Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps
Chamari L Weeraratne, Sharmika T Opatha, Chamith T Rosa

Background: Difficulties faced by visually disabled people when using medicines, self-adopted coping strategies, and medicine-related mishaps have been under-explored locally and internationally. The objective of this study was to gain insight regarding this long-neglected issue.

Methods: A descriptive cross-sectional study, using an interviewer administered questionnaire on 63 visually disabled adults was carried out at a vocational training centre and a school for visually disabled students in Sri Lanka.

Results: Among 63 participants, 71% wanted to be independent in medicine use and 79% in spite of difficulties had self-administered medicines. They had difficulty in locating medicines (25.39%), identifying medicines and medicine containers (17.46%), and administering liquid medications (25.39%). These difficulties led to inaccurate dosing (14.28%), missed doses (39.68%), and discontinuation of treatment prematurely (28.57%). Self-adopted coping strategies to overcome these difficulties included using different sized and shaped containers, tying medicines to the attire, and dipping their finger into a measuring cup while measuring liquid medicines. Mishaps related to medicines such as taking vinegar instead of gripe mixture and, putting ear drops into eyes were disclosed.

Conclusions: There were many challenges for visually disabled people in taking medicines and some self-adopted coping strategies were inadequate to overcome these.

Key words: Medicine use, blind, visually handicapped, coping strategies, disability, differently-abled, compliance, self-medication.

Introduction
Visually disabled and partially sighted people need to use medicines like their sighted counterparts for many diseases and health conditions. Some are parents and need to give medicines to their children. Those who live separately without the assistance of sighted relatives need to administer medicines by themselves for these purposes.

Visual disability is a global issue. There are 285 million people with visual impairment worldwide. Of them 39 million are blind and 246 have low vision — 90% live in developing countries. The difficulties faced by them in using medicines, and how they dealt with these are largely unknown and underexplored, especially in the developing world even though...
it has been highlighted in an editorial of the *British Medical Journal* as early as 1997.\textsuperscript{2} This limits the ability of health providers and health policy makers to plan and provide for medicine related needs of this special group. This, in turn, leads to poor adherence to therapy and lack of cost effectiveness in medicine use\textsuperscript{3}. Studies have shown that vision is one of the factors affecting the ability to handle medication and that people with visual impairment are more likely to have difficulty in managing medications when compared to people with normal eye sight\textsuperscript{4,5}.

Visually disabled or partially sighted people are potentially more likely to have unsafe practices related to medicine use. This has been highlighted in the final report of the Medicines Information Needs of Older People with Sight Loss (MINOPS study)\textsuperscript{6}.

The objectives of our study were to identify the attitudes regarding independent use of medicines, barriers and limitations to medicine use, self-adopted coping strategies and medicine-related mishaps among visually disabled adults.

The results of the study are presented and discussed to create awareness among health care professionals regarding the nature and extent of the problem.

**Methods**

This descriptive cross-sectional study was carried out on 63 visually disabled persons over the age of 18 years from October 2009 for a period of three months. The vocational Training Centre, Seeduwa and the School for the Visually Disabled, Rathmalana, were selected as the study settings purposively as they were the main institutions in Sri Lanka catering for the academic and vocational training needs of visually disabled people.

Ethics approval was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo. The permission was obtained from the Ministry of Social Services and the institutions where the study was conducted.

Informed written consent was obtained from the participants before the interview was conducted. The information sheet was explained to the participants and their queries were clarified by the investigators.

The study population comprised visually disabled persons 18 years and above. Since this population is difficult to access and were limited in numbers all consenting participants at these two settings that fulfilled the inclusion criteria were included in the study (Table 1).

An interviewer-administered questionnaire developed and pretested by the investigators was used. In addition to questions on socio-demographic characteristics it had open-and close-ended questions to study their medicine use-related attitudes, difficulties faced during medicine use, methods they used to overcome these difficulties, and medicine-related mishaps.

**Results**

Sixty-three out of 65 participants who fulfilled the inclusion criteria were included in the study. Two did not give consent.

<table>
<thead>
<tr>
<th>Table 1: Number of participants from each study setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Training Centre</td>
</tr>
<tr>
<td>School for the blind</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Out of 63 participants, 35% were partially sighted and the rest were blind. While 56% were blind from birth the rest lost their sight later on.

The age of the participants ranged from 18 to 60 years with a mean age of 27.62 years—54% were males, 87% were Sinhalese, while the rest were Tamils. Muslims and other ethnicities were not present in the population covered. The educational level of participants is shown in Table 2.

Out of 63 participants, 68% were students or vocational trainees. Of the remaining 32%, seven were textile workers, 11 were teachers, one was a machine operator, and one was self-employed.

Forty-five of them had the attitude to use medicines independently without any assistance while 18 thought that they would always have to depend on others for medicine-related needs.

Of the 63 participants, 50 have self-administering medication without help from others, while the rest stated that they were completely dependant on their caretakers or other visually abled persons for administration of drugs.

Difficulties they had in drug administration and their coping strategies

Fifty participants who were self-administering medicines faced difficulties in multiple aspects related to drug administration (Table 3). Some have devised their own strategies to cope with these difficulties as described below.

Difficulty locating the drugs

One participant kept the medicine containers near a radio for locating it with its sound. Another participant who had to administer eye drops kept the bottle in his pocket or tied it to his attire (sarong) to enable easy access to it.

Difficulty in differentiating medicine containers

A participant who had to self-administer his medicines when his mother was out for work during the day used different sized and shaped containers to enable identification. His mother put all morning doses of medicines into one container and noon doses into another container of different size and shape. But, on several occasions, he did not take his medicines because he was not able to remember which one was for the morning and which one was for mid-day.

Table 2: Highest level of education achieved

<table>
<thead>
<tr>
<th>Highest level of education achieved</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No schooling</td>
<td>2</td>
<td>3.17</td>
</tr>
<tr>
<td>Grade 1 - 5</td>
<td>5</td>
<td>7.93</td>
</tr>
<tr>
<td>Grade 6 - 9</td>
<td>5</td>
<td>7.93</td>
</tr>
<tr>
<td>Up to GCE O/L*</td>
<td>32</td>
<td>50.79</td>
</tr>
<tr>
<td>Up to GCE A/L**</td>
<td>11</td>
<td>17.46</td>
</tr>
<tr>
<td>University education</td>
<td>8</td>
<td>12.69</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td></td>
</tr>
</tbody>
</table>

*General Certificate of Education (GCE) Ordinary level (O/L)
**General Certificate of Education (GCE) Advanced Level (A/L)
Chamari L Weeraratne et al. Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps

Misidentifying drugs
A participant who had rheumatoid arthritis was on similar-sized indomethacin and omeprazole capsules. Having realized that she had administered the drugs incorrectly several times, she asked the pharmacist to give omeprazole in the original packaging and indomethacin without the original packaging in a plastic container to help identification.

Another participant said that when her caretakers purchased a drug for her of a different brand, she struggled to identify the drug as its shape and size was different from the previous one. For instance she was familiar with the size, shape and surface marking of a particular brand of paracetamol. When she received other brands of paracetamol, she could not identify it.

Taking the incorrect dose
Taking half a tablet was a great challenge for most of them. Those who were able to break a tablet said that sometimes the two halves of the tablet were not equal and it got crushed or fell on the floor.

Difficulty in tracking
Those who were on long-term medication had a routine associated with meals which they had developed over time. A few participants were using speaking watches. The others were assisted and reminded by people with sight at school, home or work place.

Missing doses
The most common reason was inability to keep track of time for administering medicine. Some participants forgot to administer the drugs when their daily routine was interrupted. Another reason for missing the drug dose was the caretaker not being at home and not keeping the drugs at a particular place or container for the participant to take.

A 50-year-old patient with rheumatoid arthritis usually managed to take six medicines on her own. She differentiated her drugs based on the shapes and sizes of tablets and the nature of the packaging. However, sometimes she forgot the day of the week and had missed taking methotrexate and folic acid prescribed to be taken on particular days of the week.

Spilling and losing medicines
This was a usual problem for these people especially when pouring liquid medicines and taking out capsules and tablets from blister packs.

Difficulty in taking the full course of treatment
It was difficult for them to complete the full course of treatment prescribed. The majority stated that they stopped the medication as soon as they felt better because they found it difficult to self-administer medicines and did not want to bother their relatives.

Table 3: Barriers to effective medicine use

<table>
<thead>
<tr>
<th>Barriers to effective drug administration (n=63)</th>
<th>Number who faced each barrier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couldn’t locate the drugs</td>
<td>16</td>
<td>25.39%</td>
</tr>
<tr>
<td>Couldn’t identify separate drug containers</td>
<td>11</td>
<td>17.46%</td>
</tr>
<tr>
<td>Didn’t know the correct dose</td>
<td>4</td>
<td>6.34%</td>
</tr>
<tr>
<td>Couldn’t keep track of time to take medicines</td>
<td>13</td>
<td>20.63%</td>
</tr>
<tr>
<td>Had difficulties in using liquid medication</td>
<td>16</td>
<td>25.39%</td>
</tr>
</tbody>
</table>

WHO South-East Asia Journal of Public Health 2012;1(3):256-267
Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps

Chamari L Weeraratne et al.

Difficulty in taking liquid medication

One participant said that she spilled the medicine when she measured liquid medication with a spoon. To prevent this she kept her fingers around the edge of the spoon and poured the syrup until her fingers felt the liquid but took a lesser volume than prescribed.

Another participant said that her mother taught her to measure syrup with a measuring cup with her finger dipped inside to feel the level of the liquid.

Difficulty in administering medicines to children

A visually disabled couple said it was a great challenge administering medicine to their children especially when they were given liquid medicines by the doctor. They attempted to use a measuring cylinder with marks engraved inside it corresponding to different volumes and a dropper for this purpose.

Another participant said that she used a cap of a bottle to measure liquid medicines for her child. Initially her mother poured the prescribed volume of syrup into the cap and taught her to count the number of lines in the cap above the liquid level.

One participant stated that the doctor once prescribed a quarter of a tablet to be given at a time. He found it very difficult to divide the tablet properly. Furthermore, he had to crush the tablet and dissolve it in water to give it to the baby. He was not sure whether he gave the prescribed dose or whether he lost part of the dose in the process. He stated that doctors need to be more considerate when prescribing medicines to people with poor vision.

One participant said that when he went to buy drugs for his three children, he told the pharmacist to give clear instructions and while the instructions were given he made some marks on the paper bag containing the drugs. For instance, if the drug had to be taken three times a day he tore the flap of the bag three times. If only half a tablet needed to be taken he folded the bag into two to made a crease that he could feel. He put the drugs in three separate pockets of his trouser to prevent them getting mixed up.

Another problem faced by visually disabled parents was that they were not able to make out whether the child had swallowed the drug or not. A father of three said that he once gave a tablet to his daughter which she had thrown on the floor while pretending to swallow it. Later, his toddler son found it and attempted to swallow it.

Difficulty in identifying errors made by drug dispensers

A 31-year-old was given a bottle of ear drops instead of eye drops by a drug dispenser. He felt irritation in his eyes after using the drops. He showed the bottle to his friend who discovered that it was a bottle of ear drops.

Difficulty in remembering instructions

Some participants initially asked someone to read out the instructions in the prescription and remembered them. Most of them administered the drugs a few times under observation of a caretaker before self-administering.

Non-availability of caretakers

Those who depended on a caretaker for drug administration said they had missed their doses of medicine when the caretaker was not available.
Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps

Chamari L Weeraratne et al.

Table 4: Medicine-related mishaps

<table>
<thead>
<tr>
<th>Medicine related mishaps</th>
<th>Number who had each mishap</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have taken the wrong medicine</td>
<td>8</td>
<td>12.69%</td>
</tr>
<tr>
<td>Have taken the wrong dose</td>
<td>9</td>
<td>14.28%</td>
</tr>
<tr>
<td>Missed a dose/ doses</td>
<td>25</td>
<td>39.68%</td>
</tr>
<tr>
<td>Have spilled the medication</td>
<td>22</td>
<td>34.92%</td>
</tr>
<tr>
<td>Couldn’t complete the full course of treatment</td>
<td>18</td>
<td>28.57%</td>
</tr>
</tbody>
</table>

Medicine-related mishaps

A 19-year-old boy once accidentally took vinegar instead of gripe mixture for a stomach ache. His condition worsened after taking the liquid (Table 4).

An 18-year-old epileptic had difficulty when he was given a tablet for fever which was similar in size and shape to his antiepileptic drug. He had mistakenly taken the fever tablet instead of his anti-epileptic drug for several days.

A participant once mistakenly swallowed several tablets of the same medicine from a container assuming that they were his midday drug doses.

A 21-year-old boy said that he once took three tablets at a time of a medicine when he should have taken only one tablet at a time.

Another participant stated that to overcome the difficulty of self-administering medicines at different times she once swallowed all the antibiotic capsules for cough in one go.

A participant with diabetes had a drug overdose when a friend brought drugs for him from the pharmacy and gave incorrect instructions for using them.

Discussion

This study has brought to light a neglected and underexplored public health issue relating to a group of health consumers in our society.

It is noteworthy that contrary to the common belief that visually disabled persons liked to depend on others for their day-to-day needs, 71% of them wanted to be able to use medicines independently. However, 21% did not have the self-confidence to become independent and were completely dependent on others. According to a study in Thailand, a similar percentage (17%) took assistance from others for drug administration.

Depending on others for their medicine-related needs was associated with certain problems like non-availability of caretakers at times to assist them. It was also noted that the instructions on using medicines given by caretakers were sometimes incorrect.

The 79% who have self-administered medicines have faced many difficulties. They have adopted several coping strategies but these were incomplete and did not address most of their difficulties and needs. In the Thailand study, a majority of the participants tried to memorize drug information they received and memorized the shapes and sizes of the tablets and capsules they took. Challenges faced by persons who are blind or have low vision in obtaining safe health care and suggestions to overcome these have also been reported from an American setting in 2004.

The study participants had difficulties in accurate and safe administration of medicines. Some medicine-related mishaps were of a
Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps

Chamari L Weeraratne et al.

serious nature such as taking a corrosive liquid instead of the medicine and administering ear drops to the eyes by mistake. Medicine-related mishaps of a serious nature have likewise been reported in the MINOPS study where a visually disabled diabetic was admitted to hospital with hypoglycaemia as he had mistakenly taken his fast-acting insulin instead of the slow-acting one because both vials were similar in shape and size.\(^6\) It has been mentioned in the same study that patients who recognized their drugs by their shape and size faced difficulties when the shape and size of the tablets dispensed to them had changed. This was highlighted in our study as well. These difficulties and possibilities for mishaps need to be noted and strategies should be designed and developed to overcome them.

Difficulties in administering medicines have led to under-dosing, overdosing, missing out of doses and not completing treatment courses. This would adversely affect the outcome of acute serious medical conditions such as pneumonia and long-term health issues such as diabetes, asthma, hypertension, and epilepsy.

Many countries in the Asia Pacific region including Sri Lanka have poor insight at present even as to the existence of such medicine-use-related issues among visually disabled persons. Our health-care systems have not identified or developed methods to overcome them. The health professionals are poorly trained and lack the necessary awareness to handle the special requirements of this group.

Limitations

This study included only two settings with a limited number of participants. Even though visually disabled persons from most parts of the country attended these two institutions it may not fully represent the visually disabled population of Sri Lanka. The study could have been strengthened further by including a control group of people with normal vision so as to highlight the difficulties and challenges specific to the visually disabled further.

Recommendations (way forward)

We make the following recommendations to help the visually disabled consumers overcome challenges they face during use of medicines. These would be elaborated under the subcategories of:

1. Further studies
2. Pharmacy professional practice
3. Health service system
4. Educate and develop skills of visually disabled persons and their caregivers.

Further studies

Further studies should be undertaken to explore these issues in depth and to develop and validate methods to overcome the identified key difficulties in medicine use by visually disabled consumers.

Pharmacy professional practice

At the practice level, knowledge, skills and attitudes of health professionals such as doctors, pharmacists and nurses should be developed by scientific communication and publication of relevant studies. They should be specially trained on how to communicate medicine-related information and instructions in suitable ways to visually disabled patients.\(^9\)

Strategies should be developed to overcome difficulties faced during self-administration of medicines. Special medicine containers that provide instructions via tactile inputs, Braille labelling of medicine containers, and colour coding of medicines for partially sighted...
persons are some strategies that can be developed.10

Commonly required medicine information should be made available in Braille and audio formats. General and specific information and instructions regarding medicine use as well as methods of overcoming challenges to medicine use posed by visual disability should be provided to the visually disabled using these.

**Health service system**

At policy/governance level the policy makers should be made aware of this relatively undiscovered and neglected issue and motivated to identify it as an area that needs further exploration, policy planning, and incorporation into strategic frameworks for future activities. This would facilitate governmental financing for relevant training of health care professionals, purchasing of necessary equipment, generation of information in suitable ways (audio and Braille media) and conducting studies to fill gaps and voids in the necessary evidence base.

**Education and skills development of visually disabled persons and their caregivers**

Developing medicine-use-related skills in visually disabled persons medicine-related awareness programmes should be included in the teaching activities at schools for the visually disabled. Simple measures to overcome some difficulties identified should be taught such as keeping the radio on to keep track of time to administer medicines and keeping tablets to be divided on a plate with raised edge to avoid losing the pieces. The teaching programmes should also include techniques of minimizing medicine-related mishaps. Special educational programmes targeting the caregivers of visually disabled consumers should be planned to educate and create the necessary attitude in them to empower and motivate their visually disabled relatives to use medicine independently and safely.

**Acknowledgement**

We acknowledge the Electives programme of the Faculty of Medicine, University of Colombo, the Principal and staff of the School for the Visually Disabled, Ratmalana, Sri Lanka, and the Director and staff of the Seeduwa Vocational Training Institute, Sri Lanka and the participants for facilitating this study.

**References**


Challenges faced by visually disabled people in use of medicines, self-adopted coping strategies and medicine-related mishaps

Chamari L Weeraratne et al.


Annexure 1

Questionnaire

1. Following questions are about sociodemographic characteristics and personal information

1.1 Age: .................................................................................................................................

1.2 Gender:  □ Male  □ Female

1.3 Ethnicity:  □ Sinhala  □ Tamil  □ Muslim  Other: ......................

1.4 Religion:  □ Buddhism  □ Hindu  □ Islam  □ Catholic/ Christianity

1.5 What is the highest level of education you have achieved?
□ No schooling  □ Grade 1- 5  □ Grade 6 – 9  □ Up to O/L
□ Up to A/L  □ University Education  Other (specify): .................................

1.6 Occupation (if any): ........................................................................................................

1.7 Occupation of caregiver/s: ..............................................................................................

1.8 What is the extent of your visual impairment?
□ Some sight  □ No sight

1.9 When did you become visually impaired?
□ From birth  □ Later on  If later on, at what age? ..............................................

1.10 Are your caregivers (e.g. – parents) visually impaired?
□ Yes  □ No  If yes, who is affected? .................................................................

2. The following questions will be regarding your attitudes regarding medicine use

2.1 Please answer the following statements, according to the scale given below.

1. Strongly agree
2. Agree
3. Somewhat agree
4. Disagree
5. Strongly disagree
2.2 I like to gain knowledge regarding using medicines safely and effectively
1 2 3 4 5

2.3 I want to develop/improve on the skills of self-administering medicines
1 2 3 4 5

2.4 I think that I will always need the help of others to administer drugs
1 2 3 4 5

3. The following questions are regarding your possible health problems and medicine use

3.1 Have you had acute illnesses for which medicines were given?
☐ Yes ☐ No
If yes, please specify the illnesses you had: .................................................................
If yes, were you able to self-administer the medicine given? ☐ Yes ☐ No

3.2 Do you have any longstanding health problems (e.g. – asthma, DM,)?
☐ Yes ☐ No
If yes, please specify: .................................................................

3.3 Are you on any long-term treatment? ☐ Yes ☐ No
If yes, do you know the names of the medicines and how to take them?
☐ Yes ☐ No

4. If you are on any long-term treatment, can you self-administer the medicines you take without any support from others?
☐ Yes ☐ No

5. If yes, have you ever faced the following difficulties during medicine use?

1. I couldn’t locate where the drugs were kept
2. I couldn’t identify the separate drug containers
3. I have taken the wrong medicine
4. I didn’t know the correct dose
5. I had taken the wrong dose
6. I couldn’t see the clock to decide on the time
7. I missed a dose/doses
8. I spilled my medicine
9. I couldn’t complete the full course of treatment
10. I found it difficult to use liquid medicines
11. Any other difficulties: 

6. **Explain the difficulties you have faced in self-administration of medicines**

7. **Explain any methods you use to overcome the difficulties you mentioned above.**

8. **Have you had any mishaps when using medicines on your own?**
   - Yes
   - No
   If yes, please explain.

9. **Do you obtain your caregivers’ support to administer medicines?**
   - Yes
   - No
   If yes, what are the difficulties you face during medicine administration by your caretaker?