Rational Use of Medicines in Nigeria: A Critical Review

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Abstract

Irrational use of medicines is capable of not only limiting access to medicine within a national healthcare system, it can also lead to a waste of scarce resources. In Nigeria, a number of studies exist that have explored rational use of medicines (RUM) in various settings and different conditions. Collectively however, little known is about these studies' knowledge gaps and areas of concentration.

A literature search was carried out in five major databases. Other aspects of the search strategy included scanning of conference abstracts, reference list searching and citation indexing. Articles selected using predetermined criteria were included in the bibliometric review and critical analysis.

Majority of RUM studies in Nigeria had been undertaken in the south-western region (52.6%), whereas the north-eastern and north-western regions had the least (7.0% and 3.5% respectively). A significant proportion of RUM studies were carried out in hospital settings (77.0%) neglecting other settings such as community pharmacies where only a small proportion of studies had been carried out (4.1%). Major themes that emerged from the review included hypertension, malaria and prescribing patterns, including the use of antibiotics.

Major gaps exist in RUM research in Nigeria. To improve this, stakeholders need to adopt a proactive strategy that includes addressing the gaps identified in this study, as well as instituting other relevant measures, such as developing relevant guideline and training practitioners outlined by the World Health Organisation.

Keywords: Nigeria; Rational use of Medicines; Critical Review; Policy

1. Background

The seriousness and magnanimity of irrational use of medicines cannot be over emphasised. According to the World Health Organisation (WHO), more than half of medicines prescribed, dispensed or sold globally are done inappropriately (WHO. 2014a). Also, there is evidence that suggests that about half of all patients who take these medicines for their ailments fail to take them correctly (Holloway and van Dijk, 2011). Generally, rational use of medicines (RUM) is described as when patients receive medications appropriate to their clinical and related health needs. The medications supplied to the patients should also be in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (WHO, 2002; 2004). Additionally, it has been acknowledged that the patient's perspective needs to also contribute to the perception of rationality with respect to how medicines are provided (Grand et al., 1999). This is an important consideration, as RUM can hardly be achieved without patients' concordance and adherence.

The various ways that medicines can be used irrationally have been well documented. In the literature, examples of irrational use of medicines include: polypharmacy, or the prescribing of too many medicines for a patient (Routledge et al., 2004); the inappropriate use of antimicrobials (Norris et al., 2011), often in inadequate dosage, and sometimes for non-bacterial infections; failure to prescribe following established clinical procedures (Younis et al., 2009) such as, national treatment guidelines and hospital policies; inappropriate self-medication (Kaushal et al., 2012), often of prescription-only medicines; and incidences relating to various types of non-adherence to dosing regimens by patients (van Dulmen et al., 2007).

Promotion of RUM is *sine qua non* for reasons of safety, good therapeutic outcomes and cost-effectiveness. WHO in recognition of these facts has put up strategies for the promotion of RUM across countries (WHO, 2014b). Specialised bodies such as agencies and Non-Governmental Organisations (NGOs) are also being used in some countries for the promotion of RUM based on the general principles of set out by the WHO. These strategies include: use of clinical guidelines; development and use of national essential medicines list; relevant training, both at undergraduate level and during professional practice; avoidance of perverse financial incentives; and public education about medicines (WHO, 2014a).

As healthcare provision moves towards a more patient-centred approach (Little et al., 2001), the concept of RUM becomes more central to healthcare systems' approach to improving access to medicines and healthcare to their various national populations. Similarly, the recent global economic crisis with its attendant scarcity of resources available for critical national sectors (including health) also impinges on the topicality of RUM. In Nigeria, lack of adequate funding is just one of the problems that currently beset healthcare provision. Available evidence suggests that over half of the population still lives below the poverty line, life expectancy at birth is still very low at 53/54 years (male/female), and other MDG related indices such as maternal mortality ratio and infant mortality rate are equally poor (WHO, 2013; USAID, 2013).

One thing is therefore clear. When drugs are not used rationally, there is an increased risk of wastage of scarce

resources and widespread health hazards. It also impacts on the level of access and quality of healthcare and medicines that are available to Nigerians. It is against this backdrop that this study aimed at undertaking a bibliographic review to better understand the existing evidence in this area, as well as critically review them with a view to identifying fresh perspectives to addressing RUM in Nigeria.

2. Methods

Bibliometric reviews are useful for obtaining information about research activity in specific areas, by looking at publication patterns using quantitative analysis and statistics (Gurney et al., 2012). Although this study adopted a bibliometric review approach, a critical analysis of the selected articles was also undertaken. This was done to enable a better understanding of the study area which can then underpin further research as well as help policy makers develop new strategies to improve rational use of drugs.

The review of the literature covered all full publications that appeared in English language biomedical journals between 1985 and 2013. The search strategy included a combination of key words indicating 'rational use of medicines' and 'Nigeria'. The literature search was carried out systematically using the following databases: Pubmed, CINAHL, International Pharmaceutical Abstracts, Science Direct and Google Scholar. Key words and phrases were used to focus the search and to identify relevant articles. In addition to this, sensitivity in the search was increased using wildcards and Boolean operators to ensure that all relevant articles within each database were captured.

Primary sources of government policies such as government publications and websites were consulted. Scanning of reference lists and citation indexing were carried out on the obtained papers. Colleagues were also asked for suggestions and conference abstracts were searched. Following the search, titles and abstracts were reviewed and if the relevant inclusion criteria were met, the articles were included in the review.

Titles and abstracts of the retrieved documents were examined to identify relevant articles. These include articles evaluating the different aspects of rational use of drugs such as self-medication, drug usage evaluation, adverse drug reaction and adherence to relevant guidelines. Only articles reporting primary and original research were included. Duplicates from various databases were eliminated and the selection was reviewed independently by two experienced researchers. Any disagreement about inclusion or exclusion of a specific article was resolved in a project meeting.

For the bibliographic analysis, data extracted from the selected articles were entered into a spread sheet for statistical analysis. (Microsoft Office Excel Windows 8 version) The variables registered for each article were: author; year of publication; year of study; journal title; design and area of study; type of population; health-care setting; geographical region; sample and population for the study; and outcomes of the study. Descriptive analyses of the relevant study variables were undertaken and the results were summarized in tables and figures.

For the critical analysis, throughout the selection phase, meetings were held between two experienced researchers to discuss and review emerging themes. After the relevant themes were identified, further project meetings were held to discuss the significance of the emergent themes.

3. Findings

Behind the decision to undertake the bibliometric analysis and critical review of selected articles, is the quest for a better understanding of relevant barriers and facilitators. The initial database search identified 1,345 articles, published from 1985 to 2013. Following elimination of duplicates as well as the application of the relevant screening and eligibility processes, 61 articles were selected for bibliometric analysis and critical discussion. All the relevant details relating to the search, screening and selection processes are presented in figure 1. In presenting the findings of this study two main approaches are adopted. Firstly, the results of the bibliometric analysis are presented graphically to enable a comparison of the key relevant variables. Secondly, the main themes that emerged from the review are presented with a critical analysis aimed at identifying where there are gaps in the knowledge as well as determining how best to address these gaps.
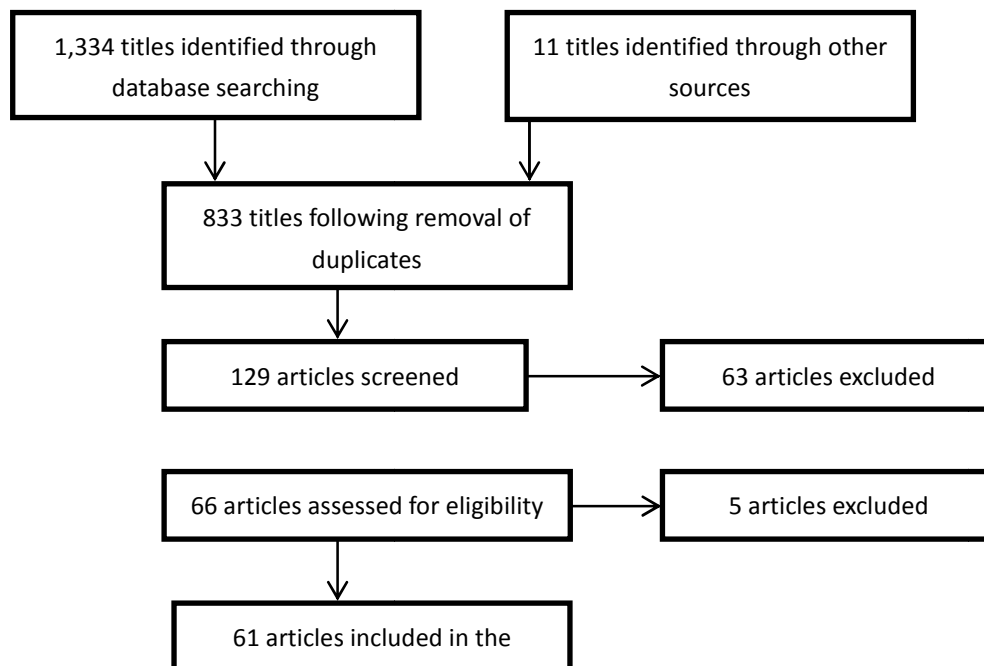
1,334 titles identified through database searching	11 titles identified through other sources

833 titles following removal of duplicates

129 articles screened	63 articles excluded

66 articles assessed for eligibility	5 articles excluded

61 articles included in the

Figure 1: Review flow diagram

3.1 Bibliometry

The study revealed that investigations relating to RUM had been undertaken in various healthcare settings. Figure 2 gives an overview of the various settings that emerged in the study. Studies undertaken in the hospital setting dominated in this category, while private health centres and community pharmacies were the settings which had hosted the smallest proportion of studies relating to rational drug use.
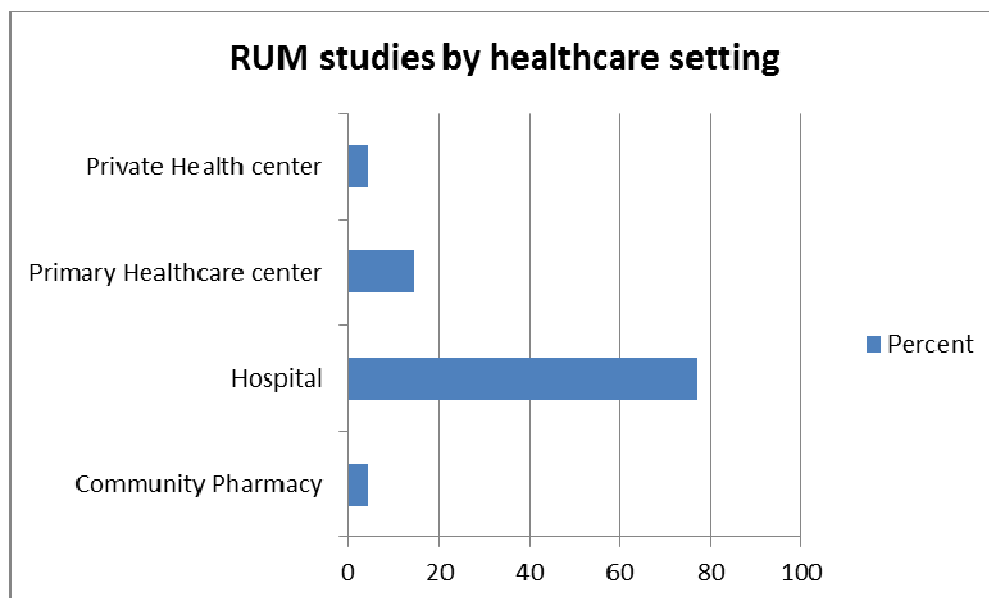

Figure 2: healthcare settings for studies in rational use of medicines

Nigeria is divided into six geo-political regions. Figure 3 shows the geographical spread of RUM studies undertaken in Nigeria. The findings indicate that the majority of the studies had been undertaken in the south-western region of the country. Very few studies had been undertaken in the northern part of the country, particularly the north-eastern and north-western regions.
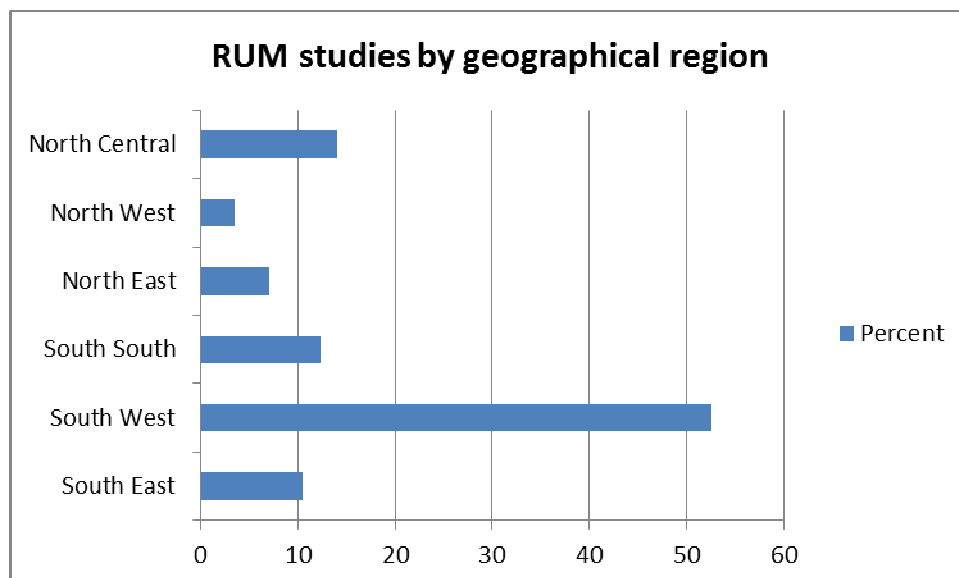
Figure 3: geographical spread of studies in rational use of medicines

Following the selection of the relevant articles for review, key themes that dominated research in RUM in Nigeria were identified. Figure 4 provides details of these themes in relation to their frequency of publication.
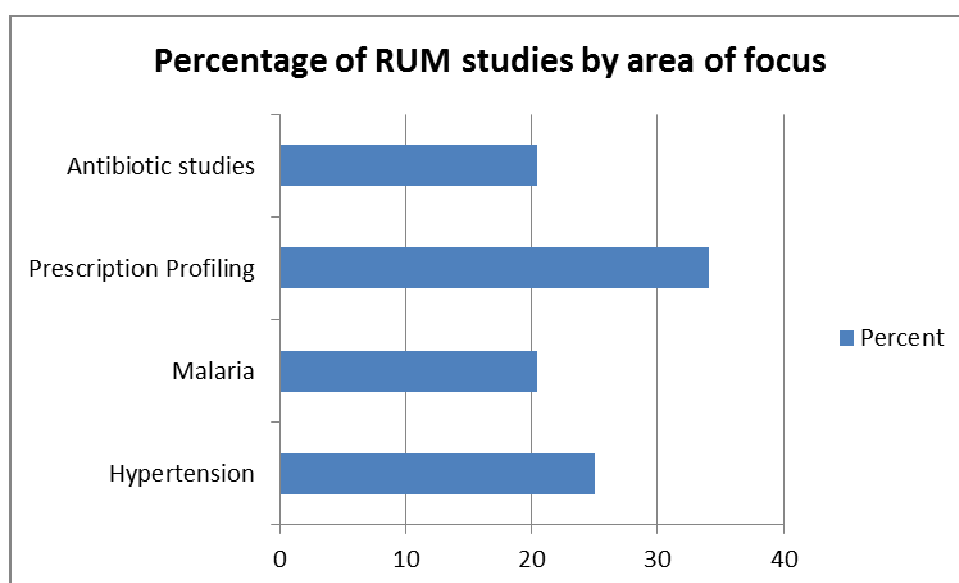

Figure 4: RUM studies by area of focus

It was revealed that prescription profiling was the most common research area in RUM. Studies relating to RUM in chemotherapy/prophylaxis of malaria, as well as rational use of antibiotics in various areas, were common. A critical review of these themes is presented in the following section.

3.2 Major Therapeutic Themes of Published Studies

3.2.1 Prescription Patterns and Misuse of Antibiotics

A number of the articles that explored rational use of antibiotics in Nigeria aimed at understanding prescribing behaviours of healthcare practitioners, in relation to various guidelines. For instance, Mgbahurike et al (2006), who looked at how prescribing behaviour in a Nigerian establishment conforms to international practices and found that prescribers knew but hardly practised according to established guidelines. There were indications that prescribers seldom undertook the necessary diagnostic measures before prescribing antibiotics and may also be prescribing them needlessly (Anyanwu and Aregbe-osula, 2006; Sadoh and Akinsete, 2009). Likewise, another study that explored prescription patterns in army hospitals identified a high rate of antibiotic prescribing as well as poor adherence to generic prescribing (49.3%). Although almost all (90.5%) the study participants were aware of the national essential drugs list, majority (58.1%) did not use it for their prescribing (Adebayo and Hussain, 2010). These findings were similar to other studies that identified irrational prescribing practices in terms of polypharmacy, misuse of antibiotics and low generic prescribing (Hogerzeil et al., 1993; Isah et al., 1997;

Olayemi et al., 2006; Akande and Ologe, 2007). These issues contribute to cost ineffectiveness in RUM and may help explain the relatively high cost of drugs in the country (Knox-Macauley, 1990; Enwere et al., 2007).

There were however studies that suggested that some progress had been made. Oyeyemi and Ogunleye's (2013) cross sectional study in Lagos found that less than half of the prescriptions contained antibiotics and that over three-quarters of medicines prescribed were done generically. They also found that a significant proportion of medicines were derived from the National Essential Drugs List (83.2%) and were available in the establishments (86.5%). Nevertheless, interventions like patient monitoring, better surveillance and infection control practices were recommended for the maintenance of medicines' therapeutic profiles (Akpede et al., 1995; Mokuolu et al., 2002; Fatoye et al., 2006; Iregbu et al., 2006; Nwadioha et al., 2011).

In other studies, a societal perspective was adopted to explore public knowledge and perceptions relating to the use of antibiotics. Findings here suggested a widespread use of un-prescribed antibiotics by the populace. It emerged that a quarter of university students used antibiotics to treat menstrual symptoms (Sakpota et al., 2010) and close to half of a sample of children in Enugu were administered un-prescribed antibiotics during their episode of diarrhoea (Ekwochi et al., 2013). Another key area that emerged in RUM in relation to antibiotics was adherence. In a study in Lagos, close to two-thirds of a sample investigated in relation to use of antibiotics, had adherence issues (Olanike and Ogunowo, 2011). In another study carried out in Benin, over half of the sample did not complete their antibiotic regimen (Yah et al., 2008).

3.2.2 Rational Drug use in Malaria

RUM in the treatment of malaria was an area that featured prominently in this review. Here, various approaches were adopted by researchers in exploring the rationality of drug use in the treatment of malaria in Nigeria. One perspective was the determination of antimalarial prescribing patterns. The study by Eniojukan et al (2009) indicated that less than half of the prescriptions with chloroquine from a number of Lagos hospitals included the correct dose of the medicine. On the other hand, in relation to the new treatment approach for malaria – artemisinin combination therapy (ACT), there were indications that so far, ACTs were safe and efficacious in treating uncomplicated P. falciparum malaria (Ojurogbe et al., 2013). Additionally, there is significant evidence that that polypharmacy remains a problem in the way medicines are prescribed (Akande and Ologe, 2007; Aina et al., 2009; Fadare et al., 2013; Adebayo and Hussain, 2010).

Worthy of significant focus was self-medication with antimalarials. Self- medication is common among the Nigerian populace especially in the treatment of malaria and the various studies explored medicines use, both from the buyers' and the sellers' perspectives. The findings suggest that more information/knowledge is needed on both sides. For healthcare practitioners without formal training or significant knowledge of medicines (medicine vendors for example), it is argued that the provision of some form of training in relation to standard treatment guidelines will improve the quality of care received by the populace in malaria treatment. This is because in many cases, they (medicine vendors) are the first line of contact for the treatment of malaria (Mabadeje and Tekobo, 2004).

Evidence from a study in south-eastern Nigeria where training provided to medicine vendors translated to an improvement in dispensing and compliance supports this argument (Okeke and Uzochukwu, 2009). Other studies that approached this issue from the patients' perspective found that patients with a lack of access to hospitals (for instance, in rural settings) were more predisposed to self-medication (Okeke and Okeibunor, 2010).

3.2.3 Rational Drug use in the Management of Hypertension

Two main perspectives that featured in the literature were prescribing according to the relevant guidelines by physicians, and the adherence to medication regimens by the patients. A quantitative survey of doctors' prescriptions in Benin City revealed evidence of irrational prescribing of calcium channel blockers for elderly patients and illustrates some practitioners' tendencies in this area (Erah et al., 2010). However, evidence somewhat suggests that RUM may be improving in some areas of intervention, particularly with respect to efficacy, safety, and pharmaco-economics. A study by Adigun et al (2003) explored the trends of prescriptions by comparing the findings of two cross sectional studies undertaken ten years apart. It revealed a significant improvement in rationality and efficacy in the treatment of hypertension. This finding was mirrored by other studies that concluded that in terms of anti-hypertensive pharmacotherapy in Nigeria, some prescribers were practising in line with current evidence based recommendations (Olanrewaju et al., 2010; Ojji et al., 2013).

From the patients' perspective, the evidence suggests that compliance and adherence to medication used in the management of hypertension remains sub-optimal in Nigeria. A mixed methods study that surveyed patients with hypertension, as well as undertook focus group discussions found that only about half of the sample demonstrated high compliance to their treatment regimen. Factors that were identified as contributing to adherence to treatment regimen in this area include adequate monitoring by healthcare professionals, avoiding complementary and alternative medicines and social support from family and friends (Osamor and Owumi, 2011).

Other factors that influenced adherence and compliance as well as treatment approaches include patient's attitudes and beliefs, co-morbidities, consultation failure on the part of clinicians, lack of finances, cost of

medicines and side effects of medications (Oyewo et al., 1989; Yusuff and Balogun, 2005; Amira and Okubadejo, 2007). Evidence also indicated that blood pressure control was significantly better among compliant patients than in non-compliant patients (Amira and Okubadejo, 2007).

4. Discussion

Some research has been undertaken in exploring RUM in Nigeria. The bibliometric approach adopted by this review however revealed a number of interesting findings. The majority of the studies undertaken were set in hospitals. This is similar to bibliometric studies on rational drug use in other countries. A recent study on RUM in Iran revealed that close to half (43.3%) of the relevant studies were undertaken in hospitals (Mousavi et al., 2013). While it is understandable that hospitals seem to be a familiar setting for such studies, it highlights a paucity of relevant information from other settings. Community pharmacy practice is one setting where little work has been done, despite the obvious potential in terms of patient patronage and professional capacity (Oshikoya et al., 2013; Oqua et al., 2013).

This study also revealed a great disparity between the south west region of the country where the most significant proportion of the studies had been carried out, compared to the much smaller proportions in the northern regions. In the northern part of the country, only the north central region had considerable research activity relating to rational drug use. The north east and north west had hosted the fewest research projects in this area. This could possibly be due to inadequate or non-sensitization of healthcare professionals in the regions to the relevance of RUM concepts and education. Another plausible factor may be the increase in violence in the area in recent years which has included fatal attacks on healthcare professionals (IRIN, 2014). The findings of this study not only provide a basis for further studies which can address the knowledge gap, it also reveals the need for the development of new strategies for research projects in these regions.

Internationally, the use and misuse of antibiotics is a research area of significant activity (Ojeniran et al., 2010; Mukonzo et al., 2013; bin Abdulhak et al., 2011; Meyer et al., 2013; Abasaeed et al., 2009). This is also reflected by the findings of our study. There are indications from our study that can help improve medication adherence relating to the use of antibiotics. Local and establishment specific guidelines such as formularies and standard treatment guidelines, need to be developed or adopted to guide prescribers (Wiseman et al., 2012). These need to be evaluated frequently. For patients, more work needs to be done to enlighten them on the importance of adherence, not only for antibiotics, but for all prescribed medicines. The dangers of non-adherence, such as the development of resistance and other related health related implications (Happi et al., 2006; Oshikoya and Ojo 2007; Aboderin et al., 2009; Chen et al., 2011; Kehinde and Ogunowo, 2011), should also be made known.

The therapeutic conditions where a significant amount of rational drug use research has been undertaken include malaria and hypertension. In recent years, the millennium development goals (MDGs) have increased focus on diseases prevalent in sub-Saharan Africa, with MDG-6 specifically targeting malaria (Fillipi et al., 2006). Moreover malaria ranks amongst the most prevalent (often times first) morbidities in health facility visits and therefore cannot be ignored. In the case of hypertension, this may be indicative of evidence suggesting that the burden of non-communicable diseases is shifting from developed to developing countries (Keats and Wiggins, 2014). However another explanation could be the level of funding that these diseases attract, in comparison to other health conditions (Siyanbola et al., 2012). The risk of this approach is the neglect of other equally important but unpopular healthcare conditions (Adigwe, 2014).

Based on the findings of this study, developing the capacity of frontline practitioners in Nigeria is critical to improving RUM in malaria, hypertension and other health areas (Abiodun, 1998; Chukwuani et al., 2002; Odusanya and Oyediran, 2004; Nwolisa et al., 2006; Adebayo et al., 2009). Relevant training pertaining to RUM should be incorporated in the formative stages of practitioners' careers (de Vries et al., 1995; Ogunnowo and Asuzu, 2003; Oshikoya et al., 2009). Other strategies that can significantly improve RUM include improving patients' information, involvement and engagement with this aspect of their healthcare. In these and other areas, the available evidence suggests that integrating innovative, multidisciplinary and collaborative approaches, together with proper contextualisation of the relevant interventions, would likely yield the best outcomes (Yinusa, 2004; Akoria and Isah, 2008; Akogun, 2011; Pondei et al., 2013).

The findings of this study suggest that in relation to RUM, existing knowledge gaps have not underpinned relevant research. The majority of studies have been focused in certain geographical regions, research settings and healthcare conditions, suggesting a disorganised and fragmented approach. Additionally, many of the existing studies have adopted a descriptive approach (prescription pattern studies mainly) (Tamuno, 2011; Olanrewaju et al., 2010; Etuk et al., 2008; Igun, 1987; Yusuff et al., 2008; Oyewo et al., 1989; Chukwuani et al., 2002; Tamuno and Fadare, 2012). In Nigeria, further exploration in RUM needs to be underpinned by more rigorous and analytical approaches. To enable the development of a comprehensive and robust evidence base that can enhance policy in RUM, more work has to be done in the areas where gaps have been identified.

Other important factors that can promote RUM in Nigeria are the provision and facilitation of current and comprehensive guidelines and tools (Ojeigbe et al., 1990; Ogbonna and Uneke, 2008; Uzockukwu et al., 2002;

Uzockukwu et al., 2011). Presently, the evidence suggests that important guidelines and other tools that can facilitate RUM in Nigeria are either unavailable, or out-dated (Alfa, 2013; Idris et al., 2014). This means that any evidence relating to therapeutic efficiency and cost effectiveness that have recently emerged may not impact on how healthcare practitioners provide medicines and healthcare to Nigerians. In other cases, robust frameworks exist which can significantly improve RUM, for instance, the National Drug Distribution Guideline, but this has been hindered by poor implementation strategies. The implication is that a lack of a robust approach in formulation and implementation strategies may not only hinder Nigerians' safe access to medicines, but also result in a waste of resources, for both the health care system, and the patients.

5. Conclusion

RUM in Nigeria can be significantly improved by providing better and continuous training for healthcare professionals as well as ensuring that patients and the public are sufficiently informed and engaged in matters concerning their medicines and health. However, unless more research projects are undertaken in certain regions of the country and practice settings, it will be difficult to develop a comprehensive or wide-spread evidence base to underpin policy and practice. Strategies to promote RUM exist and Nigeria needs to be proactive in adopting them. This can considerably improve access to medicines as well as ensure the provision of safe and high quality pharmaceuticals and healthcare services.

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