

## UTILITY OF MEDICINES INFORMATION LEAFLETS IN HYPERTENSIVE CARE IN A SETTING WITH LOW HEALTH LITERACY: A CROSS-SECTIONAL STUDY

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### ABSTRACT

**Introduction:** Higher levels of health literacy improve utilization of health information, medication adherence and outcomes. Few studies evaluate the utility of medicines information in hypertensive care in settings with low health literacy.

**Aim:** To determine the level of health literacy and utility of medicines information leaflets (MIL) among hypertensive patients in public health care in Namibia.

**Methods:** A hospital-based survey among hypertensive patients receiving care at a referral hospital in Namibia from the 8<sup>th</sup> to 29<sup>th</sup> June 2018. Patient's health literacy and utility of MIL were assessed using three literacy tools and a survey questionnaire. Quantitative data were analysed using descriptive statistics and qualitative thematic content analysis for factors associate with the utility of the MIL.

**Results:** Of the 139 patients, 63% were female and the mean age was 45.7(range: 19.0-84.0) years. Over 85.6% had of low literacy skills (REALM score<44, i.e. unable to read simple health materials), 38.8% had positive SILS scores ( $\geq 2$ , require help to read medicines information) and 66.9% had inadequate skills for comprehension, appraisal and decision-making with regard to health information (HLSI-SF score <70%). The level of access to and utility of MIL were low, 32.4% and 34.6% respectively. The main

factors associated with poor utility of the MIL were low patient health literacy, lack of guidelines on the use of MIL and MIL written in non-native languages.

**Conclusion:** Low rates of health literacy and utility of MIL were observed among hypertensive patients in Namibia. The integration of health literacy programmes, and MIL guidelines are needed to promote utility of medicine information and improve medication adherence.

**KEY WORDS:** Access, Health Literacy, Medicine information leaflets, Namibia, Utility

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## INTRODUCTION

Inadequate literacy is a major barrier to access to public health care, particularly among patients in sub-Saharan Africa (Amoah & Phillips, 2018; Kickbusch, 2001; Smith-Greenaway, 2015). Current evidence suggest that limited literacy negatively impacts on a wide array of health outcomes, including childhood health, mental health and in patients with chronic diseases (Kohler et al., 2015; LeVine, LeVine, Schnell-Anzola, Rowe, & Dexter, 2012; McTavish, Moore, Harper, & Lynch, 2010). However, there is limited data on the impact of health literacy on the utility of medicine information among hypertensive patients in the sub-Saharan Africa where the burden of the disease is highest (Irazola et al., 2016; Nashilongo et al., 2017a).

Over half (9.4 million) of deaths due to cardiovascular diseases (CVD) globally, are linked to hypertension, the majority of which are among patients in lower- and middle-income countries (LMICs) in the sub-Saharan Africa (Forouzanfar et al., 2017; Kearney et al., 2005). With an estimated prevalence of 45%, Namibia has one of the highest burden of hypertension in sub-Saharan Africa (Ataklte et al., 2015; Craig, Gage, & Thomas, 2018; Hendriks et al., 2012). This is a concern given the universal access to cost-free hypertensive care and medicines in Namibia. Nashilongo *et al.* estimated that 58% of hypertensive patients in the suburbs of Windhoek do not adhere to their medication (Nashilongo et al., 2017b). These findings concur with the World Health Organisation (WHO) estimates that over half of patients do not use their medication correctly (Halloway & Van Dijk, 2011; Massele et al., 2017). Moreover, adherence to

antihypertensive medication is critical in the prevention of cardiovascular complications (Vrijens, Antoniou, Burnier, de la Sierra, & Volpe, 2017).

Several studies identified low health literacy rates among hypertensive patients as a major risk factor for sub-optimal utility of medicine information, medication adherence and blood pressure control (Amoah & Phillips, 2018; Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Gazmararian et al., 2006; Hendriks et al., 2012). The WHO describes health literacy as the ability to engage with health information and services (Batterham et al., 2014; Husson, Mols, Fransen, Van De Poll-Franse, & Ezendam, 2015; World Health Organization, 2013). This requires patients to access, comprehend, critique and use health information and services to make health related decisions such as adhering to medicines prescribed (Batterham et al., 2014). A study across 14 sub-Saharan countries based on data from national demographic surveys estimated health literacy rates to range from 4% to 65.7%, with Namibia having the highest rate (McClintock, Schrauben, Andrews, & Wiebe, 2017; McTavish et al., 2010). This is helped by the fact that in 2015 the National Health Literacy Programme of Namibia estimated over 76% enrolment into adult literacy programs. However, a study by Likando *et al* challenges that adult literacy rarely translates into functional literacy to independently perform tasks such as improving medicine use based on the information contained in medicine leaflets (Likando G, Matengu K, 2016; Papen, 2005; SAIDE, n.d.). Sub-optimal utility of medicines information is a public health concern in patients with chronic non communicable diseases (NCDs) such as hypertension that require adequate levels of health literacy for medication adherence and self-care (Gazmararian et al., 2006; Larki, Tahmasebi, & Reisi, 2018; Lee, Yu, You, & Son, 2017).

The implementation of the United Nations Sustainable Development Goals (SDGs) in most countries in sub-Saharan Africa has enhanced access to universal health literacy programmes and the utility of medicines information (Sachs, 2012; World Health Organization, 2015)(Amoah & Phillips, 2018). In Namibia, the National Human Rights Action Plan, Namibia patient's charter, and the Medicines and Related Substance

Control Act provide a legal framework for patients to the right to access information on treatment and medicines information leaflets (MIL) (National Human Rights Action Plan, 2015; Pharmacy Council of Namibia, 2004; Republic of Namibia Ministry of Health and Social Services, 2016). In this legal framework, all patients who receive health care are entitled to obtain medicines information leaflets written in the official language that includes basic information on the medicine. For patients to effectively utilize MIL requires adequate level of health literacy , i.e. the ability to read and comprehend medicines information with limited support and make decisions regarding to their health (McNaughton, Jacobson, & Kripalani, 2014; Pander Maat & Lentz, 2010). Several studies give conflicting information on the utility of MIL in low and middle income countries (LMICs), some indicating low and others high utility (Colledge, Car, Donnelly, & Majeed, 2008; Cronin, O'Hanlon, & O'Connor, 2011; Mary Dixon-Woods, 2001; Pander Maat & Lentz, 2010).

Nevertheless, despite the relatively high adult literacy rates in Namibia, there is limited data on the health literacy levels (reading, comprehension and numeracy of health materials) and its impact on the utility of medicines information in public health care. Consequently, the study sought to address this by assessing the level of health literacy, access to, and utility of MIL, among hypertensive patients and professionals at public health facilities in Namibia. The findings can be used to guide future policies for equitable access to medicines information at the point of care among public health facilities across Namibia as well as across sub-Saharan Africa.

## **METHODS**

### *Study design and population*

The study consisted of two surveys, one among hypertensive patients and the other among health care professionals. The first survey assessed the levels of health literacy and utility of the MIL among hypertensive patients. This was conducted at Katutura Intermediate hospital, a tertiary referral hospital from 8<sup>th</sup> June to 29<sup>th</sup> June 2018 using patient exit interviews. The hospital has annual turnover of 7000 patients on medication for NCDs including anti-hypertensive medication. A sample of 185 patients was

estimated using Leslie Kish method (Kish, 2005; Sudman, 1967). The study included only patients on antihypertensive treatment with at least one medication for a period of 3 months or more and gave written consent to participate. The study excluded patients who did not consent to participate, too sick to participate and/or unable to communicate due to language barrier (**Figure 1**).

Secondly, a survey was conducted among healthcare professionals (HCPs), i.e. pharmacists, pharmacists-assistants and nurses, involved in dispensing anti-hypertensive medication, HCPs were interviewed using a semi-structured questionnaire to assess the factors associated with access to, and utility of, the MIL. The questionnaire assessed perceptions regarding the need, usefulness, availability, benefits and barriers to using the MIL.

#### *Data collection procedure*

Data on access to, and utility of, the MIL and associated factors were collected from hypertensive patients receiving care at the outpatient department of KIH. Patients were systematically (i.e. every third patient) recruited over the study period based on daily attendance registers. Patients were interviewed for access and utility of the MIL using a semi-structured questionnaire and health literacy using three tools. These were the, Single Item Literacy Screener (SILs), Health Literacy Skills instrument-Short Form (HLSI-SF) and Rapid Estimate of Literacy in Medicine (REALMs) tools (see below). The three health literacy tools were subsequently assessed for comprehension, reading skills and numeracy skills. All the tools were piloted among 10 patients receiving antihypertensive care at the Intermediate hospital between 22-24 May 2018 for suitability of the question items using semi-structured interviews. The face validity of the tools was subsequently established by the research team (SM, DK, EH) using 10 questionnaires for appropriateness of question items and standardized prior to the conducting interviews. Interviews to assess for health literacy and utility of the MIL were conducted in English. For some patients, the questionnaires on utility of the MIL were interpreted in Afrikaans and Oshiwambo, two widely spoken local languages in Namibia. Each interview lasted between 20-30 minutes per patient.

## **[Insert Figure 1]**

In addition, data were collected from the HCPs involved in the prescribing and dispensing of antihypertensive medication at the hospital. Data were collected using structured questionnaire interviewer administered interviews that assessed for factors associated with the MIL and to promote access and utility of the MIL in antihypertensive care at the hospital. The study only included HCPs involved in hypertensive care and were on duty during the study interview.

### *Health literacy assessment tools*

The level of health literacy among the hypertensive patients was assessed using three tools (REALM, SILS and HLSI-SF), which assess different dimensions of health literacy. The REALM assessed for the basic reading skills (literacy), the SILS assessed for the need for the support when reading health related materials and the HLSI-SF assesses for comprehension and health seeking behaviours. A combination of three tools was used because no single tool comprehensively assess all the dimensions of health literacy.

First, the Rapid Estimate of Literacy in Medicine (REALM) tool assess the patient's ability to read medicine information (Davis et al., 1993; Haun, 2012). The REALM tool consists of 66 health terms. The patient is scored with a point for the number of words that they read and pronounce with a maximum of 66 points. REALM scores 0-18 indicate that a patient is unable to read easy health information, 19-44 indicate that patients are only be able to read simple materials and a score above 44 indicates that the patient is able to read and understand health information. In this study, a REALM score of less than 44 was regarded as low literacy and unable to read or utilize information on the MIL.

Second, a Single Item Literacy Screener (SILS) tool was used to assess the patient's need for support in reading health related materials (Morris, MacLean, Chew, & Littenberg, 2006). Patients responded to a single question item "How often do you need to have someone help you when you read medicine information leaflets, or other written

material from your doctor or pharmacy?" The SILS is scored with 1 (never), 2 (rarely), 3 (sometimes), 4 (often) and 5 (always). Negative SILS score ( $\leq 2$ ) indicates that the patient never or rarely needs help when reading health related materials while a positive SILS score ( $>2$ ) indicates that a patient experiences difficulty in reading health related materials and requires support.

Third, a 10-item Health Literacy Skills instrument-Short Form (HLSI-SF) assesses patient's comprehension, numeracy, health information seeking, decision-making and navigation skills (Bann, McCormack, Berkman, & Squiers, 2012). The HLSI-SF assessment requires patients to read a pre-designed MIL (print-prose), listen and correctly respond to recorded voices. The HLSI-SF is designed to measure patient's ability to remember and understand information they read on the print-prose, and find health information they need on printed documents. The tool also measures the ability to proficiently interpret figures and doing simple calculations according to the quantitative aspects of the print-prose, to remember and understand the information they heard or explain the health issue to a healthcare professionals, ease to find the health information they needed and reason out concepts. Each correctly answered item on the HLSI-SF is scored one point and the incorrect zero. A percentage HLSI-SF score  $\geq 70\%$  is considered as an adequate level of health literacy  $> 80\%$  proficient, 70-80% basic and  $< 70\%$  below basic.

### *Data analysis*

The primary outcomes of the study were level of health literacy (reading, comprehension and numeracy) and utility of MIL among hypertensive patients. The secondary outcome was the factors associated with the utility of the MIL in hypertensive care. Quantitative data on health literacy, utility and access to MIL were entered in Epidata v3.1 software for management and exported to SPSS v23 software for descriptive analysis. The REALM assessment graded health literacy as adequate for a score of  $\geq 44$ , SILs  $\leq 2$ , i.e. no need for assistance to read the MIL and 70% for HLSI-SF for comprehension, numeracy and decision-making. The factors associated with the utility of MIL were analysed qualitatively using content thematic analysis using manual

colour coding to generate themes and subthemes. The level of access to MILs were estimated respectively by the proportion (%) of patients that “always” received a MIL for their antihypertensive medication as required by the Medicines and Substance Act of Namibia. “*Do you always receive the leaflets for your medication?*” The level of utility of MIL was determined by the proportion of patients (%) that self-reported that they have ever made reference to the MIL with regards to their antihypertensive medication. The HSLI-SF was assessed for construct validity in the Namibian population using factor analysis.

In addition, data from HCPs was qualitatively analysed using content analysis for themes on the factors associated with, and potential strategies, to improve access and utility of MIL in antihypertensive care at the health facility.

### *Ethics*

The study was approved by Research and Ethics Committees of the Ministry of Health and social services and Katutura Intermediate Hospital (MoHSS042018). All respondents gave a written informed consent and confidentiality of data was maintained through anonymizing of questionnaires by use of codes rather than patient identifiers and all questionnaires secured at the University of Namibia.

## **RESULTS**

### *Characteristics of study populations*

Of the 185 target sample, 139 hypertensive patients were recruited giving a response rate of 75.1% (n=139/185). The majority of the patients were female (61.2%) and were not formally employed (63.3%). The average age was 45.7 years (range: 19.0-84.0); the majority not married (58.3%) and attained at least primary level education (54.7%, i.e. grade 10). Of the 139 patients, 90.6% were on follow-up visits, 18% had diabetes mellitus and 5.8% HIV/AIDS (**Figure 2**). Of the 139 patients, the majority were prescribed hydrochlorothiazide/amiloride (74.8%, i.e. co-amiloride®) or amlodipine (49.6%) their hypertension. Low dose aspirin (14%) and metformin (14%) were the most prescribed co-medications (**Figure 3**).



Of the 14 HCPs recruited, 57.1% were females. The mean age and working experience of the HCPs was  $34.1 \pm 7.0$  (range: 25.0-52.0) and  $10.8 \pm 7.3$  (range: 2.0-30.0) years respectively.

## **[Insert Figures 2]**

### *Health literacy among hypertensive patients*

Of the 139 patients, 85.6% were unable to easily read medicine information (REALM score: 0-18) and 14.4% were only able to read simple materials (REALM score: 19-44) (**Table 1**). None of the patients were able to read complex health information such as MILS, i.e. none had a REALM score  $\geq 44$ ).

On the SILS assessment, 38.8% ( $n=54/139$ ) of the patients had positive scores ( $>2$ ), that is they have limited reading ability and they need support when reading medicine information. These patients experience difficulty in reading health related materials and would require support (**Table 1**).

On average, patients had a health literacy level on HLSI-SF assessment of  $58.5\% \pm 18.5\%$  (range: 16.7%-100%). In addition, 66.9% of the patients had inadequate health literacy (HLSI-SF score  $< 70\%$ , **Figure 4**). That is two thirds of patients had limited ability to comprehend, communicate and make decisions regarding medicine information. In particular, 46% of the patients remembered and understood information they had read on the print-prose, 27.3% found health information they needed on printed documents and 42.4% proficiently interpreted figures and had performed simple calculations according to the print documentation. In addition, 47.5% of the patients remembered and had understood the information they heard or explained a health issue to a healthcare professionals according to the oral domain and 25.2% easily found the health information they needed and reasoned out concepts according to the internet domain (**Table 1**).

## **[Insert Table 1]**

### *Access of MIL in hypertensive care*

Of the 139 patients, 32.4% (n=45) always receive a MIL for their antihypertensive medication at hospital (**Table 2**). The level of access of medicine information leaflets for the antihypertensive medications were higher with amlodipine (44.5%) and perindopril (36%) compared to other medications. None of the patients received medicine information leaflets for co-amiloride, the most used antihypertensive (**Figure 3**).

Over 80% of the patients were aware of the right to access the MIL but 74.1% had never requested for a leaflet. Most patients, 79.9% (n=111/139) never received information on how and where to access, and instructions on the use of the MIL (**Table 2**).

Most healthcare professionals (HCPs) had never received training on optimizing access to, and utility of, MIL (78.6%). Healthcare professionals were not aware of hospital-based policies/guideline to enhance the use of MILs (85.7%). However, 35.7% were aware of the national legal frameworks for the distribution of the MIL, 28.6% citing the Pharmacy Act. Of the 14 healthcare professionals, 28.6% (n=4), always dispensed antihypertensive medicines with an MIL. Most HCPs (64.3%) acknowledged the importance of MILs, i.e. the MIL provides patients with more information on the medicines prescribed (57.2%), make patients more knowledgeable and responsible (71.4%) and encourages patient involvement in treatment (28.6%) (**Table 3**).

### *Utility of MIL in hypertensive care*

Of the 139 patients, 34.5% (n=48) always refer to the MIL. Of the 28 patients who received information on the use of the MIL, 92.9% found it useful. Overall, most patients perceive the MIL as useful (94.2%, n=131/139), easy to read and understand (80.6%) and prefer to access the MIL from pharmacy professionals (89.2%) (**Table 2**). Patients who are unable to read and understand the information on the MIL typically requested assistance from a peer or a family member. *“Although I cannot read English, I give my daughter to read for me always when I get it”*. Most patients (67.6%) prefer using the

MIL to other sources of medicine information because it is easy to manage or keep (66.9%).

Patients identified the most useful information on the MIL as the indications for the medicine (27.5%), storage instructions (22.9%), description of the medicine prescribed (19.8%) and dosage instructions (18.3%). Most patients preferred to receive the MIL from outpatient pharmacies professionals (79.1%) compared to *doctors* (12.2%) or other healthcare professionals.

The main reason patients read the MIL was insufficient information on their medication from either the doctor or the pharmacist. *“They don’t give us enough information on the medicine even the disease, especially the doctors like now you are telling me these medicines are for blood pressure but the doctor didn’t tell me about it”*. *“The pharmacy tells us more information about the medicine than the doctors but when I read the MIL I get more information”*. *“The pharmacy people do not have time to really explain, they just say how to take the medicine”*. Moreover, 58.3% (n=81/139) stated that the information on the MIL sometimes conflicts with that given at the hospital, and this requires further consultation with a doctor or pharmacist.

**[Insert Figure 3]**

**[Insert Table 2]**

#### *Factors influencing the access and utility of MIL*

Most patients (60.4%) were not satisfied with the quality and amount of medicine information they received especially from physicians. Patients reported limited access to the MIL at the hospital pharmacy and proposed that *‘manufacturers provide many copies of the MIL for all medicines’* (52.5%), *‘pharmacy staff make a deliberate effort to give each patient a MIL’* (22.3%), *‘educate the patients’* (14.4%), and *‘make the MIL more understandable’* (11.5%) (**Table 3**).

### **[Insert Table 3]**

Some healthcare professionals (35.7%) disregarded the importance of giving MIL to patients citing, information overload causing confusion among patients (21.4%), the side effects listed in the MIL would instill fear among patients resulting in medicine discontinuation (14.3%) and they had already given patients enough information (14.3%). The healthcare professionals' concerns on the distribution of MIL to patients included; (i) the side effects of the medicines would prevent patients from taking their medicines (28.6%), (ii) lack of up-to-date and objective information on the MIL (21.4%), (iii) patient's inability to read and understand the MIL (14.3%), (iv) patients' ignorance on the MIL (14.3%), and (v) not enough copies of the MIL supplied by manufacturers (14.3%) (**Table 3**).

Strategies suggested by healthcare professionals to improve access to, and utility of the MIL, included: (i) manufacturers provide many copies of the MIL for bulk medicines (57.1%), (ii) development of a website/electronic platform where MILs for all medicines registered in Namibia can be accessed (35.7%), (iii) the Namibia Medicines Regulatory Council (NMRC) to ensure that all bulk medicines are supplied with copies of the MIL (35.7%), (v) the need for patient education on the MIL (14.3%) and (v) the MIL to be made more understandable (7.1%) (**Table 3**).

### **[Insert Figure 4]**

### **[Insert Table 3]**

## **DISCUSSION**

We believe this is the first study to assess the level of health literacy, and utility of medicine information leaflets, among hypertensive patients at a public referral hospital in Namibia. This is important since inadequate health literacy, access and the utility of MILs was seen among hypertensive patients in Namibia. The inability of hypertensive patients to access and utilize medicine information is a major public health concern

given the high public health burden of hypertension and non-adherence to anti-hypertensive medicines in Namibia (Irazola et al., 2016; Nashilongo et al., 2017a)

Our study found low health literacy rates among antihypertensive patients using the three different tools, REALM, SILS and HLSI-SF. Over 85% antihypertensive patients are unable to read simple health information (REALM: 0-18), 38.8% require support to read materials (SILS>2) and 66.9% have limited ability to comprehend and make decisions regarding health information (HLSI-SF<70%). This is a concern given that the utility of medicine information, adherence to hypertensive medication and blood pressure control require health literacy (Park, Song, Shin, Jeong, & Lee, 2018). Our findings concur with several studies in sub-Saharan Africa that found low and varying rates of health literacy among patients on chronic medication and its impact on medication adherence and blood pressure control (Brown & Bussell, 2011; Gazmararian et al., 2006; Lee et al., 2017; McClintock et al., 2017). Several studies advocate that hypertensive patients in low literacy settings require repeated oral instructions and materials with illustrations in addition to written materials to comprehend and optimally use the information on the MIL, and we will be addressing this in future activities in Namibia.

Secondly, the study found limited access to MIL at the hospital (32.4%). This is despite most patients being aware of their right to medicines information and the usefulness of MIL (**Table 1**). Moreover, access to MIL varied by the type antihypertensive medication. For example, none of the patients accessed MIL for hydrochlorothiazide/amiloride, the most prescribed anti-hypertensive. These findings are similar to another study which reported that very few patients receive MIL with their medications (Poplas-Susič, Kersnik, & Klemenc-Ketis, 2014; Young, Tordoff, Leitch, & Smith, 2018). Our study also found a low level of utility of the MIL among hypertensive patients in public health care (34.6%; **Table 1**), which is a concern given, as mentioned, the high prevalence of hypertension in Namibia (Nashilongo et al., 2017a). The findings are comparable to a study conducted in Belgium which showed that MIL were infrequently read, i.e. 1 out of every four patients (Vander Stichele, De Potter, Vyncke, & Bogaert, 1996). The study in

Belgium also reported that patients aged  $\geq 65$  years always read the MIL while others never read the MIL, women read the MIL more often than men and the most frequently read parts of the MIL were on dosage and side effects (Vander Stichele et al., 1996). Nevertheless, the majority of patients in our study acknowledge the importance of MIL in promoting medication adherence, health education, as a reference and complement limited or contradictory verbal information (i.e. appropriate use and storage) given at the hospital by various HCPs (**Table 3**). Our findings partly differ though from the study by Mottram and Reed that found that patients thought the section on storage conditions was of little importance (Mottram & Reed, 1997). In Namibia, patients argued that information on the storage conditions of medications was important because the weather varies widely throughout the year, which they believed may negatively impact on the efficacy of their medication. Encouragingly, several studies concur with our findings that access to appropriate, user-friendly medicine information that is easily read, empowers patients regarding self-management and the safe use of medication for their NCDs (Du et al., 2018; Miller, 2016; Pander Maat & Lentz, 2010; Pandit et al., 2009).

Lastly, the study also found that limited access to MIL in hypertensive care in Namibia was due to a number of logistical factors, i.e. limited copies of MIL from manufacturers for bulk supplies, programmatic factors, i.e. lack of guidelines/systems for the distribution of MIL at health facilities, and behavioural factors, i.e. healthcare professionals negative perception on MIL distribution to patients (**Table 3**). For instance, some healthcare professionals believed that some patients may interrupt antihypertensive treatment if they become aware of serious adverse effects associated with their medication (**Table 3**). Our findings concur with those of Dixon-Woods *et al.* who reported that the use of MIL is greatly influenced by perceptions of individual patients, healthcare professional's role, the value of the leaflets, the quality of leaflets and the presence of appropriate topics that necessitate the use of the MIL. Similarly, Mottram and Reed and Tong *et al.* agree that the inclusion of information on adverse effects in the MIL impacts negatively on the use of medications among some patients

(Mottram & Reed, 1997; Tong, Raynor, & Aslani, 2014). Similarly, the limited utility of MIL in this study was partly due to a low health literacy (28.1%) among the patients (**Table 1**), lack of awareness/education on the MIL, programmatic factors i.e. the pharmacy staff not making a deliberate effort to distribute the MIL and insufficient copies available, and beliefs, i.e. patients believing they had already received enough information from pharmacy staff and doctors (**Table 3**). This was also seen in another study which showed that some patients believed they had received adequate information about the medicines from the healthcare professionals and consequently did not read the MIL (M Dixon-Woods, 1998). Mottram and Reed reported that some HCWs deemed some patients as not suitable to receive medicine information leaflets, which is contrary to the right to this information (Mottram & Reed, 1997). Nonetheless, despite the inability to read the MIL, most patients in our study requested for universal access to MILs given that a family member or community peer would help read the MIL if needed particularly if written in common and understandable languages, i.e. Afrikaans or English (**Table 1**).

In conclusion, health literacy, access to and utility of medicine information among hypertensive care is currently suboptimal in Namibia. The main factors influencing access to, and utility of, patient information leaflets in hypertensive care in Namibia are firstly low health literacy levels, secondly non-availability of MIL at points of care, thirdly lack of guidelines at points of care and lastly negative beliefs among patients and healthcare professionals. There is need for targeted interventions to integrate health literacy programmes in hypertensive care at public health facilities to enhance responsible self-care practices and outcomes among hypertensive patients in Namibia. In addition, there is need for policies to guide the effective implementation of systems to enhance access and utility of medicine information at points of care in the public health care. We will be following this up in future studies.

### *Limitations and strengths*

The results of this study should be interpreted with limitations. First, this single-centre study adopted a cross-sectional design and the results may not be generalizable.

Secondly, the study used a small sample size of hypertensive patients and may have under/overestimated the level of access to and utility of the MIL. Nevertheless, this is the first study in sub-Saharan Africa to assess health literacy, access to and utility of MIL among both patients and healthcare professionals using three health literacy tools. The study also provided preliminary information on the factors influencing the utility of medicine information in hypertensive care. In addition, this is the first study to assess the role of health literacy on the utility of medicine information in a high hypertension burden country in sub-Saharan Africa. Consequently, we believe that the findings of this study provides preliminary evidence on the level of access and utility of MIL which can be used to guide future research to improve access to and utility of the MIL among hypertensive patients in public health settings in LMICs including sub-Saharan Africa as well as low-literacy settings.

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### **REFERENCES**

Amoah, P. A., & Phillips, D. R. (2018). Health literacy and health: rethinking the strategies for universal health coverage in Ghana. *Public Health*.  
<https://doi.org/10.1016/j.puhe.2018.03.002>

Ataklte, F., Erqou, S., Kaptoge, S., Taye, B., Echouffo-Tcheugui, J. B., & Kengne, A. P.



- (2015). Burden of undiagnosed hypertension in sub-saharan africa: A systematic review and meta-analysis. *Hypertension*.  
<https://doi.org/10.1161/HYPERTENSIONAHA.114.04394>
- Bann, C. M., McCormack, L. A., Berkman, N. D., & Squiers, L. B. (2012). The health literacy skills instrument: A 10-item short form. In *Journal of Health Communication*.  
<https://doi.org/10.1080/10810730.2012.718042>
- Batterham, R. W., Buchbinder, R., Beauchamp, A., Dodson, S., Elsworth, G. R., & Osborne, R. H. (2014). The OPTimising HEalth LIterAcy (Ophelia) process: Study protocol for using health literacy profiling and community engagement to create and implement health reform. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-14-694>
- Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine*. <https://doi.org/10.7326/0003-4819-155-2-201107190-00005>
- Brown, M. T., & Bussell, J. K. (2011). Medication adherence: WHO cares? *Mayo Clinic Proceedings*. <https://doi.org/10.4065/mcp.2010.0575>
- Colledge, A., Car, J., Donnelly, A., & Majeed, A. (2008). Health information for patients: Time to look beyond patient information leaflets. *Journal of the Royal Society of Medicine*. <https://doi.org/10.1258/jrsm.2008.080149>
- Craig, L. S., Gage, A. J., & Thomas, A. M. (2018). Prevalence and predictors of hypertension in Namibia: A national-level cross-sectional study. *PLoS ONE*.  
<https://doi.org/10.1371/journal.pone.0204344>
- Cronin, M., O'Hanlon, S., & O'Connor, M. (2011). Readability level of patient information leaflets for older people. *Irish Journal of Medical Science*.  
<https://doi.org/10.1007/s11845-010-0624-x>
- Davis, T. C., Long, S. W., Jackson, R. H., Mayeaux, E. J., George, R. B., Murphy, P. W., & Crouch, M. A. (1993). Rapid estimate of adult literacy in medicine: A shortened screening instrument. *Family Medicine*.

- Dixon-Woods, M. (1998). Dissemination of printed information for patients: A qualitative study of general practices. *Health Education Journal*, 57(1), 16–30.
- Dixon-Woods, Mary. (2001). Writing wrongs? An analysis of published discourses about the use of patient information leaflets. *Social Science and Medicine*.  
[https://doi.org/10.1016/S0277-9536\(00\)00247-1](https://doi.org/10.1016/S0277-9536(00)00247-1)
- Du, S., Zhou, Y., Fu, C., Wang, Y., Du, X., & Xie, R. (2018). Health literacy and health outcomes in hypertension: An integrative review. *International Journal of Nursing Sciences*. <https://doi.org/10.1016/j.ijnss.2018.06.001>
- Forouzanfar, M. H., Liu, P., Roth, G. A., Ng, M., Biryukov, S., Marczak, L., ... Murray, C. J. L. (2017). Global burden of hypertension and systolic blood pressure of at least 110 to 115mmHg, 1990-2015. *JAMA - Journal of the American Medical Association*. <https://doi.org/10.1001/jama.2016.19043>
- Gazmararian, J. A., Kripalani, S., Miller, M. J., Echt, K. V., Ren, J., & Rask, K. (2006). Factors associated with medication refill adherence in cardiovascular-related diseases: A focus on health literacy. *Journal of General Internal Medicine*.  
<https://doi.org/10.1111/j.1525-1497.2006.00591.x>
- Halloway, K., & Van Dijk, L. (2011). *The World Medicines Situation 2011: rational use of medicines*. World Health Organisation. <https://doi.org/10.1089/acm.2009.0657>
- Haun, J. (2012). How Do we measure health literacy.
- Hendriks, M. E., Wit, F. W. N. M., Roos, M. T. L., Brewster, L. M., Akande, T. M., de Beer, I. H., ... Schultsz, C. (2012). Hypertension in Sub-Saharan Africa: Cross-sectional surveys in four rural and urban communities. *PLoS ONE*.  
<https://doi.org/10.1371/journal.pone.0032638>
- Husson, O., Mols, F., Fransen, M. P., Van De Poll-Franse, L. V., & Ezendam, N. P. M. (2015). Low subjective health literacy is associated with adverse health behaviors and worse health-related quality of life among colorectal cancer survivors: Results from the profiles registry. *Psycho-Oncology*. <https://doi.org/10.1002/pon.3678>
- Irazola, V. E., Gutierrez, L., Bloomfield, G., Carrillo-Larco, R. M., Dorairaj, P., Gaziano,

- T., ... Rubinstein, A. (2016). Hypertension Prevalence, Awareness, Treatment, and Control in Selected LMIC Communities Results from the NHLBI/UHG Network of Centers of Excellence for Chronic Diseases. *Global Heart*.  
<https://doi.org/10.1016/j.gheart.2015.12.008>
- Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J. (2005). Global burden of hypertension: Analysis of worldwide data. *Lancet*.  
[https://doi.org/10.1016/S0140-6736\(05\)70151-3](https://doi.org/10.1016/S0140-6736(05)70151-3)
- Kickbusch, I. S. (2001). Health literacy: Addressing the health and education divide. *Health Promotion International*. <https://doi.org/10.1093/heapro/16.3.289>
- Kish, L. (2005). Analytical Uses of Sample Surveys. In *Statistical Design for Research*.  
<https://doi.org/10.1002/0471725196.ch2>
- Kohler, H. P., Watkins, S. C., Behrman, J. R., Anglewicz, P., Kohler, I. V., Thornton, R. L., ... Kalilani-Phiri, L. (2015). Cohort Profile: The Malawi Longitudinal Study of Families and Health (MLSFH). *International Journal of Epidemiology*.  
<https://doi.org/10.1093/ije/dyu049>
- Larki, A., Tahmasebi, R., & Reisi, M. (2018). Factors predicting self-care behaviors among low health literacy hypertensive patients based on health belief model in Bushehr District, South of Iran. *International Journal of Hypertension*.  
<https://doi.org/10.1155/2018/9752736>
- Lee, Y. M., Yu, H. Y., You, M. A., & Son, Y. J. (2017). Impact of health literacy on medication adherence in older people with chronic diseases. *Collegian*.  
<https://doi.org/10.1016/j.colegn.2015.08.003>
- LeVine, R. A., LeVine, S., Schnell-Anzola, B., Rowe, M. L., & Dexter, E. (2012). *Literacy and Mothering: How Women's Schooling Changes the Lives of the World's Children*. *Literacy and Mothering: How Women's Schooling Changes the Lives of the World's Children*. <https://doi.org/10.1093/acprof:oso/9780195309829.001.0001>
- Likando G, Matengu K, S. M. (2016). Perspectives on adult literacy and livelihood: A review with reference to the National Literacy Programme in Namibia (NLPN).

*Journal of Studies in Humanities and Social Sciences*, 5(1), 74–82.

Massele, A., Afriyie, D., Burger, J., Ezenduka, C., Fadare, J., Kalungia, A., ... Godman, B. (2017). VP25 African Countries Are Working Together To Enhance Medicine Use. *International Journal of Technology Assessment in Health Care*.

<https://doi.org/10.1017/s0266462317003154>

McClintock, H., Schrauben, S., Andrews, A., & Wiebe, D. (2017). Measurement of health literacy to advance global health research: a study based on Demographic and Health Surveys in 14 sub-Saharan countries. *The Lancet Global Health*.

[https://doi.org/10.1016/s2214-109x\(17\)30125-0](https://doi.org/10.1016/s2214-109x(17)30125-0)

McNaughton, C. D., Jacobson, T. A., & Kripalani, S. (2014). Low literacy is associated with uncontrolled blood pressure in primary care patients with hypertension and heart disease. *Patient Education and Counseling*.

<https://doi.org/10.1016/j.pec.2014.05.007>

McTavish, S., Moore, S., Harper, S., & Lynch, J. (2010). National female literacy, individual socio-economic status, and maternal health care use in sub-Saharan Africa. *Social Science and Medicine*.

<https://doi.org/10.1016/j.socscimed.2010.09.007>

Miller, T. A. (2016). Health literacy and adherence to medical treatment in chronic and acute illness: A meta-analysis. *Patient Education and Counseling*.

<https://doi.org/10.1016/j.pec.2016.01.020>

Morris, N. S., MacLean, C. D., Chew, L. D., & Littenberg, B. (2006). The Single Item Literacy Screener: Evaluation of a brief instrument to identify limited reading ability. *BMC Family Practice*. <https://doi.org/10.1186/1471-2296-7-21>

Mottram, D. R., & Reed, C. (1997). Comparative evaluation of patient information leaflets by pharmacists, doctors and the general public. *Journal of Clinical Pharmacy & Therapeutics*, 22(2), 127–134.

Nashilongo, M. M., Singu, B., Kalemeera, F., Mubita, M., Naikaku, E., Baker, A., ... Kibuule, D. (2017a). Assessing Adherence to Antihypertensive Therapy in Primary

- Health Care in Namibia: Findings and Implications. *Cardiovascular Drugs and Therapy*, 31(5–6). <https://doi.org/10.1007/s10557-017-6756-8>
- Nashilongo, M. M., Singu, B., Kalemeera, F., Mubita, M., Naikaku, E., Baker, A., ... Kibuule, D. (2017b). Assessing Adherence to Antihypertensive Therapy in Primary Health Care in Namibia: Findings and Implications. *Cardiovascular Drugs and Therapy*. <https://doi.org/10.1007/s10557-017-6756-8>
- National Human Rights Action Plan. (2015). National Human Rights Action Plan ( NHRAP ) Republic of Namibia, (February), 1–2.
- Pander Maat, H., & Lentz, L. (2010). Improving the usability of patient information leaflets. *Patient Education and Counseling*. <https://doi.org/10.1016/j.pec.2009.09.030>
- Pandit, A. U., Tang, J. W., Bailey, S. C., Davis, T. C., Bocchini, M. V., Persell, S. D., ... Wolf, M. S. (2009). Education, literacy, and health: Mediating effects on hypertension knowledge and control. *Patient Education and Counseling*. <https://doi.org/10.1016/j.pec.2009.04.006>
- Papen, U. (2005). Literacy and development: What works for whom? or, how relevant is the social practices view of literacy for literacy education in developing countries? *International Journal of Educational Development*. <https://doi.org/10.1016/j.ijedudev.2004.05.001>
- Park, N. H., Song, M. S., Shin, S. Y., Jeong, J. hye, & Lee, H. Y. (2018). The effects of medication adherence and health literacy on health-related quality of life in older people with hypertension. *International Journal of Older People Nursing*. <https://doi.org/10.1111/opn.12196>
- Pharmacy Council of Namibia. PHARMACY ACT, 2004 (2004). Windhoek: Government of the Republic of Namibia.
- Poplas-Susič, T., Kersnik, J., & Klemenc-Ketis, Z. (2014). Usefulness of the patient information leaflet (PIL) and information on medicines from professionals: A patients' view. a qualitative study. *Zdravniski Vestnik*.

- Republic of Namibia Ministry of Health and Social Services. PATIENT CHARTER (2016). Windhoek: Namibia Ministry of Health and Social Services.
- Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(12\)60685-0](https://doi.org/10.1016/S0140-6736(12)60685-0)
- SAIDE. (n.d.). *National Literacy Programme in Namibia (NLPN): Ministry of Basic Education and Culture*. Windhoek.
- Smith-Greenaway, E. (2015). Are literacy skills associated with young adults' health in Africa? Evidence from Malawi. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2014.07.036>
- Sudman, S. (1967). Survey Sampling. Leslie Kish . *American Journal of Sociology*. <https://doi.org/10.1086/224359>
- Tong, V., Raynor, D. K., & Aslani, P. (2014). Design and comprehensibility of over-the-counter product labels and leaflets: a narrative review. *International Journal of Clinical Pharmacy*. <https://doi.org/10.1007/s11096-014-9975-0>
- Vander Stichele, R. H., De Potter, B., Vyncke, P., & Bogaert, M. G. (1996). Attitude of physicians toward patient package inserts for medication information in Belgium. *Patient Education and Counseling*. [https://doi.org/10.1016/0738-3991\(96\)00866-X](https://doi.org/10.1016/0738-3991(96)00866-X)
- Vrijens, B., Antoniou, S., Burnier, M., de la Sierra, A., & Volpe, M. (2017). Current situation of medication adherence in hypertension. *Frontiers in Pharmacology*. <https://doi.org/10.3389/fphar.2017.00100>
- World Health Organization. (2013). *Exploring patient participation in reducing health-care-related safety risks*. WHO: Geneva. <https://doi.org/978-92-890-0294-3>
- World Health Organization. (2015). Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals. *World Health Organisation*. <https://doi.org/978-92-4-156511-0>
- Young, A., Tordoff, J., Leitch, S., & Smith, A. (2018). Doctors and pharmacists provision and opinions of medicines information leaflets in New Zealand. *International*

