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Experiences of People with Visual Impairment regarding Multiple Medicine Usage at Public Health Institutions: An Empirical Qualitative Study

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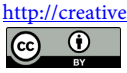

Abstract

Background: Individuals with visual impairment experience multiple health challenges alongside age-related and chronic conditions, leading to frequent and complex medication use. Managing several medicines is error-prone, and visual impairment further increases the risk of mistakes that compromise patient safety. **Purpose:** This study explored and described the experiences of people with visual impairment who use more than two medicines. **Method:** A qualitative exploratory descriptive design was employed to examine the lived experiences of visually impaired individuals. Participants were recruited through purposive sampling. Data were collected through individual face-to-face interviews and were analyzed thematically. **Results:** Three themes emerged: 1) challenges in self-administration of medication, 2) limited access to and management of medication information, and 3) difficulties with proper storage and disposal. Participants reported a loss of independence and privacy, anxiety about medication errors, and a lack of accessible guidance. **Conclusion:** Managing multiple medicines is a demanding and often stressful experience for people with visual impairment, affecting their autonomy and medication safety. These findings highlight the need for structured support systems that provide accessible medication information and reinforce safe self-management practices. Public health authorities should consider targeted education programs and community-based assistance for visually impaired individuals. Moreover, collaboration with pharmaceutical companies to design inclusive packaging with tactile cues, Braille labeling, and audio instructions could significantly improve medication safety and adherence within this population.

Keywords

Experiences, Multiple Medicines, Visual Impairment

1. Background

Visual impairment (VI) is a term used to describe both low vision and blindness. According to WHO, low vision is defined as visual acuity (VA) of less than 6/18 but equal to or better than 3/60, whereas blindness refers to a VA of less than 3/60 or a corresponding visual field loss of under 10 degrees in the better eye [1]. A VA below 6/18 indicates that an individual cannot see at six meters what a person with normal sight can see at eighteen meters, while a VA of 3/60 means the individual cannot see at three meters what a person with normal sight can see at sixty meters [1]. The visual acuity test, conducted with a Snellen chart, assesses how well an individual can discern details from a specific distance. Therefore, a person with a VA of 3/60 in the better eye is regarded as having a visual impairment.

VI substantially affects activities of daily living, creating a significant burden on both individuals and society. Adhering to medication regimens is a major challenge among people with VI, often resulting in poor disease management [2]. According to Easley, Kuber, and Ozok, proper medication management is essential to ensure the safe and effective use of medicines [3]. For individuals prescribed multiple medications, adherence to complex regimens can be particularly demanding.

Medication use is inherently complex and error-prone, with mistakes that can endanger patient safety occurring in both hospital and home settings [4]. Regardless of age or physical ability, medicines should be reliable and practical to use. However, individuals with VI who use multiple medicines are more susceptible to medication-use errors. Common challenges include difficulty distinguishing between medicine containers or packaging, confirming the correct medication, and reading refill instructions [4]. The inability to read medication labels forces visually impaired individuals to rely heavily on memory [5], emphasizing the need to consider their cognitive load during prescribing, dispensing, and refilling processes.

According to the WHO [6], more than 80% of all vision loss cases globally can be prevented or cured. In response to the global magnitude of VI and its projected increase, the International Agency for the Prevention of Blindness launched the "Vision 2020: The Right to Sight" initiative, which aimed to eliminate avoidable blindness worldwide [7].

A study conducted in South Africa revealed that the burden of VI is not evenly distributed globally, with less developed regions carrying the greatest share [8]. In Namibia, the 2016 Namibia Intercensal Demographic Survey found that VI was ranked as the second most common disability after physical disability [9]. The Windhoek Central Hospital Eye Clinic recorded 58 VI cases between June and

October 2017 [10].

Many individuals with VI also experience co-morbidities conditions such as diabetes mellitus and hypertension, requiring the use of multiple medications. However, there are currently no audible medication containers, Braille labeling, or tactile instructions to support independent medication use. A study conducted at the University of Anna in India proposed a technical solution to assist visually impaired individuals in reading printed information in real time. The study recommended using assistive devices that employ camera modules to capture product images, convert these images into text, and subsequently generate voice output through earphones [11]. The authors also emphasized the value of Braille or tactile medicine information, raised dots that can be read by touch by individuals who are blind or have low vision. Since 2005, Braille labeling has been mandatory for all pharmaceutical products in Europe, while in the United States, its use remains voluntary, though guidance encourages inclusion across the industry [12].

Despite global initiatives such as *Vision* 2020, there remains limited evidence on how people with visual impairment manage multiple medications in low- and middle-income settings, particularly in Namibia. Existing research has largely focused on the prevalence and causes of visual impairment, with less attention to the everyday experiences of medication management among this population. This study therefore contributes to the existing body of knowledge by providing new insights into the lived experiences, challenges, and unmet support needs of people with visual impairment in medication use. The findings aim to inform policymakers, healthcare providers, and the pharmaceutical industry in developing accessible medication systems and inclusive health strategies tailored to this population.

Because visually impaired individuals often depend on memory to identify and manage their medications, they are at increased risk of errors. Therefore, this study was conducted to explore the experiences of people with VI in using multiple medications, with the aim of identifying their challenges and suggesting strategies to address them.

2. Materials and Methods

2.1. Study Aim

The aim of this study was to explore and describe the experiences of people with visual impairment who use more than two medications.

2.2. Study Design

A qualitative exploratory descriptive design was employed to gain an in-depth understanding of the lived experiences of visually impaired individuals in managing multiple medications.

2.3. Study Setting and Population

The study was conducted at the eye clinic of Windhoek Central Hospital, located

in the Khomas Region of Namibia. The population comprised 58 newly diagnosed visually impaired individuals who were diagnosed, admitted, and followed up at the eye clinic and eye ward. Eligible participants were aged 18 years and above and had used two or more medicines within the preceding six months.

2.4. Sampling and Recruitment

A nonprobability purposive sampling approach was used to identify participants who could provide rich information about the phenomenon under study *i.e.*, participants who were visually impaired, had comorbidity and used more than two medicines within the six preceding months. To ensure inclusion criteria, the researcher went through admission register and purposively selected patients who were visually impaired and were on more than two medications, probably due to comorbidity. Prior to data collection the researcher verified the inclusion criteria with the participants and their caretakers (care takers who were available). This was done to make sure that the researcher recruited patients who could share the lived experiences about the phenomenon. Data saturation was reached after seven participants had been interviewed. All participants met the inclusion criteria and consented voluntarily to take part in the study.

2.5. Data Collection

Data were collected through in-depth, face-to-face interviews guided by a semi-structured schedule. The interview guide was developed and piloted with three visually impaired individuals from a local private hospital; no major revisions were required following the pilot. Questions were aligned with the study aim and informed by both the literature and the researcher's professional experience as a registered nurse and assistant ophthalmologist with more than ten years of practice.

Before each interview, the researcher provided a clear verbal explanation of the study's purpose, procedures, risks, and benefits. Information was delivered in simple, non-technical language, and participants were given time to reflect and ask questions. For participants who were totally blind and accompanied by a caregiver, written consent was obtained from the caregiver, while the researcher ensured that the participant personally understood the information and gave verbal assent.

Interviews were conducted at the Windhoek Central Hospital eye clinic between June and July 2018. Each session lasted approximately 45 - 60 minutes and was audio-recorded with participants' permission.

2.6. Data Analysis

Data were analyzed thematically using an interpretive qualitative approach to capture participants' meanings, perceptions, and experiences. Recorded interviews were transcribed immediately after data collection, and transcripts were read repeatedly to ensure deep familiarity with the content. From these transcripts, mean-

ingful clusters of data (units of meaning) were identified, reduced into initial codes, and then organized into themes and sub-themes. Themes were refined through iterative re-reading, comparison across participants, and repeated adjustments until coherent categories emerged that accurately reflected participants' perspectives. Final codes were applied to facilitate retrieval and organization of data relevant to each theme, and connections between themes and sub-themes were established to produce the final synthesis.

All coding and theme development were conducted by the researcher who collected the data. To strengthen analytic rigor, the researcher attended institutional qualitative data analysis lectures prior to and during the analysis. This iterative, interpretive process ensured that the final themes provided a faithful representation of participants' experiences.

2.7. Trustworthiness

Trustworthiness of the study was ensured using the criteria proposed by Lincoln and Guba (1985): credibility, dependability, confirmability, and transferability. Credibility was established through prolonged engagement in the field over two months and verification of instruments and results by the academic supervisor. Dependability and was achieved through an audit trail and an extensive literature review. Confirmability was enhanced by maintaining a clear chain of analytic actions from transcripts to data clusters, codes, themes, and sub-themes, allowing external tracing of decisions. Transferability was enhanced by providing rich, detailed descriptions of participants, settings, and research processes, enabling readers to assess the applicability of the findings to other contexts.

3. Ethical Considerations

Ethical approval was obtained from the University of Namibia Research Ethics Committee, and permission was granted by the Ministry of Health and Social Services. The study adhered to the ethical principles of the *Declaration of Helsinki* (World Medical Association [WMA], 2013).

Informed Consent: Written informed consent was obtained from all participants prior to data collection, in the presence of their caregivers and the researcher. All participants were provided with detailed study information, including the objectives, procedures, potential risks, and benefits.

Confidentiality: To ensure confidentiality, all study data were stored securely in a locked cabinet at the researcher's office. Identifiers were replaced with pseudonyms, and data were handled with strict adherence to anonymity. The principles of respect for persons, beneficence, and justice were observed throughout the research process.

4. Results

The qualitative data focused on the demographic profiles of the participants as well as the themes and subthemes that were generated from the collected data.

4.1. Demographic Profile

Data saturation was reached with seven participants, who were identified as participants with visual impairment (PVI): PVI 1-7. There were four male and three female participants, with an age range of between 20 and 62.

Two of the seven study participants met the criterion of being identified as having blindness, whereas five participants had a visual acuity of less than 6/18 but equal to or better than 3/60 (see Table 1).

Table 1. Demographic characteristics of participants (n = 7).

Participant ID	Sex	Age (years)	Degree of Visual Impairment	Number of Medications Used
PVI 1	Male	20	Low vision	2
PVI 2	Female	27	Low vision	3
PVI 3	Male	33	Blindness	2
PVI 4	Female	41	Low vision	4
PVI 5	Male	55	Blindness	5
PVI 6	Male	59	Low vision	2
PVI 7	Female	62	Low vision	3

4.2. Themes and Subthemes

Analysis of the interview data generated three major themes and six subthemes, capturing the key variations in participants' experiences and perceptions. The subthemes are presented within their corresponding main themes, with representative verbatim quotations included to illustrate areas of both commonality and divergence among participants' accounts (see Table 2).

Table 2. Themes, subthemes, and illustrative participant quotations (n = 7).

Theme	Subtheme	Illustrative quotation*
1. Difficulties in Self-Administration of Medications	Inability to differentiate between medications	"The eye medicine bottles all look the same, and it's hard to tell which one to use. Tablets are easier only when they differ in shape." (PVI4)
	Dependence on others and missed doses	"Most of the time, my wife or kids help me. When no one is around, I don't use the medicines, especially the eye drops." (PVI7)
2. Experiences with Medication Information Management	Limited knowledge and use of medication lists	"What is the medicine list? I don't have one. All my medicines are just written in the hospital book." (PVI3)
	Poor communication with healthcare providers	"The nurses are always busy. They don't have time to discuss problems, and doctors only check if medicines are enough." (PVI5)
3. Difficulties in the Proper Storage and Disposal of Medicines	Improvised and unsafe storage practices	"I keep the medicine in the bathroom so I remember to take it in the morning; if it's under the pillow, it's for night use." (PVI3)
	Inappropriate disposal of leftover medicines	"I throw old medicines in the dustbin or flush them down the toilet. The nurses never told me what to do with leftovers." (PVI5)

Note. Quotations are minimally edited for clarity while preserving participants' original meaning.

4.2.1. Theme 1: Difficulties in Self-Administration of Medications

Participants described substantial challenges in independently managing their medicines due to reduced visual acuity. The inability to differentiate between medications, especially pills, tablets, and capsules of similar size or packaging, was the most frequently cited problem and often resulted in dosing errors or skipped medication. This difficulty was compounded by comorbidities such as diabetes and hypertension, which required multiple concurrent prescriptions.

Some participants noted that brighter colors enhanced recognition, whereas dark packaging impeded identification.

> "Eye medicine bottles look the same, and I can't tell them apart by touch. Tablets are easier only when their shapes differ." (PVI4)
> "If the papers or labels were in bright colors like red or yellow, it would be easier to know which medicine is for sugar or for pain." (PVI3)

Beyond labeling, dependence on others emerged as a consistent subtheme. Many participants relied on family members for instruction and administration, which elicited frustration and a perceived loss of independence:

> "Most of the time, my wife or kids must help me. When no one is around, I don't use the medicines, especially the eye drops." (PVI7)

Forgetfulness and uncertainty about dosage also interfered with adherence. Participants described missing or mistiming doses due to memory lapses and a lack of accessible reminders:

> "I missed my medicines many times because it is difficult to remember how I should take them." (PVI1)

Finally, the physical design of medication packaging posed additional barriers. Difficulties opening blister packs or small containers increased frustration and the risk of damage:

> "The problem is with plastics for tablets; I can't see where to pull them apart, so I tear them. My wife now puts tablets in bottles so I can open them." (PVI4)

Altogether, these findings emphasize the compounded risk of medication error and reduced treatment adherence among visually impaired patients managing multiple prescriptions.

4.2.2. Theme 2: Experiences with Medication Information Management

Participants reported varied and often limited experiences regarding the management of medication information. A prominent issue was the lack of awareness and understanding of medication lists. Several participants indicated that they were either unfamiliar with such lists or unsure of their purpose, while others mentioned that healthcare providers did not emphasize their use. Those who had medication lists expressed reluctance or confusion about how to use them.

"What is the medicine list? I don't have it. All my medicines are written in the hospital book, which is in the room." (PVI3)
"I was not given any list of medicines. They are written in the passport, but I don't know the names of some of them." (PVI1)

These testimonies suggest that the role of medication lists as a communication and safety tool is poorly understood among visually impaired individuals, largely due to inadequate explanation or reinforcement by healthcare professionals.

Another key subtheme was ineffective communication between patients and healthcare providers. Participants consistently reported that nurses and doctors appeared too busy to discuss their medications in detail. This limited interaction reduced opportunities to clarify instructions and address concerns, thereby increasing dependence on memory and speculation.

"No, the nurses are always busy. They don't have time to discuss problems. Doctors only check if medicines are enough—they never ask about difficulties in using them." (PVI5)
"When you ask, the person answers while walking away." (PVI3)

Some participants expressed resignation about raising concerns, feeling that communication would yield little support.

"I don't want to bother people when I know there's nothing they will do even if I tell them about the challenges." (PVI1)

Overall, these findings highlight gaps in patient-provider communication and the absence of accessible medication information systems for individuals with visual impairment. Strengthening communication practices, reinforcing the use of medication lists, and integrating accessible information delivery methods are essential to improve medication safety and adherence in this population.

4.2.3. Theme 3: Difficulties in the Proper Storage and Disposal of Medicines

Participants described significant challenges in determining safe and appropriate ways to store and dispose of their medicines. Most participants reported that they had no designated storage space and instead kept medicines in locations they personally associated with dosing times or convenience. Common storage sites included bags, clothing pockets, kitchen cupboards, refrigerators, bathrooms, or under pillows. While such strategies were intended to support adherence, they often exposed medicines to unsuitable conditions and heightened the risk of confusion or degradation.

"I keep the medicine in the bathroom so I remember to take it in the morning when I bathe. If it's under the pillow, it means it's for night use when I sleep." (PVI3)
"I always put my medicines in different pockets of my clothes, especially when I travel, so that I don't get confused." (PVI1)

Some participants seemed unaware of the need to keep medicines out of reach of children or vulnerable individuals, or to protect them from humidity and heat. Others acknowledged that this lack of awareness frequently led to the unintentional mixing or misplacement of medicines.

> "I put medicines in the shower or cupboard. When I keep them under the pillow, they sometimes fall or get mixed up." (PVI4)
> "Sometimes I put them in the kitchen cupboard or near my bed—it's easier to find them, but then I also confuse one with another." (PVI6)

The disposal of leftover or expired medicines presented another area of concern. None of the participants reported receiving guidance from healthcare providers on safe disposal practices. Instead, they discarded unused drugs in household waste bins, outdoor ditches, or flushed them down toilets or sinks. These practices not only pose environmental risks but also reflect systemic gaps in patient education.

> "I throw old medicines in the dustbin outside the house; if the container is empty, I throw it in the bin inside." (PVI5)
> "Sometimes I flush tablets down the toilet. The nurses never told me what to do with leftover medicines." (PVI7)

Overall, these findings reveal limited knowledge and support regarding safe medication storage and disposal among individuals with visual impairment. The absence of tailored guidance from healthcare providers increases the likelihood of unsafe practices, medication wastage, and potential harm to both patients and the environment.

5. Discussion

This study explored the experiences of people with visual impairment (VI) who use multiple medications, offering insight into the intersection between disability, medication safety, and public health. Three themes emerged: difficulties in self-administration, challenges in medication information management, and problems with proper storage and disposal that collectively illustrate how visual impairment amplifies the risks associated with polypharmacy.

5.1. Difficulties in Self-Administration of Medications

Self-administration of medicines (SAMs) aims to promote independence and understanding of treatment regimens, with healthcare professionals acting as supervisors and educators. However, implementing SAMs among people with VI remains difficult and often requires prolonged supervision or hospitalization. Participants in this study could not easily differentiate between types of medications, especially when alone at home, leading to reliance on family members and missed doses. These results align with findings by Garfield *et al.*, who noted that patients with inconsistent capacity were often restricted from self-medication due to safety

concerns [13]. Many participants in this study also reported comorbidities such as hypertension and diabetes, requiring multiple medicines, a pattern consistent with evidence showing that increased medication burden elevates the likelihood of complications and adverse outcomes [13]. Previous studies have confirmed similar difficulties among visually impaired patients struggling to distinguish medications by name, appearance, or packaging [13]. The inability to administer medicines correctly constitutes a potential medication error that may cause treatment failure or harm.

Participants also experienced difficulty opening medicine containers or blister packs, echoing Philbert, Notenboom, Bouvy, and Van Geffen [14] [15], who found that patients frequently struggled with packaging design. These findings emphasize the role of clear labeling, tactile identifiers, and accessible packaging instructions in minimizing errors.

5.2. Experiences with Medication Information Management

A consistent theme across interviews was the lack of awareness and use of medication lists. Most participants were either unaware of the medication lists included in their medical booklets or did not understand their purpose. This reflects a broader issue of medication list discrepancies, which are known to contribute to prescribing errors and mistakes in self-administration [16]. Reconciliation of medication records during transitions of care is therefore essential to reduce the risks of polypharmacy, prevent adverse effects, and avoid unnecessary healthcare costs.

Recent literature further emphasizes that accessible medication information for people with visual impairment remains a critical gap in healthcare delivery. Despite longstanding recognition of this problem, most medication guides and labeling systems continue to be designed primarily for sighted users. As a result, visually impaired patients face heightened risks of medication errors, poor adherence, and reduced autonomy [17]. To address these challenges, researchers have begun to evaluate practical solutions, including accessible written guides in large print, audio, and digital formats, as well as the integration of Braille prescription labels in pharmacy practice. Nguyen highlights systemic barriers, noting that patients with visual impairment frequently report difficulty obtaining accessible written medication information, even in contexts where regulatory frameworks mandate its availability [18].

5.3. Difficulties in the Medication Storage and Disposal

Safe medicine storage and disposal are integral to rational medicine use (19). Participants reported storing medicines in diverse locations, including bags, cupboards, fridges, bathrooms, and under pillows, to avoid confusion and to serve as reminders. However, such practices expose medicines to moisture, light, and temperature fluctuations that compromise their stability. Similar concerns have been raised in other studies, which indicate that storage in warm, humid areas such as bathrooms accelerates drug degradation [19]-[22].

None of the participants reported returning unused medicines to hospitals or pharmacies. Instead, they commonly disposed of leftovers by discarding them in household waste, burying them outside, or flushing them down toilets or sinks. These behaviors are consistent with findings from Malaysia, Saudi Arabia, and other countries, where unused medicines are often stored for future use or inappropriately discarded, posing risks of environmental contamination [23]-[25]. These results underscore the need for public health education on proper storage and disposal methods, tailored to the needs of people with VI.

6. Contribution to Knowledge

This study expands the limited body of evidence concerning the everyday medication use experiences of visually impaired individuals in sub-Saharan Africa. Consistent with global research, the findings demonstrate that inadequate labeling, poor communication, and unsafe medication handling practices compromise adherence and safety. By illuminating these challenges in the Namibian context, the study provides a foundation for developing inclusive medication management strategies, assistive labeling innovations, and health education interventions that promote medication safety and independence among people with VI.

7. Conclusion and Recommendations

This study highlights the complex challenges encountered by people with visual impairment (VI) in safely managing multiple medicines. Difficulties in distinguishing medication types, limited access to readable or tactile instructions, poor communication with healthcare providers, and unsafe storage or disposal practices contribute to reduced adherence and increased medication error risk. These findings emphasize that medication management for visually impaired individuals extends beyond clinical treatment; it represents a broader patient safety and equity issue within public health.

Given these challenges, health authorities should:

1) Develop structured medication management support programs for visually impaired individuals, including home-based or community counseling by pharmacists and nurses.

2) Promote inclusive labeling standards, encouraging pharmaceutical companies to integrate Braille labeling, tactile symbols, or audio-enabled packaging to enhance accessibility.

3) Reinforce patient-provider communication training for healthcare professionals to ensure sufficient time and skills are allocated to medication education for patients with disabilities.

4) Implement public health education initiatives addressing safe household storage and proper disposal of unused or expired medicines. Encourage interdisciplinary collaboration between ophthalmic services, pharmacists, and assistive technology sectors to design interventions that maintain patient autonomy while reducing medication errors.

By integrating these measures, health systems can improve medication safety, reduce preventable harm, and foster independence and dignity among people living with visual impairment.

8. Study Limitations

This study was qualitative and conducted in a single hospital setting with a small sample of seven participants; therefore, the findings may not be generalizable to all individuals with visual impairment or across different healthcare settings. Responses were self-reported and may have been influenced by social desirability or recall bias. Additionally, data were collected in 2018; changes in service provision or public health policy since then may not be reflected. However, the study provides rich, contextualized insights that deepen understanding of the ways visual impairment influences medication use behavior and points to areas requiring further quantitative and intervention research.

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Data Availability Statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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