



RESEARCH ARTICLE

“If Symptoms Persist after Three Days, Consult your Doctor”: Exploring Patients’ Health-Seeking Behaviours and Adherence to Drug Information Leaflets

Olayinka Susan Ogundoyin Ph.D^{1*}, Daniel Ikesinachi Nwogwugwu², Joseph B. Ayantade³, Tamunodiepreye Atubokiki⁴

^{1,4} Mass Communication Programme, Bowen University, Iwo, Nigeria

² Department of Communication Studies, Northeastern University, USA

³ Communication Arts Programme, Bowen University, Iwo, Nigeria

ARTICLE INFO

ABSTRACT

Received: May 22, 2024

Accepted: Jun 27, 2024

Keywords

Consumer Health Information

Drug Information

Adherence Reactions

Patients

Public Health Professionals

Drug Information Leaflets (DILs) are key channels through which patients can acquire health information about medications. They provide comprehensive details about drug composition, dosage, contra-indications, indications, side effects, and precautions. While previous focused on DILs benefits for patients, less attention has examined users’ adherence to treatments. This study investigates users’ behaviours in seeking drug information and adherence to treatment. The Theory of Reasoned Action framed this study, while data was collected from 248 online survey respondents and 14 focus group discussions (FGD) participants selected through purposive and convenience sampling techniques. Findings showed that respondents actively read DILs and primarily sought information from healthcare professionals. Also, understanding the DILs positively correlated with adherence to drug instructions. The drug type, cost and intention to read DILs showed correlations, however, respondents were divided if an ailment’s severity would lead them to read DILs. Although there was a correlation between the type, drug cost and intention to read DILs, respondents were divided on whether an ailment’s severity would lead to an intention to read DILs. In conclusion, this study suggests that seeking drug information improves adherence to drug use.

***Corresponding Author:**

olayinka.ogundoyin@bowen.ed
u.ng

INTRODUCTION

Acquiring drug information is crucial for ensuring positive patient health outcomes through effective drug usage. One primary means of accessing drug information is through Drug Information Leaflets (DILs), also known as Patient Information Leaflets (PILs). These written documents contain essential medication information and serve to familiarise patients with their prescribed drugs (Susic, Klemenc-Ketis & Kersnik, 2014). DILs accompany most drugs and provide critical information about drug composition, dosage, contra-indications, properties, indications, side effects, and precautions. Hence, patients need to be acquainted with this information, as many ailments globally depend on modern medicine for treatment and cure. Therefore, healthcare professionals provide prescriptions for patients' responsible and effective use of drugs. DILs further enhance health information, which is why Owusu, Yeboah, Aboagye, Amengor, and Entsie (2020) reiterate the need for DILs to be written in simple and clear language.

Recent trends in medical consultation have seen a shift towards a patient-centered approach, allowing patients to seek health information before and after consultations with their doctors.

Therefore, the enclosed DILs are intended to support patients in the decision-making process regarding medication adherence (Clerehan, Hirsh & Buchbinder, 2009). Patients must be provided with enlightening drug information as it will readily assist them in comprehending the needed drug information. Access to drug information through leaflets has been shown to improve health outcomes, quality of life, reduce anxiety, facilitate early detection of adverse side effects, and enhance patients' understanding of treatment regimens (Dickinson, Raynor and Duman, 2001, as cited by Clerehan et al., 2009).

However, it has been observed that reading DIL is not a common practice among users. Nonetheless, its purpose is to ensure the safe and effective use of drugs purchased directly Over the Counter (OTC) or as prescribed by health professionals. However, despite the availability of drug information, our initial pre-test revealed that some users do not see the need to read the information leaflets, mainly when their doctors have prescribed the dosage. Furthermore, individuals who do read the DILs may be discouraged from adhering to the medication due to potential adverse side effects. This lack of treatment adherence can threaten these individuals' quality of life.

While previous studies have examined various aspects of DILs, such as their benefits and effectiveness (Carter et al., 2013), readability (Marino 2019), and information inadequacies (Win and Anantachoti, 2022), there has been limited focus on investigating patients' DIL-seeking behaviours, understanding, and adherence to treatment. Therefore, our study aims to contribute to the DIL literature by investigating users' behaviours related to seeking drug information and their adherence to treatment. Specifically, our objectives include investigating the factors that enable users to read DILs, their levels of adherence to the information read, and exploring the correlations between DILs, drug costs, types, and the severity of ailments. We hypothesise that an interest in DILs will lead users to read and adhere to the dosage instructions.

Drug information leaflets

Drug Information Leaflets (DILs), or Product Information Leaflets (PILs), serve as a crucial source of information, communication, reinforcement, and education for patients considering medication use. DILs play a vital role in enhancing health literacy, which is defined as the knowledge and social skills needed to effectively access, understand, and utilise health information to promote and maintain good health (Nutbeam, 1998). Therefore, research has linked poor health literacy to non-compliance with quality health practices (Smith, Brice, & Lee, 2012).

Also, scholarly discussions have highlighted the effectiveness of DILs (Carter et al., 2013; Win and Anantachoti, 2022). While some DILs are criticised for being unattractive, others are lengthy and written in small, difficult-to-read fonts. Furthermore, many DILs contain medical jargon that may hinder communication with the average reader, raising questions about whether drug manufacturers prioritise impressiveness over effectively reaching their target audience. Often, the information presented in these leaflets can overwhelm patients, undermining the intended purpose of these materials. For instance, let us consider the information leaflet for ANNTIFAA FORTE (Artemether 80mg & Lumefantrine 480mg Tablets), a malaria medication. A section of the leaflet mentions "...use of QT Prolonging Drugs and other Antimalarial" without providing a prior explanation of the abbreviation "QT." Hence, this oversight can lead to confusion for patients who may not understand its meaning. Additionally, the term "QT" is not clarified elsewhere in the leaflet, further contributing to potential misunderstandings.

One significant factor influencing the understanding of Drug Information Leaflets (DILs) is the literacy level of drug users (Beusekom et al., 2016). In a study conducted by Win and Anantachoti (2022) on the effect of drug information provided by pharmacists and DILs on carton boxes in Myanmar, inadequacies were found in the information provided by both pharmacists and DILs. The study revealed that the information on the DIL was predominantly in English, which differs from the official Burmese language spoken by the people, posing an assimilation challenge for the users. This issue is also evident in Nigeria, where many DILs are written in English for users whose first language (L1) is not English. While various factors may impact the understanding and assimilation of information provided on DILs to meet the information-seeking behaviours of patients, this study aims to measure the level of interest that patients in Nigeria have in DILs. This is particularly crucial given the observation that patients often show more interest in the recommended dosage than in

information on potential side effects. Despite the Sustainable Development Goal 4 (SDG 4) advocating for inclusive and equitable quality education while promoting lifelong learning, Africa and Nigeria still have progress to be made.

Another critical factor is the readability of these leaflets, which has been the subject of significant scholarly attention (Freda, Damus, Merkatz 1999; Pires, Vigario, & Cavaco 2015; Piñero-López, Modamio, Lastra, & Mariño 2016; and Piñero-López, Figueiredo-Escribá, Modamio, Lastra, & Marino 2019). These studies suggest that drug information leaflets should be written to enhance readability, making them more easily understandable, especially for children aged 11 to 12 (Doak, Doak & Root, 1996). It is also recommended that the information be kept at a manageable length, as lengthy leaflets have been found to discourage reading and increase readability difficulty (Beusekom et al., 2016). For example, Piñero-López, Modamio, Lastra, & Mariño (2016) studied the readability of drug information leaflets available on the internet from 2007 to 2013 and found that despite the 2009 European Commission's regulation on the readability of these leaflets, there was no improvement (Piñero-López et al., 2016). Additionally, Pines (2015) highlighted the concern that drug information leaflets could cause fear in patients, potentially leading to non-adherence to the treatment procedure after reading the provided information.

One crucial role of Drug Information Leaflets (DILs) is to provide patients with essential information about drug dosage, contraindications, and potential side effects. We argue that given the fallibility of human memory, patients often rely on verbal instructions from healthcare professionals, making DILs an essential source of drug-related reminders. Additionally, DILs can assist patients in adjusting certain behaviours or lifestyles that may impact the effectiveness of their medication (Clausen, Juhl, and Rydahl, 2016).

Hence, while some have proposed the involvement of trained healthcare professionals to guide patients in understanding DIL information (Ashok et al., 2017; Medina et al., 2021), the feasibility of this approach in Nigeria is questionable. This is due to the insufficient healthcare workforce and the likelihood that patients may have left the healthcare facility or pharmacy before reviewing the DILs. Many users who are interested in reading DILs often read them at home. At that point, will they call their doctors who are already attending to other patients for explanations? Unlike in Europe, where regulations mandate clear and understandable DILs, there is a lack of similar regulations in Africa that consider the diverse languages spoken and cater to the interests of African populations.

Theoretical framework

This study is rooted in the Theory of Reasoned Action (TRA), which suggests that most behaviours are within an individual's control and choice. It further proposes that the intention to engage in a behaviour is the primary determinant and the most reliable predictor of that behaviour (Sutton, 1997). This implies that a person's likelihood of performing a behaviour is often influenced by their attitudes toward it, including their positive or negative thoughts and evaluations of the behaviour's outcomes. Additionally, it is influenced by subjective norms, such as the perceived expectations of essential individuals (e.g., family or co-workers) regarding the person's behaviour and the inclination to comply with others' directives. These individual behaviours culminate in action. This theory will aid in understanding how the behavioural intentions of reading Drug Information Leaflets (DILs) can lead to reasoned action by adhering to or not adhering to the drug information.

MATERIALS AND METHODS

The study was carried out among patient respondents in Nigeria. We employed an online survey through Google Forms to recruit respondents to the study. Data was purposively collected from March 2022 to May 2022, and all respondents who received new medications from approved physicians in hospitals, pharmacies, and chemists within the study period were eligible to participate in the study. An initial pilot study was conducted in Ejigbo, a semi-urban area of Osun State, Nigeria, among residents who received medications from approved healthcare professionals. They were excluded from the final study while their opinions were useful in redesigning the survey instrument for the main study. A total of 325 (100%) respondents consented to participate in the study. However, 248 (76.3%) respondents who purchased medications, reviewed the leaflets within the study period and resided in semi-urban and urban communities were included in the study. In

comparison, 77 (23.7%) respondents who purchased drugs but did not read the DIL were excluded. As part of our exclusion criteria, respondents with severe ailments or those who purchased drugs for their sick friends or relatives were not included. Female respondents were strongly encouraged to participate. Qualitative data was gathered through Focus Group Discussions (FGD) with fourteen (14) participants, while quantitative data was collected from 248 survey respondents. Data was analysed using simple frequency percentages and Chi-square for quantitative analysis and thematic explanation for qualitative analysis. The data sets were merged for discussion.

RESULTS

Table 1: Summary of respondents' characteristics

| | | | Frequency | Per cent | Valid Percent |
|--------------------------------|----------------|---------------|-------------|--------------|---------------|
| Gender | Valid | Women | 152 | 46.8 | 61.3 |
| | | Men | 96 | 29.5 | 38.7 |
| | | Total | 248 | 76.3 | 100.0 |
| | Missing | System | 77 | 23.7 | |
| | | Total | 325 | 100 | 100 |
| Age Range | Valid | 18 - 25 years | 70 | 21.5 | 28.2 |
| | | 26 - 30 years | 29 | 8.9 | 11.7 |
| | | 31 - 40 years | 72 | 22.1 | 29.0 |
| | | 41 - 50 years | 51 | 15.7 | 20.6 |
| | | 51 - 60 years | 21 | 6.5 | 8.5 |
| | | 61 - above | 5 | 1.5 | 2.0 |
| | | Total | 248 | 76.2 | 100.0 |
| | Missing | System | 77 | 23.8 | |
| | Total | 325 | 100 | 100.0 | |
| | JSSCE/SSCE | 11 | 3.4 | 4.4 | |
| | OND/HND | 39 | 12 | 15.7 | |
| Highest Education Level | Bachelors | 128 | 39.4 | 51.6 | |
| | MBBS | 2 | 0.6 | 0.8 | |
| | Masters | 53 | 16.3 | 21.4 | |
| | PhD | 10 | 3.1 | 4.0 | |
| | Others | 5 | 1.5 | 2.0 | |
| | Total | 248 | 76.3 | 100.0 | |
| | Missing System | 77 | 23.7 | | |
| | Total | 325 | 100 | 100.0 | |

Data from Table 1 revealed more female (61.3%) to male (38.7%) respondents, while a higher percentage of respondents were 18 – 25 years (28.2%) and 31 – 40 years (29%). The least respondents are 61 years and above (2%). Information about their levels of education shows that there are more respondents with tertiary education. The results imply that the respondents are expected to be knowledgeable in responding to the questions raised for the study. The respondents and participants for this study were divided into urban and semi-urban areas in Nigeria. Those from urban areas include residents from Ibadan, Lagos, Osogbo, Abuja, Enugu, Ede, Kano, Port Harcourt, Abeokuta, Ado Ekiti, Ondo and Delta, while those from the semi-urban areas include residents from Oyo, Iwo, owode-edo, ifako, Ogbomoso, and Oluponna.

Table 2: Respondents sources of information on prescribed drugs

| | | Frequency | Per cent | Valid Percent |
|------------------------------------|--------------------------|------------|-------------|---------------|
| Sources of Prescribed Drugs | Doctor's | 155 | 62.5 | 67.4 |
| | DIL | 53 | 21.4 | 21.8 |
| | Pharmacists/ Chemists | 14 | 5.6 | 6.1 |
| | Friends/Relatives | 8 | 3.2 | 3.8 |
| | Total | 230 | 92.7 | 99.1 |

| | | | | |
|--|----------------|-----|-------|-------|
| | Missing System | 18 | 7.2 | 0.9 |
| | Total | 248 | 100.0 | 100.0 |

The results from Table 2 reveal that most respondents (62.5%) receive information on prescribed drugs from their doctors, while the least (3.2%) respondents receive information from friends and relatives. Others receive information from drug information leaflets (21.4%), and pharmacists/chemists (5.6%). The results imply that doctors are the main sources of information on prescribed drugs.

In another result, data reveals that more respondents (61.7%) read drug information leaflets once they purchase drugs (*very*) often than those who *sometimes* (31.9%) read and those who read *not very often* (6.4%). Furthermore, more respondents read drug information leaflets *before* taking the drugs (96.4%) than 3.6% of respondents who read DIL *after* taking the drugs.

Similarly, qualitative data from the focus group discussions reveal the following as reasons for reading the DIL: to get more information about the drug, to check the required dosage and side effects, and to ensure that the drug is right for the ailment and health condition. Other respondents read the DIL to check the drugs' composition, identify their expiry dates, and find out if allergic substances were used as materials for the drugs.

Table 3: Respondents' understanding of DIL content

| | | Frequency | Per cent | Valid Percent |
|-------------------------------------|--------------------|-----------|----------|---------------|
| Understanding of DIL content | Very Great Extent | 60 | 24.2 | 24.2 |
| | Great Extent | 136 | 54.8 | 54.8 |
| | Little Extent | 48 | 19.4 | 19.4 |
| | Very Little Extent | 4 | 1.6 | 1.6 |
| | Total | 248 | 100.0 | 100.0 |

Data from Table 3 reveal that a little above half of the entire respondents (54.8%) understand the DIL content to a *great extent*, while fewer respondents understand to a *small extent* 19.4%, and a *very little extent* 1.6%. This could imply that although slightly more people understand the DIL content, there are more who may not understand the content.

Table 4: Portion of the DILs frequently read by respondents

| | Frequency | Per cent | Valid Percent |
|----------------------------------|-----------|----------|---------------|
| Side Effects | 82 | 33.1 | 33.2 |
| Dosage and administration | 80 | 32.3 | 32.4 |
| Precautions for use | 45 | 18.1 | 18.2 |
| Drug composition | 20 | 8.1 | 8.1 |
| Pharmaceutical properties | 7 | 2.8 | 2.8 |
| Contraindications | 13 | 5.2 | 5.3 |
| Total | 247 | 99.5 | 100 |
| Missing System | 1 | 0.4 | |
| Total | 248 | 100.0 | 100.0 |

The data reveals that respondents read through drug information side effects (33.1%), dosage and administration (32.3%), and precautions for use (18.1%) than the drug's pharmaceutical properties (2.8%), contraindications (5.2%) and the drug's composition (8.1%). A closer look at this data could

imply that more respondents are concerned with reading each purchased drugs' side effects and dosage than other portions.

Table 5: The extent to which DIL side effects encourage respondents to use the drugs for the recommended days and Usefulness to treatment adherence

| | | Frequency | Per cent | Usefulness of DIL to respondents adherence to treatment | | Frequency | Per cent |
|-------|--------------------|------------|--------------|---|--|-------------|--------------|
| Valid | Very Great Extent | 48 | 19.4 | | | Very Useful | 161 |
| | Great Extent | 124 | 50.0 | Useful | | 84 | 33.9 |
| | Little Extent | 63 | 25.4 | Not Useful | | 3 | 1.2 |
| | Very Little Extent | 13 | 5.2 | | | | |
| | Total | 248 | 100.0 | Total | | 248 | 100.0 |

The data from Table 5 reveal that despite the drug's side effects as contained in the DIL, most respondents (50%) and (19.4%) respectively, are encouraged to take the drugs for the prescribed days, while the others are not encouraged to take the drugs for the prescribed days. This further implies that although respondents read the side effects portion of DILs, not all of them adhere to the instructions on the recommended dosage; however, more respondents adhere to the recommended dosage. This further leads 98% respondents who find DIL (very) useful for their adherence to treatments, while 1.2% of the respondents do not find the DILs useful for their adherence to treatment.

In addition, qualitative data reveals how participants adhere to DIL instructions: taking the drugs with fluids, taking the drugs with meals, storing the drugs away from children, and understand what to do when a dose is missed. Data further reveals that they adhere to storing the drugs out of children's reach and understand the safe disposal methods after use.

Table 6: Reading DIL after a repeat drug purchase

| | | Frequency | Per cent | Valid Percent |
|-------|--------------|------------|--------------|---------------|
| Valid | Yes | 139 | 56.0 | 56.0 |
| | No | 109 | 44.0 | 44.0 |
| | Total | 248 | 100.0 | 100.0 |

The respondents are divided on their opinions if they would read the DIL after making repeated purchases for the same drugs. The data reveals that while 56% of respondents agree to read through the DIL when purchasing the same drugs again, 44% will not read it since they may have been familiar with its content.

Respondents who agreed to read the DIL over again when the same drug is purchased do so because they believe that there could be changes or updates in the DIL – such as the composition of the drugs; some read to refresh their memories of the side effects of the drugs, while others read to know if there is a consistency with the drug information. Furthermore, data reveals that others read the DIL to ascertain the genuineness of the drug and check for expiry dates and drug interactions, especially when combined with other drugs.

However, other respondents who do not read the DIL over when the same drug is purchased do so because they believe that they recall the drug information and do not need to reread it, while others believe that the DIL instructions would likely be the same. Others opine that if there were changes to the DIL, their doctors or pharmacists would inform them. Furthermore, the results reveal that more respondents believe that reading the DIL broadens their knowledge of the drug to a *great extent*, while fewer respondents believe that reading it broadens their knowledge of the drugs to a *little extent*.

Table 7: Type of drug and intention to read DIL

| Intention to read | Frequency | Per cent | | Frequency | Per cent |
|-------------------|-----------|----------|--|-----------|----------|
| Definitely | 104 | 41.9 | | 77 | 33.3 |

| | | | | | |
|----------------|-----|-------|--|------------|-----------|
| Sometimes | 53 | 21.4 | Ailment's severity and decision to read DIL | 37 | 16 |
| Not really | 58 | 23.4 | | 73 | 31.6 |
| Never | 33 | 13.3 | | 44 | 19 |
| Total | 248 | 100.0 | | 231 | 93 |
| Missing System | | | | 17 | 7 |
| Total | 248 | 100.0 | 248 | 100.0 | |

The data from Table 7 reveal that more respondents (41.9%) believe that the type of drug purchased *determines* if they will read the DIL, while 23.4% of the respondents agree that the type of drug purchased *does not determine* if they will read the DIL. In addition, 21.4% of the respondents believe that the type of drug purchased could *sometimes* influence their readership of the DIL, while 13.3% of the respondents opined that the type of drug purchased *never* influences their decision to read the DIL.

The data further reveal that the respondents' opinions are divided if the severity of the ailment determines whether they would read the DIL. The difference in the respondents' opinions who believe that the ailment will influence their decision to read the DIL (33.3%) is almost the same as those who will *not* read the DIL (31.6%), while those who *sometimes* read the DIL because of the urgency of the ailment (16%) are almost similar with those who will *never* read the DIL (19%).

Table 8: Cross-tabulation on the influence of DIL readership and drug type

Do you read DLI that accompany drugs when you buy * Does the type of drug influence DIL readership Crosstabulation

| | | | Does the type of drug influence DIL readership | | | | Total |
|---|-----|--|--|------------|-----------|------------|--------|
| | | | Never | Not really | Sometimes | Definitely | |
| Do you read DLI that accompany drugs when you buy | Yes | Count | 33 | 58 | 53 | 104 | 248 |
| | | Expected Count | 33.0 | 58.0 | 53.0 | 104.0 | 248.0 |
| | | % within Do you read DLI that accompany drugs when you buy | 13.3% | 23.4% | 21.4% | 41.9% | 100.0% |
| | | % within Does the type of drug influence DIL readership | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| | | % of Total | 13.3% | 23.4% | 21.4% | 41.9% | 100.0% |
| Total | | Count | 33 | 58 | 53 | 104 | 248 |
| | | Expected Count | 33.0 | 58.0 | 53.0 | 104.0 | 248.0 |
| | | % within Do you read DLI that accompany drugs when you buy | 13.3% | 23.4% | 21.4% | 41.9% | 100.0% |
| | | % within Does the type of drug influence DIL readership | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| | | % of Total | 13.3% | 23.4% | 21.4% | 41.9% | 100.0% |

Table 8 reveals that most respondents (41.9%) believe that the type of drug purchased influences them to read the DIL, while fewer respondents (13.3%) believe that the type of drug purchased does not influence them to read the DIL. This could imply that the type of drug purchased is a determinant of whether users will read the DILs.

Table 9: Ailment's severity and drug costs' influence on reading DIL

| Variable | N | Mean | Std. Deviation | Chi-Square Value | P-Value |
|---|-----|------|----------------|------------------|---------|
| Does the severity of the drug influence DIL readership? | 248 | 2.73 | 1.147 | 32.475 | <.001 |
| Will the Cost of Drugs affect the decision to read DIL? | 248 | 1.27 | .447 | | |
| Valid N (listwise) | 248 | | | | |

The results reveal a significant association (P-value < 0.05) between the severity of ailments and drug cost on the intention to read DIL. This implies that the severity of an ailment and the cost of drugs influence the decision to read DIL with a P-value (0.001), which is less than 0.005. However, the

likelihood of the ailment's severity influencing reading DIL is higher (SD 1.147) than the cost of the drug influencing reading DIL (SD 0.447).

Table 10: Cost of a drug and intention to read DIL

| | | Frequency | Per cent |
|--------------|-------|-----------|----------|
| Valid | Yes | 68 | 27.4 |
| | No | 180 | 72.6 |
| | Total | 248 | 100.0 |

The majority of 72.6% of respondents believe that the cost of their drugs does not influence their decision to read the DIL, while 27.4% of the respondents read the DIL because of the cost. Hence, more respondents believe that reading the DIL for any drug is not dependent on the cost. Further, qualitative data reveals that most respondents would still read the DIL irrespective of its cost. The participants who will not read the DIL because of the drugs' cost hinged their decisions on concerns for their health, the potency of the drugs, and the drugs' side effects on their health. Furthermore, these respondents believed that even though the drug cost was significant, they had formed the habit of reading DIL when drugs were purchased. On the other hand, participants who will read the DIL because of the cost argue that curiosity, comparison with other brands, and the drug's effectiveness are reasons for reading the DIL. They opine that when a drug is expensive, they are curious to know its components and how it differs from other less expensive drugs of different brands "for cost-benefit analysis." They also add that the cost of the drug will likely determine the side effects. Hence, they read the DIL when the drug is expensive.

Finally, the respondents believe that examples of some drugs they will not bother reading its information leaflets include *antioxidants* such as Vitamin C, *multivitamins*, and *analgesics* (painkillers). Other drugs include routinely prescribed *antibiotics*, *anaemia medications* such as blood tonics, cough syrups, *anti-reflux drugs*, *nitroimidazoles* such as Flagyl, and *sedatives* such as Piriton. On the other hand, however, respondents will often read the information leaflets on drugs such as *antimalarial*, newly and unfamiliar prescribed drugs, and any other drugs they buy and use.

DISCUSSION

Respondents' adherence to treatments

This research examined the drug information-seeking behaviour of 248 patients who had purchased, used, and read Drug Information Leaflets (DILs) within three months (March-May 2022). The results indicated that patients were actively reading DILs, a practice referred to as pharmacovigilance by Monkman and Kushniruk (2017), as cited in Jose and AlHajri (2018). Pharmacovigilance involves the detection, assessment, understanding, and prevention of adverse effects related to drugs. Out of the initial 325 respondents, 248 reported frequently reading DILs. Additionally, the respondents primarily sought information from healthcare professionals, which is consistent with the findings of Narhi & Helakorpi (2007), Carter, Moles, White & Chen (2013), and Pongpunna, Pratipanawatr and Jarernsiriornkul (2018). These results also support the assertion made by Jose and AlHajri (2018) that receiving appropriate and adequate information from healthcare professionals is a crucial step in involving patients in pharmacovigilance, which involves understanding and preventing adverse effects of drugs.

In relation to the first objective, which evaluated the respondents' compliance with treatments, the results indicate that the respondents followed the instructions on the Drug Information Leaflets (DIL) as they found the information highly beneficial. Their ability to comprehend the information on the DIL positively influenced their adherence to medication instructions. The qualitative data supporting the quantitative findings revealed that the respondents referred to the information leaflets to gain further insights about the medications. They sought details on the prescribed dosage, potential side effects, drug composition, and potential allergens, as well as to confirm the suitability of the medication for their condition. Burgener (2013) suggests that enhanced knowledge and comprehension of medication often enhance patient safety.

The DIL also broadened the respondents' understanding of essential information for each drug. An improvement in the DIL is evident, as Adepu et al. (2012), as cited in Pongpunna, Pratipanawat, and Jarernsripornkul (2018), previously noted that the DIL was challenging for respondents to comprehend due to excessive information and medical jargons. Adherence to the DIL was high, with more respondents adhering to taking the drugs with fluids, on the recommended schedule, following the prescribed timing, taking medications with meals, storing drugs out of reach of children, practising safe disposal methods, and knowing what to do when a dose was missed.

Factors necessitating respondents' intentions to read DIL

The findings indicated that respondents read DILs when the drugs are prescribed by their healthcare providers or when they make repeated purchases of the same drug. This further suggests that the respondents are proactive in reading DILs even after receiving the necessary dosage information from their doctors. The qualitative data revealed that respondents read DILs to stay informed about changes in the drug's composition, dosage, side effects, potency, and expiration dates, as well as to compare the drug with others and refresh their memory. On the other hand, respondents who did not read the DILs after a repeat purchase believed that the information would likely remain unchanged and that they could recall the necessary details from their previous purchase. The most frequently read sections of the DILs were the side effects, dosage and administration, and precautions for use.

Association between reading the DIL and the ailment's severity and drug cost

The results indicated that a higher number of respondents agreed that reading the DIL was linked to the type of prescribed drugs, consistent with the findings of Vinker, Eliyahu, and Yaphe (2007). Additionally, they expressed that the cost of the drug would not affect their decision to read the DIL, as they had developed a habit of doing so regardless of the drug's cost. Some respondents who felt that the cost of the drug could influence them mentioned that they were motivated by curiosity and a desire to compare different drug brands. However, opinions were divided on whether the severity of the ailment would impact their decision to read the DIL. The findings also showed that there was almost an equal split between those who believed that the ailment would influence their decision to read the DIL and those who did not. Nevertheless, slightly more respondents indicated that they would either not read the DIL at all or would not let the severity of the ailment influence their decision, compared to those who believed otherwise.

Additionally, the type of medication purchased often dictates whether patients will review the information leaflets. The study found that healthcare professionals (such as doctors, pharmacists, and chemists) are the primary sources of information on prescribed drugs. Also, patients are more likely to read the detailed information leaflets (DIL) for antimalarial drugs, newly prescribed medications, and unfamiliar drugs. However, they are less likely to review the DIL for antioxidant drugs, analgesics, commonly prescribed antibiotics, and some sedatives. Interestingly, the medication cost does not influence whether patients read the information leaflets, as they are accustomed to reviewing them for drugs necessary to treat severe conditions.

Lastly, this study validates the assumptions of the theory of reasoned action (TRA) which assumes that human behaviours are influenced by attitudes towards those things. In this study, respondents' behaviours to read and adhere to DILs were within their control and choices. Hence, reading the DILs (behaviour) influenced their attitude (adherence) towards it. They were further influenced by healthcare professionals, type and cost of drugs, and repeated purchases to read DILs.

CONCLUSION

Patients demonstrate active engagement with Drug Information Leaflets (DIL) as they seek to comprehend the information in prescribed drugs, primarily obtained from their healthcare specialists. Enhanced understanding of Drug Information Leaflets leads to improved safety for patients. Furthermore, reading these leaflets influences adherence to drug use, including taking the drugs with fluids, following the recommended schedule, adhering to the treatment plan, timing, taking drugs with meals, storing medications out of children's reach, safely disposing of medications,

and knowing what to do when a dose is missed. The study concludes that seeking information from Drug Information Leaflets enhances adherence to drug use.

Author contributions: All the authors contributed to the study in terms of conception, writing, reviewing, methodology, data curation, analysis, and editing.

Acknowledgments: All authors whose works were cited are duly listed in the references.

REFERENCES

- Ashok, K., Mathew, A. A., Thomas, A., Mohan, D., Gopalakrishna, R., & Reghu, R. (2017). Clinical Pharmacist's Interventions on Medication Adherence and Knowledge of Inflammatory Bowel Disease Patients. *Jyp*, 9 (3), 381–385. <http://doi:10.5530/jyp.2017.9.76>
- Beusekom, M. M., Grootens-Wiegers, P. & Bos, M. J. (2016) Low literacy and written drug information: information-seeking, leaflet evaluation and preferences, and roles for images. *International Journal of Clinical Pharmacy*, 38. 1372–9.
- Burgener, A. M. (2017). Enhancing communication to improve patient safety and to increase patient satisfaction. *Health Care Management*, 36, 238 – 243.
- Carter, S. R., Moles, R., White, L., & Chen, T. F. (2013). Medication information-seeking behaviour of patients who use multiple medicines: how does it affect adherence? *Patient Education and Counseling*, 4464: 1- 7. <http://dx.doi.org/10.1016/j.pec.2013.01.019>
- Clausen, J. A., Juhl, M., & Rydahl, E. (2016). Quality Assessment of Patient Leaflets on Misoprostol-Induced Labour: Does Written Information Adhere to International Standards for Patient Involvement and Informed Consent? *BMJ Open*, 6 (5), e011333. <https://doi:10.1136/bmjopen-2016-011333>
- Clerehan, R., Hirsh, D., & Buchbinder, R. (2009). Medication information leaflets for patients: The further validation of an analytic linguistic framework. *Communication & Medicine*, 6(2):117 – 127.
- Doak CC, Doak LG, & Root JH. (1996) Teaching patients with low literacy skills. 2nd ed. Philadelphia: JB Lippincott Company. 96. 16M.
- Freda, M. C., Damus, K. & Merkatz, I. R. (1999) Evaluation of the readability of ACOG patient education pamphlets. *Obstet Gynecol*, 93: 771–4.
- Jose, J., & AlHajri, L. (2018). Potential negative impact of informing patients about medication side effects: a systematic review. *International Journal of Clinical Pharmacy*, <https://doi.org/10.1007/s11096-018-0716-7>
- Medina-Córdoba M., Cadavid S, Pérez-Acosta M. & Amaya-Giraldo V., (2021) Factors that Facilitate and Hinder the Comprehension of Patient Information Leaflets (DILs): A Brief Scoping Review. *Frontiers in Pharmacology*, 12 (740334). <https://doi:10.3389/fphar.2021.740334>
- Narhi, U., & Helakorpi, S. (2007). Sources of medicine information in Finland. *Health Pol.*,84: 51 – 57.
- Nutbeam, D. (1998). Health promotion glossary. *Health Promotion International*, 13, 349–64
- Owusu F; Yeboah, G; Aboagye, R; Amengor C; & Entsie, P. (2020). The Role of Patient Information Leaflet in Patients' Medication Therapy: A Case Study within the Kumasi Metropolis of Ghana. Available at <https://www.pubmed.ncbi.nlm.nih.gov>
- Piñero-López, M. Á., Modamio, P., Lastra, C. F., & Mariño, E. L. (2016). Readability Analysis of the Package Leaflets for Biological Medicines Available on the Internet Between 2007 and 2013: An Analytical Longitudinal Study. *Journal of Medical Internet Research*, 18(5), e100. <https://doi.org/10.2196/jmir.5145>
- Piñero-López, M. Á., Figueiredo-Escribá, C., Modamio, P., Lastra, C. F., & Marino E.L. (2019) Readability assessment of package leaflets of biosimilars. *BMJ Open*, 9:e024837. doi:10.1136/bmjopen-2018-024837
- Pires C., Vigarío M., & Cavaco A. (2015) Readability of medicinal package leaflets: a systematic review. *Rev Saúde Pública*, 49:4 DOI:10.1590/S0034-8910.2015049005559.
- Pongpunna, S., Pratipanawat, T., & Jarernsiripornkul, N. (2018). Survey of outpatients' use and needs of patient medicine information leaflets in Thailand. *International Journal of Clinical Pharmacy*, <https://doi.org/10.1007/s11096-018-0748-z>
- Smith, P. C., Brice, J. H., & Lee, J. (2012). The relationship between functional health literacy and adherence to emergency department discharge instructions among Spanish-speaking patients. *Journal of the National Medical Association*, 104, 521–7.

- Susic, T., Klemenc-Ketis, Z. & Kersnik, J. (2014). Usefulness of the patient information leaflet (PIL) and information on medicines from professionals: a patient's view. A qualitative study. *Slovenian Medical Journal*, 83(5): 368-375.
- Sutton, S. (1997). Theory of planned behaviour. Cambridge handbook of psychology, health and medicine. Edited by: Baum A, Newman S, Weinman J, West R, McManus C., Cambridge: Cambridge University Press, 177-179
- Vinker, S., Eliyahu, V. & Yaphe, J. (2007). The effect of drug information leaflets on patient behaviour. *IMAJ*, 9: 383 – 386.
- Win, Z. N & Anantachoti, P. (2022). Evaluation of drug information from carton boxes, leaflets and pharmacy personnel: situation analysis in Myanmar. *International Journal of Pharmacy Practice*. 30(1): 52–58, <https://doi.org/10.1093/ijpp/riab070>