# Quality of Prescriptions in a Tertiary Care Hospital in South-West Nigeria

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**ABSTRACT**

The quality of prescribing influences to a large extent the health outcomes of patients as errors made could result in adverse drug reactions. The aim of this study was to assess the quality of prescription written by medical doctors in a tertiary healthcare facility in rural south-west Nigeria. A cross-sectional retrospective analysis of randomly selected prescriptions from all adult outpatient clinics of the hospital between October 1, 2010 and March 31, 2011 was carried out. The prescriptions were checked for the completeness of the patients' bio-data (name, age, sex, and hospital number), accuracy of drug dosage and formulation, prescribing by generic name, use of abbreviation, legibility of prescriber's writing, the name and signature of the prescriber. Six hundred and two (602) prescriptions were collected and used for analysis. A total of 2167 medications were prescribed with a mean of $3.6 \pm 1.6$ per encounter. All the prescriptions had patient's name and hospital numbers written. The age, hospital number and address of the patients was recorded in 421 (69.9%), 480 (79.7%) and 323 (53.7%) respectively. The doctor's name, signature and date of encounter was indicated 587 (97.5%), 546 (90.7%) and 556 (92.7%) respectively. The mean legibility score was $2.53 \pm 0.51$ out of a possible score 4. The findings of our study show that there is a need for improvement in the quality of prescription written by Nigerian doctors. The adoption of a computer –aided prescribing system would go a long way in achieving this objective.

## INTRODUCTION

A prescription is usually the end product of a patient-doctor encounter and its quality has significant impact on the outcome of this encounter. A prescription error has been described as "'a failure in the prescription writing process that results in a wrong instruction about one or more of the normal features of a prescription (Aronson, 2009). The essential components of a prescription include the identity of the recipient, the identity of the drug, the formulation, dose, route, timing, frequency, and duration of administration (deVries TPGM, 1994). Legibility or readability of the prescription is also an important component that may affect its quality and subsequently impact negatively on the patient (Hartel *et al.,* 2011). The number of drugs prescribed has been shown to have its relevance when discussing the quality of prescriptions as it may impact negatively on health and economic outcomes (Rambhade *et al.,* 2012). Prescribing by brands or generics is also another yardstick by

which the quality of prescriptions is measured because of availability and cost issues (Flegel, 2012). Studies from Europe, North and Central Africa have shown that issues with prescriptions remain a significant problem (Silverio and Leite, 2010, Yousif *et al.,* 2006, Makonnen *et al.,* 2002). Some of the reasons that have been identified include poor undergraduate and post-graduate medical training in clinical pharmacology and therapeutics, the ever increasing number of drugs, work-related factors and lack of regular audit and feedback (Heaton *et al.,* 2008, Ross *et al.,* 2013, Bertels *et al.,* 2013). Prescription errors have also been identified as a cause of adverse drug reactions with potential huge health and economic consequences. In Nigeria, Oshikoya et al have described the quality of prescriptions from the children outpatients department (Oshikoya and Ojo, 2007). However, there is a gap in knowledge especially as it relates to the quality of prescriptions in the adult outpatients department. The main objective of this study was to investigate the deficiencies in prescriptions from the adult outpatients departments of a tertiary centre in Nigeria.

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## METHODS

The study was carried out at the Federal Medical Centre, a healthcare facility located in Ido-Ekiti, South-West Nigeria. The centre provides secondary and tertiary level of care and is accredited for post-graduate medical training in Family Medicine, Internal Medicine, Paediatrics, Surgery, Psychiatry and Obstetrics and Gynaecology.

A cross-sectional retrospective analysis of randomly selected prescriptions from all outpatient clinics of the hospital between October 1, 2010 and March 31, 2011 was carried out. All prescriptions submitted to the central pharmacy from all outpatients' clinics of the hospital for the above mentioned months were collected by the investigators. One hundred (100) prescriptions were selected per month for five months and 102 for one month through stratified random sampling. The prescriptions were checked for the completeness of the patients' bio-data (name, age, sex, and hospital number), accuracy of drug dosage and formulation, prescribing by generic name, use of abbreviation, legibility of prescriber's writing, the name and signature of the prescriber.

The legibility of the prescribers was assessed by two doctors (one consultant and registrar) and a pharmacist using a rating scale adapted from a previous study (Akoria and Isah, 2009). Each of the assessors scored all the collected prescriptions anonymously using the rating scale. The rating scale used was an ordinal one with 0: completely illegible 1: fairly legible, 2: moderately legible, 3: clearly legible, 4: print quality. The mean rating score for the prescriptions was obtained by finding the average of the rating scores of the three assessors. The data retrieved was entered and descriptive analysis done using SPSS version 16 software.

### Ethical Consideration

Ethical clearance for the study was obtained from the Research Ethics Committee of the hospital before the commencement of the study.

### RESULTS

A total of 602 prescriptions were collected and used for analysis. All the prescriptions had patient's name and hospital numbers written. The age of the patients was recorded in 421 (69.9%) while the non-specific term of "Adult" was used instead of specific age on the remaining prescriptions. The hospital number was indicated in 480 (79.7%) while the address was present in only 323 (53.7%) of the prescriptions. The duration of use was indicated in 98.8% of the collected prescription while the dosage form was present in 99.7%. The route of administration was indicated correctly in 598 (99.3%) prescriptions. The doctor's name, signature and date was indicated 587 (97.5%), 546 (90.7%) and 556 (92.7%) respectively. The mean legibility score was 2.53 ± 0.51 out of a possible score 4.

Table 1 shows details of the assessors rating score. A total of 2167 medications were prescribed with a mean of 3.6 ± 1.6

per encounter. The minimal number of drug prescribed was one while the maximum was nine (9). Three hundred and thirteen (52%) prescriptions had less than 4 drugs while 289 (48%) had four or more drugs.

**Table. 1:** Mean scores of legibility and distribution by percentiles.

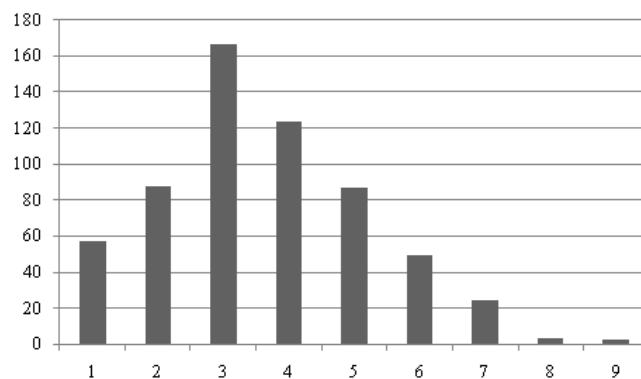|                       | D1   | D2   | P1   | Summary |
|-----------------------|------|------|------|---------|
| **No of prescriptions** | 602  | 602  | 601  | 602     |
| **Mean rating score**   | 2.64 | 2.55 | 2.40 | 2.53    |
| **Median rating score** | 3.0  | 3.0  | 2.0  | 2.70    |
| **Percentile**          |      |      |      |         |
| **25**                  | 2.0  | 2.0  | 2.0  | 2.3     |
| **50**                  | 3.0  | 3.0  | 2.0  | 2.7     |
| **75**                  | 3.0  | 3.0  | 3.0  | 3.0     |



**Fig. 1:** The detailed breakdown of number of drugs prescribed.

Prescribing by generic name was done in 61.6 % (± 30.2) of all drugs. The relationship between the numbers of drugs prescribed on one side and the legibility score and prescribing by generic name using Pearson's correlation was - .034 and -.032 respectively (Table 2).

**Table. 2:**

| Pearson's correlation | Total Number of Drugs (TND) | Percentage of drugs by generic (PBG) | Mean Legibility Score |
|-----------------------|-----------------------------|--------------------------------------|-----------------------|
| TND (Sig)             | 1                           | -.032 (.427)                         | -.034(.408)           |
| PBG (Sig)             | -.032                       | 1                                    | .158 (.000)           |
| Mean Legibility score (Sig) | -.034 (.408)          | .158 (.000)                          | 1                     |

### DISCUSSION

The patient identifier (name, hospital number and address) was present in 100%, 79.7% and 53.7% of the collected prescription respectively. In a study carried out in Sudan where three names were used, only 18.8% of prescriptions were in compliance while a Nepalese study also had 100% compliance (Yousif *et al.,* 2006, Ansari and Neupane, 2009). The relatively low level of filling in the address of the patients may be due to the pressure of work in the outpatients departments or the fact that this information already exists in the case notes. The age of patients was written in 69.9% of the prescriptions, higher than 50% recorded in an Ethiopian study (Makonnen *et al.,* 2002). The duration of use, dosage form and correct route of administration was indicated in 98.7%, 99.7% and 99.3% of the prescriptions

respectively; these values are higher than 25.7% (for duration of use) and 87% (route of administration) recorded in previous studies (Yousif *et al.,* 2006, Calligaris *et al.,* 2009). Being a medico-legal document, a prescription is required to have the full name of the prescribing doctor, his/her signature and the date. In our study, the name and signature of the prescribing doctor and the date were found in 97.5%, 90.7% and 92.4% of the prescriptions respectively. The physicians' names were present in only 6.7% of a previously quoted Sudanese study while only 33.3% and 43.9% of prescriptions from an Italian study had the signature of the prescribers and date of encounter (Rambhade *et al.,* 2012, Calligaris *et al.,* 2009). The average number of medicines per prescription was 3.6 ±1.6, close to the mean of 3±1.5 obtained in a Nigerian study (Adebayo and Hussain, 2009). Similarly, the mean number of prescribed drugs found in studies from other countries was 2.3 (Sudan), 1.83 (Nepal), 2.1 (Saudi Arabia) and 2.8 (India) (Cheraghali and Idries, 2009, Das *et al.,* 2011, Irshaid *et al.,* 2004, Bhartiy *et al.,* 2008). The differences in mean number of prescribed drugs in these studies may be due to prescribers training in rational use of medicines, geographical and epidemiological variation of diseases. In this study, prescribing by generic name was done in 61.6 ±30.2% of the prescriptions, higher than 41.9% and 42.7% found in previous Nigerian studies (Akande and Ologe, 2007, Tamuno and Fadare, 2012).

Our result was also significantly higher than that from similar Sudanese and Italian studies where generic prescribing was found in only 19.5% and 24.7% of prescriptions respectively (Yousif *et al.,* 2006, Di Paolo *et al.,* 2012). The influence of pharmaceutical companies on the prescribing habits of doctors may play a role in this abysmal low level of generic prescribing. Studies have shown that the influence of medical detailing has some effect on the prescribing pattern of doctors (Sondergaard *et al.,* 2009, Lieb and Brandtonies, 2010). This upward trend in generic prescribing could contribute to a reduction in healthcare cost especially out of pocket expenses that are predominant in developing countries. This result also suggests that various intervention strategies in the area of prescriber's education in Nigeria on rational use of medicines may have started yielding positive fruits. In our study, 93.5% of all prescriptions were classified as being moderately legible to print quality with the mean legibility score of 2.53. Another Nigerian study found only 20% of the prescriptions as clearly legible while Winslow et al reported 20% of medication orders as being illegible or legible with effort (Akoria and Isah, 2008, Winslow *et al.,* 1997). Legibility or readability of prescriptions is a very important quality as it reduces medication errors due to transcription. This type of preventable error includes dispensing of wrong dosage form, quantity or medications which may lead to significant harm of the patients. Recent studies have shown that there is indeed a high level of documentation errors in handwritten prescriptions and a comparison of the legibility between printed and written prescriptions revealed a statistically significant difference (Hartel *et al.,* 2011, Yousif *et al.,* 2011). Strategies that have been implemented to improve legibility of prescriptions include the use

of a computerized prescription order entry (CPOE) system and the use of computer –aided prescribing (Conroy *et al.,* 2007, Mirco *et al.,* 2005). These interventions have clearly shown a reduction in risk of prescribing errors in several studies (van Rosse *et al.,* 2009, Jayawardena *et al.,* 2007). Prescription writing in plain English without the use of abbreviations and Latin are other strategies that may improve the legibility of prescriptions and reduce prescribing errors (Benjamin, 2003).

## CONCLUSION

The findings of our study show that there is a need for improvement in the quality of prescription written by Nigerian doctors. Training of prescribers to focus on the little details of prescription writing and adoption of computer –aided prescribing system would go a long way in achieving this objective.

## STUDY LIMITATIONS

The major limitation of this study is the subjectivity of assessing the legibility of the prescriptions. This was addressed through the use of validated instrument by multiple assessors. Also being a retrospective study, it was not possible to know the context of the prescribing encounters.

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