPULATION IN NEPAL

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**ABSTRACT: Background:** Studies on challenges of the visually impaired population during medicine utilization, their difficulties and the Pharmacist's information assessment towards such population are very limited. **Objective:** To study the problems during medicine utilization among blind patients in Nepal. **Methods:** A cross-sectional descriptive study was carried out in 120 blind persons using a schedule at various blind associations, hostels, colleges, and a blind cricket tournament. Participants of at least 18 years and had taken 2 medicines were included in the study. SPSS was used for analysis. **Results:** We found 60% could read Braille alphabet with most were male (63.88%) population. We found 21.43% only had adherence in their medicines. Most people had faced problem while using liquid dosage form where 46.7% of people spilled drug during administration and even 12.5% administered the drug directly from the bottle. The information given by dispenser was found to be inadequate. We found 65.8% of participants didn't get to know their medicine name, staggering 80% haven't got their medicine expiry date, 60% haven't known their medicines indication, and 75.8% didn't get any precautions related to their medicines. **Conclusion:** This population has been facing various medicine-related difficulties along with inadequate dispensing information. Results of the Morisky scale showed a lack of adherence in such population.

**INTRODUCTION:** Blindness or visual impairment is a decrease in ability to see to the degree that causes problems not fixable by visual means, such as glasses (WHO). Globally it is estimated that in 2015, 36.0 million were blind and 216.6 million people had moderate to severe visual impairment. A study predicted the increase in the number of blind people to 38.5 million by 2020 and 115 million by 2050. <sup>1</sup> Globally, uncorrected refractive errors are the main cause of visual impairment and cataract is the leading cause of blindness <sup>2</sup>.

A nationwide population-based survey (Nepal Blindness Survey) on blindness and visual impairment were done in 1980-1981 which showed 0.84% prevalence of blindness. The causes of blindness were cataract (66.8%) followed by corneal scars (8.4%), glaucoma (3.2%), trachoma (2.4%) and posterior segment diseases (13.9%) <sup>3</sup>.

Nepal had launched the Vision 2020 program in 1991 with objectives to eliminate avoidable blindness by the year 2020 and establish sustainable eye care systems integrated with the general health care system. The latest survey showed the prevalence of blindness (all ages) reduced from 0.84% in 1981 to an estimated 0.35% in 2011, a reduction of 58%. The number of blind persons reduced from 117,600 in 1981 to an estimated 93,400 persons of all ages in 2010, 20.6% less <sup>4</sup>. Visually impaired persons have various medicine management problems where they may

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take wrong medication or incorrect doses of medication resulting in serious consequences, including overdose or inadequate treatment of health problems. Such population usually needs to seek help from family members, caregivers or partners, rely on their memories, and use of assisting device in managing their medications<sup>5</sup>. A study from Bangkok has shown problems with identifying medications and doses, taking medications at the right time and recognizing expired medications<sup>6</sup>. McCann RM *et al.*, have found only 52.6% of VI patients reported perfect adherence on Morisky scale<sup>7</sup>. Recent studies from Malaysia found most of the visually impaired individuals did not receive appropriate assistance regarding medicine use and having low awareness of medication management.

Medication adherence is defined as the extent to which a patient's behavior is taking the medication prescribed by the physician changes after therapeutic plan agreement is established between patient and physician. Adherence level of the patient will focus on patient's drug-related problems which can be resolved. Medication adherence can be assessed by either indirect or direct methods whereas direct methods to assess adherence are direct observed therapy and measurement of the level of medication or metabolite and biological markers in the blood. And indirect methods include patient self-reporting, records of drug refills, pill counts, patient's treatment response assessment and the use of electronic medication-monitoring devices<sup>8</sup>. There is no available published research on medication utilization problem among the blind population in Nepal. This limits the ability of health providers and health policy makers to plan and provide for medicine-related needs of this population. The objectives of our study were to found the challenges on medicine use, the effect of blindness on the ability to take medicines, information provided by the pharmacist while dispensing the medicine, assessment of medication adherence through Morisky scale, and solution to improve medicine use in participants.

## METHODS:

**Study Design and Settings:** A cross-sectional descriptive study was conducted in various parts of Kathmandu, Lalitpur and Bhaktapur district.

Participants were from various blind associations, hostels, colleges and a national level inter provisional blind cricket competition which was held in Kirtipur.

**Study Period:** The study was performed for a period of 6 weeks.

**Ethical Approval:** The ethical approval was obtained from the Institutional Review Committee of Manmohan Memorial Institute of Health Sciences (Reference no. 75/65) before the commencement of the study.

**Selection Criteria:** Participants who have used at least 2 medicines and are of not less than 18 years old of both sexes were included.

**Sampling Technique:** Purposive and snowball non-probability sampling technique.

**Study Population:** 120

**Data Collection and Study Procedure:** The schedule was presented in written form and conducted face to face by the interviewer. Schedule was developed from the available published article on this topic<sup>5,6,9</sup> and validated from experts. Total 5 groups of questions were developed which represent the medication problems on blind populations. We assessed the medication adherence of blind patient by validated Morisky medication adherence scale (MMAS-8 item)<sup>10</sup>. The level of adherence was then classified as high adherence (8), medium adherence (6-8) and low adherence (below 6)<sup>10</sup>.

**Statistical Analysis:** The data are presented in frequencies and percentages. The analysis was performed using SPSS version 16.00.

## RESULTS:

### Demographic Profile:

**Sex and Visual Impairment:** The extent of visual impairment and sex is shown in **Table 1A**. Among 72 males, 31 had some sight in which only 16 were able to read Braille alphabet while 30 with no sight in total 41 were only able to learn Braille alphabet. In the same way, among 48 females, 19 had some sight in which only 9 were able to read Braille alphabet while 17 with no sight in total 29 were only able to read Braille alphabet.

**TABLE 1A: SEX AND VISUAL IMPAIRMENT**

Sex		Extent of visual impairment (Frequency)			Total
		Some sight	No sight		
Male	Ability to read	Yes	16	30	46
	Braille alphabet	No	15	11	26
Total			31	41	72
Female	Ability to read	Yes	9	17	26
	Braille alphabet	No	10	12	22
Total			19	29	48

**Education and Sex:** The education and sex distribution of the study population was as summarized as **Table 1B**. In our study, we found 18 male and 7 females had completed their masters. Similarly, 13 males and 18 females had completed their bachelors. In the way, 13 males and 7 females had completed +2 levels. We found 16 males and 6 females had completed SLC education. Likewise, we found 12 male and 4 female had only studied below 8 classes. We also found 6 uneducated females.

**TABLE 1B: EDUCATION AND SEX**

Education	Sex		Total
	Male	Female	
Master	18	7	25
Bachelor	13	18	31
10+2 level	13	7	20
SLC	16	6	22
Below 8	6	3	9
Below 5	6	1	7
Non-educated	0	6	6
Total	72	48	120

**TABLE 1C: LIVING ARRANGEMENT AND VISUAL IMPAIRMENT**

Living arrangement	The extent of visual impairment		Total
	Some sight	No sight	
On your own	9	10	19
With family and friends	37	52	89
Special facility	4	8	12
Total	50	70	120

**Living Arrangement and Visual Impairment:** The living arrangement and extent of visual impairment are shown in **Table 1C**. We found the majority of the population (N=52) with no sight

living with family or friends. In contrast, 10 with no sight were living on their own. We also found that 8 with no sight were living in special facility.

**TABLE 1D: AGE GROUPS AND BELIEF IN SYSTEM OF MEDICINE**

Age groups	Belief in the system of medicine		Total
	Allopathic	Ayurvedic	
Under 20	12	6	18
21-30	34	23	57
31-40	24	9	33
41-50	4	4	8
Above 50	3	1	4
Total	77	43	120

**Age-Group and System of Medicine:** We found 77 blind populations believe in an allopathic system of medicine and 43 were believed in the Ayurvedic system of medicine.

also found people keeping different drugs in a different place (32%). We found 78.3% were able to identify the different dosage form while 21.7% were not able to. We found 80% were able to open the medication container and 20% weren't able.

**Challenges in Medicine Usage:** The challenges of the blind population were summarized as in **Table 2A** and **2B**. In 120 people, most people tend to put touchable differentiating marks on their medicine package (40%) followed by 32.5% of people use assistance from normal vision people. Likewise, we

In our study, we observed 87.5% of people were able to self administrate their medicine and remaining (12.5%) could not. We observed 65% of people goes to buy their medicine without any caregiver while the rest (35%) depends upon their

caregiver for buying. 88% had never felt cheated from the dispenser while 26.7 felt cheated. 83.3% had never felt any kind of discrimination by dispenser while rest (16.7%) had felt some discrimination. We found more than half (51.7%) had missed their dose earlier. We observed

awareness in the expiry date among the blind population. Most (72.5%) of them tend to ask the expiry date using assistance from another normal vision person. 27.5% of people had felt some difficulties in the storage of medicines while the majority (72.5%) felt no difficulties.

**TABLE 2A: CHALLENGES OF MEDICINE USE**

S. no.	Challenges	Frequency	Percentage
1	How you identify medicine?		
1a	Assisted by persons with vision	39	32.5
1b	putting a touchable differentiating mark on the package	48	40
1c	keeping different drugs in different place	32	26.7
2	How you identify the expiry of medicine?		
2a	Assisted by person	87	72.5
2b	Guessing	33	27.5

**TABLE 2B: CHALLENGES WITH MEDICINES**

S. no.	Challenges	Yes (%)	No (%)
1	Can you Identify the dosage form?	94 (78.3%)	26 (21.7%)
2	Can you able to open medication container?	96 (80%)	24 (20%)
3	Can you able to self-administration the given medicine?	105 (87.5%)	15 (12.5%)
4	Have you ever felt cheated by the dispenser?	20 (16.7%)	100 (83.3%)
5	Have you ever missed a dose?	62 (51.7%)	58 (48.3%)
6	Have you ever felt difficulties in the storage of medicine?	33 (27.5%)	87 (72.5%)

**Table 2B** shows that most of the participants had no problem with identifying the dosage form, opening medication container, self-administering medicine or with storage of medicines. Cheating by dispenser was only felt by 16.7% of the participants. However, we found that nearly half of the participants (48.3%) had missed their dose.

**Problem with Liquid Dosage Form:** The main problem as found to be with liquid dosage form, where 46.7% spills the drug while measuring by self. 40.8% were depended on dosing by a caregiver and 12.5% administered the drug by the direct bottle.

**TABLE 2C: DOSING PROBLEM RELATED TO LIQUID DOSAGE FORM**

S. no.	Dosing problem related to the liquid dosage form	Frequency	Percent
1	Spilling of drug while measuring by self	56	46.7
2	dosing by caregiver	49	40.8
3	Administered by the direct bottle	15	12.5

**Effect of Blindness to Take Medicine:** The effect of blindness is summarized in **Table 3**. 24.2% people said they took wrong medicine once or more in their life. 28.3% of people said they had taken the wrong dose of medication. 39.2% of people said they had taken their medicines in the wrong time. In our study, we found some (21.7%) people had taken an expired drug which they came to know later by other normal vision person. Most people (77.5%) had forgotten to take their medicine earlier and among them rarely (36.7%) was the most common answer. We also found 22.5% had never forgotten to take their medicine.

**Information Received During Dispensing:** **Table 4** shows the information received during the dispensing of medicines. More than half (65.8%) dispenser didn't found necessary to tell the medicines name. 82.5% dispenser told the frequency of the dosage to patients. Much (80%) of the dispenser didn't tell the expiry date of the drug.

Most (60.8%) of the dispenser told the indication of medicine. 63.3% get to know about the duration of their therapy. We found most (75.8%) patients don't get to know about the precaution of their medicine.

**TABLE 3: EFFECT OF BLINDNESS ON ABILITY TO TAKE MEDICINE**

S. no.	Effect of blindness	Yes (%)	No (%)			
1	I take wrong medication	29 (24.2%)	91 (75.8%)			
2	I take wrong dose of medication	34 (28.3%)	86 (71.7%)			
3	I take the wrong medication at the wrong time	47 (39.2%)	73 (60.8%)			
4	I take expired drug	26 (21.7%)	94 (78.3%)			
5	I forget to take the medicines					
	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	Always (%)	Total (%)
	27 (22.5%)	44 (36.7%)	38 (31.7%)	10 (8.3%)	1 (0.8%)	120(100%)

**TABLE 4: INFORMATION GAINED WHILE DISPENSING THE MEDICINE**

S. no.	Information	Yes (%)	No (%)
1	Have they told the medicines name?	39 (32.5%)	79 (65.8%)
2	Have they told the frequency of dose?	99 (82.5%)	19 (15.8%)
3	Have they told the expiration of medicine?	22 (18.3%)	96 (80%)
4	Have they told the indication of medicine?	45 (37.5%)	73 (60.8%)
5	Have they told the duration of therapy?	76 (63.3%)	42 (35%)
6	Have they told about the precaution of medicine?	27 (22.5%)	91 (75.8%)

\*non-respondent 2 (1.7%)

**Solution to Improve Medication Use:** In our quest for the most representative solution of medication problems among the blind population, most of the participants recommended for Braille alphabet labeling (35.8%) followed by differentiating mark on drug package (20%). Similarly, 15.8% of people also believed extra

explanation by pharmacist could solve their problem. Likewise, they also suggested for information in an audio format (14.2%), and 6.7% said development of drug reader mobile app could be effective. We also got the recommendation for drug use information pamphlets in the Braille alphabet (5.8%) and Telephone helpline (1.7%).

**TABLE 5: SOLUTION TO IMPROVE MEDICATION USE**

S. no.	Solutions	Frequency	Percentage (%)
1	Extra explanation by the pharmacist	19	15.8%
2	Braille alphabet labeling	43	35.8%
3	Touching differentiating mark on the drug package	24	20.0%
4	Drug use information pamphlets in Braille alphabet	7	5.8%
5	Telephone help line	2	1.7%
6	Availability of information in an audio format	17	14.2%
7	Development of drug reader mobile application	8	6.7%
	Total	120	100%

**Adherence of Population:** In 120 participants 23 participants were suffered from chronic disease. From 23 chronic patient, 14 patients were ready to answer MMAS-8 items. We found 71.43% with low adherence, 7.14% with medium adherence and 21.43 % high adherence.

We found most of the participants with no sight lives with their family and friends while 10 of them live independently. These people could have a problem in medicine administration and their management. Allopathic medicine (64.16%) is more reliable and believed system by the population compared to the Ayurvedic system (35.84%).

**TABLE 6: LEVEL OF ADHERENCES**

Level of adherence	Frequency	Percentage
High adherence (8)	3	21.43
Medium adherence (6-8)	1	7.14
Low adherence (below 6)	10	71.43

**DISCUSSION:** In our study, the majority (60%) of the blind population could read Braille alphabet where most of them were male population (63.88%). In a similar study from Saudi Arabia, 91% were able to read the Braille alphabet.

In Nepal, there is no any special assisting methods for these special group, so they cope with various techniques in which most people tend to put touchable differentiating marks on their medicine package (40%) for identification of drug. In a study by Riewtaiboon A *et al.*, a majority of the participants identify drugs by memorizing the shapes and size of the tablets and capsules they

took<sup>9</sup>. We also found people using their caregiver (40.8%) help while taking liquid dosage form but 46.7% of people take by themselves and have spilled their drug while measuring. We even found 15 people (12.5%) administrating drug directly from the bottle. Chamari L. Weeraratne *et al.*, found a usual problem for these people when pouring liquid medicines and taking out capsules and tablets from blister packs<sup>8</sup>.

Most (36.1%) of the participants said they rarely forget to take their medicine, but in contrast, we found 51.7% have missed their dose earlier in their life. The dispenser has not told the expiry date of medicines to most of the participants (80%) that could be one reason for their seeking of assistance from others (72.5 %) while there were also some participants (27.5%) who guess expiry dates. However, we found 21.7% have taken the expired drug once or more in their lifetime.

Our study shows that dispenser in pharmacy is not giving essential information to our participants. We found 65.8% of participants didn't get to know their medicine name, staggering 80% haven't got their medicine expiry date, 60% haven't known their medicines indication, and 75.8% didn't get any precautions related to their medicines.

We saw various challenges and problems of medication utilization among blind populations, so we prepared 7 possible solutions for them. We asked for recommendations and to choose the best probable solutions with all of our participants where 35.8% wanted Braille alphabet labeling on their medicines, 20% wanted touchable differentiating markings on drug package, and 15.8% recommended extra explanation by pharmacist could overcome their problems. In a similar study on Thailand 77% and Saudi, 91% of blind patients indicated that Braille labeling would help them for improving medicine use. These percentages are higher in comparison with our study where only 35.8% recommended for Braille labeling which could be due to lower Braille reading population.

**CONCLUSION:** This study was necessary to highlight the medication utilization status of the blind population in Nepal, a special population which is often neglected. The study focused and

drew attention to the challenges faced by this population. Based on the results, the following points were concluded.

- Most of the people depend upon touchable markings or assistance from others in the identification of their medicines while some also identify by storing different medicines in different places.
- This population highly relies on assistance for knowing expiry date. Most of the dispenser didn't share the expiry date with them.
- The dosage form like tablets, capsules are easily identified by this population and were able to open the container.
- Liquid dosage form has great problems for this population, so caregiver assistance is required. The major problem is lost of the drug by spilling when trying to measure.
- The dispenser counseling to this special population is only limited to telling the frequency and duration of the medicines.
- Braille labeling could be beneficial solutions for this population.

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**CONFLICT OF INTEREST:** There is no conflict of interest as such.

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