

RISK OF MEDICATION RELATED PROBLEMS AMONG ADULTS AGED > 50 YEARS IN A NIGERIAN TEACHING HOSPITAL

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ABSTRACT

Older adults are unique due to peculiarities in medicine use and medication related problems. To determine extent of risk of medication related problems (MRPs) and their relationship between extent of risk and socio-demographic variables among older adults. A cross sectional survey was conducted among 300 older adults (age >50 years) attending outpatient clinics of a Nigerian Teaching Hospital using a questionnaire. Analysis was done using IBM SPSS Statistics version 21. Significant P value was set at <0.05. Response rate was 66.3% (199/300) with 116 (58.3%) being females. Majority: were aged from 60-69 years 74 (37.2%), mean (SD) of age was 63.9 (7.93) years; 104 (52.3%) were traders. Most had risks related to taking 5 or more medication doses each day 125 (62.8%) and current use of medications for three or more medical problems 122 (61.3%). One (0.5%), 14 (7.0%) and 184 (92.5%) respondents were exposed to No Risk, Low and High risk of MRPs respectively. Relationship existed between income and level of risk (P=0.029) and respondents with income of 20,000-29,999 Naira 114 (57.3%) were at highest risk. Most older adults were at risk of MRPs and income had a role to play. These call for immediate educational, economic and behavioral interventions for all stakeholders.

Keywords- Elderly, Medications, Risk, Sagamu, Therapeutics

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INTRODUCTION

Events or circumstances involving drug therapy that actually, or potentially, interfere with an optimum outcome for the patient are referred to as medication related problems (MRPs) or drug therapy problems (DTPs) (MacKinnon, 2007; Hepler & Strand, 1990). Drug therapy problems occur in all patients however older people have an increased susceptibility to drug related problems due to altered pharmacokinetic and pharmacodynamic properties of drugs (Nikolaus *et al.*, 1996), the presence of polypharmacy and age-related physiological changes (Budnitz *et al.*, 2006). Older people are more likely to suffer from multiple conditions and are by far the greatest consumers of prescription medicines and over the counter (OTC) medicines. Between 14% and 23% of older adults receive a medication that should not have been

prescribed for them (Caterino *et al.*, 2004; Curtis *et al.*, 2004; Zhan *et al.*, 2001). From the foregoing, it is evident that older adults are at increased risk for adverse drug effects, 10% to 25% of patients have an adverse drug reaction or adverse drug (Gandhi *et al.*, 2003; Gurwitz *et al.*, 2003), therapeutic failure, intentional and non intentional non-compliance with medications. These suggest that much attention be paid to their health care.

The knowledge base relating to medication related problems in hospitals and in nursing home settings has grown substantially (Gurwitz *et al.*, 2003; Winterstein *et al.*, 2002; Heelon *et al.*, 2007; Sorensen *et al.*, 2005; Blix *et al.*, 2008; Witry *et al.*, 2011; Castellino *et al.*, 2011; Elliott & Woodward, 2011; Langford *et al.*, 2006; Rovers & Hagel 2012). However, only limited efforts have been

made to systematically examine the problem of medication related problems among the older population in the ambulatory setting especially in Nigeria (Fadare *et al.* 2013; Ogbonna *et al.*, 2014, Fadare *et al.* 2015 and Abdulraheem and Adeoye 2015). These motivated us to evaluate older patients in the ambulatory setting to determine the risk of medication related problems. Findings would inform the development and testing of interventions designed to reduce the risk of medication related problems among outpatients.

Materials and Methods

Study Setting

The study was carried out at the General Out-Patient Clinics of the Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu, Nigeria. The tertiary facility established in 1986 has 241 bed capacity and serves as a training centre for medical and pharmacy students. OOUTH has several departments (Medicine, Surgery, Community Medicine, Pharmacy, Medical records etc). OOUTH is known to have average patients' turnover of 974 in-patients and 6,486 out-patients per month (Ojieabu *et al.*, 2012).

Study design

The study employed a cross sectional, observational design. Older adult patients were taken as those from 50 years and above, based on WHO definition (WHO, 2006).

Sample Size Determination / Selection

Sample size was determined using a standard statistical formula (Oyejide, 1992) and p (percentage picking a choice, expressed as decimal) was obtained from a previous study (Lowe *et al.*, 2000).

Inclusion Criteria

Patients aged 50 years and above attending the outpatient clinics in the setting and who consented to respond to the survey.

Exclusion Criteria

Patients who were either too ill to be interviewed, inpatients or those who declined to be interviewed were excluded from the study.

Instruments for Data Collection

A questionnaire was adopted from the HbL Self-Administered Medication-Risk Questionnaire (MRQ) developed and validated by Barenholtz

Levy H (Levy, 2003) with a high overall inter-rater reliability ($r = 0.847$) and 9 of 10 individual questions matched well between the investigator and participants (kappa 0.4-0.6 for 3 questions; >0.6 for 6 questions). Test-retest reliability was significant for all 10 questions (kappa > 0.6). Internal consistency was acceptable (alpha = 0.69). The questionnaire has been used in other studies (McCarthy *et al.*, 2007; Makowsky *et al.*, 2014).

A section was included to gather data on socio-demographic characteristics of the respondents (age, sex, marital status and income). The second section was anchored on a 'yes' or 'no' response and had questions on current use of 5 or more medications; use of 12 or more medication doses each day, use of carbamazepin, lithium, quinidine, warfarin, digoxin, phenobarbitone or procainamide; current use of medications for 3 or more medical problems; change of medications or instructions for use; use of more than one prescribing physician; use of more than one pharmacy for refills; delivery of medicines to respondents' home; difficulty in following regimen instructions and lack of knowledge on reasons for use of medicines.

Data collection

After pretesting with ten patients, the questionnaires were administered to older adults either waiting to receive medications from the hospital pharmacy or those waiting to see their doctors at the general outpatient clinics. Explanations on how to complete the questionnaire were given and respondents having difficulty in understanding the questions were assisted where necessary. For instance those unable to complete the questionnaire were directly questioned and questions were translated verbally to the local language of those who could not understand English. The names and addresses of the patients were requested for follow up purposes.

Data analysis:

Responses were entered into Microsoft Excel and cross checked for accuracy before sorting and loaded into IBM SPSS Statistics Version 21 for further inferential statistical analysis. Each item in the 10 item MRQ was scored as "1" if the patient answered "yes" and "0" if the patient answers "no".

The sum of each item score represented the total risk score for each respondent. Question 3 was collapsed into a single "yes" or "no" response. Descriptive statistics were calculated for baseline patient characteristics as well as the frequency of each criterion and the number of patients with 0, 1, 2, 3, 4, 5, or more criteria. The total risk scores were categorized into 0 points = No risk; 1 -2 points = Low risk; 3-10 points =High Risk. Such methods have been used in previous studies (McCarthy *et al.*, 2007; Makowsky *et al.*, 2014). A P value of < 0.05 was interpreted as significant. Chi square test and one way ANOVA were used to test association between Socio-demographic variables and patients exposure to medication related risk.

Ethical Issues

Ethical approval was obtained from the Scientific and Ethical Review Committee of OOUTH Sagamu. Verbal consent was also sought and obtained from patients before issuing of questionnaires.

Results

Of the 300 questionnaires distributed to the older adults, 199 respondents completed the questionnaires fully giving a response rate of 66.3%.

Socio-demographic Characteristics

Majority of the elderly patients were females 116(58.3%) and the highest proportion of respondents were aged from 60-69 years 74(37.2%) with a mean (SD) age of 63.9 (7.93) years; a large number were traders 104 (52.3%) and most of them were married 124(62.3%). There was a significant association between gender and occupation (P = 0.005). Details of the socio-demographic variables by gender are shown in

Table 1.

Exposure to risk of medication related problems

Majority of the respondents had risks related to taking 5 or more medication doses each day 125(62.8%); current use of medications for three or more medical problems 122(61.3%) ; and Prescriptions filled at more than one Pharmacy 111(55.8%). There was a significant association between gender and someone bringing their medications to their home (P=0.005). **Table 2**

shows the proportion of respondents who indicated exposure to one risk or the other. Only 1 (0.5%) respondent was not exposed to any of the risk (No Risk). **Figure 1** shows the proportion of respondents by score "yes" while **Figure 2** shows the level of risk. There was a significant association between income of respondents and their level of risk (P=.029). Respondents with income in the range of 20,000-29,999 Naira were at highest risk 114(57.3%).

Respondents level of risk to Medication Related Problems was significantly related to their income (0.029) but not significantly related to age (0.311), Occupation(0.991), Education(0.479), Gender(0.307) and Marital Status (0.265).

Discussion

This baseline study on risk of exposure of older adults to medication related problems gave insightful findings of this study sample. Over ninety percent of the respondents were at high risk of MRPs and income of respondents had a role to play in their exposure.

There were more females than males. This distribution of gender obtained is similar to the findings of Schmader *et al.* (2004), whose high respondents were females (69%) (Schmader *et al.*, 2004). Based on the risk assessment questionnaire majority of them were at risk of medication related problems. A high percentage of the patients were still exposed to more than five medications (Major PP). This is an indication of the occurrence of major polypharmacy and it is defined as patients using more than four (4) drugs and minor polypharmacy is when a patient takes two (2) to four (4) drugs (Lars, 1998). The extensive use of medications by the geriatric population suggests that sizeable numbers of older persons are affected. The prevalence of prescription medication use among the ambulatory adult population increases with advancing age (Gurwitz *et al.*, 2003). Majority were at risk of medication related problems. Previous studies (Langford *et al.*, 2006; Rovers and Hagel, 2012; Fadare *et al.*, 2013) showed older adults as being exposed to medication related problems however values obtained in these studies differ from our study (14%, 39.4% and 25.5% respectively). A higher percentage of drug related

problems occur between the ages of 60 – 69 years; which is similar to a study carried out by Vinks *et al.* (2006), whose highest respondents were between the ages of 65 years and above.

A large number of the respondents were also taking drugs for three (3) or more medical problems and had their prescriptions filled at more than one pharmacy. This is common in Nigeria where one pharmacy may not stock all medicines at all times, sometimes prescription medicines may be obtained without the show of prescriptions. An unmistakable feature of the older adults is the high prevalence of chronic disease that affects a high consumption of drugs (Blasco Patino *et al.*, 2005; Laredo *et al.*, 2005). Majority of respondents who are currently taking medication for three or more medical problems are at high risk of drug therapy problems such as adverse drug reactions and other side effects. The total number of drugs that a person

ingests is the main factor associated with adverse effects, interactions, medication errors and lack of compliance (adherence). Optimal medication prescribing is highly recommended and use of medications should be tailored to the unique needs of the older adults. The high prevalence of morbidity among older adults found in this study is consistent with observations from another study (Beer, 1991). A higher prevalence of illness among elderly females compared to elderly males shows their vulnerability. Due to greater longevity, women constitute the majority of the older adults' population. Using the Beers' criteria (Beer, 1991), Phenobarbital was the most inappropriately prescribed medication, this is similar a study done by Chang *et al.* in 2004 (Chang *et al.*, 2004), where hypnotics and sedatives were mostly prescribed, medication inappropriateness occurred in 22.1% of respondents.

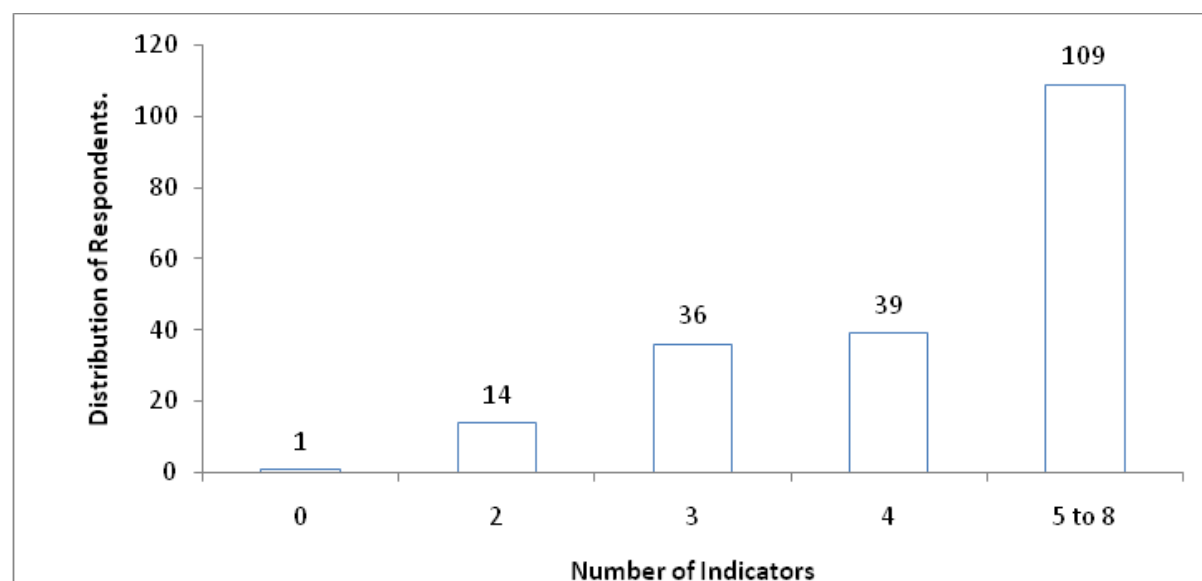
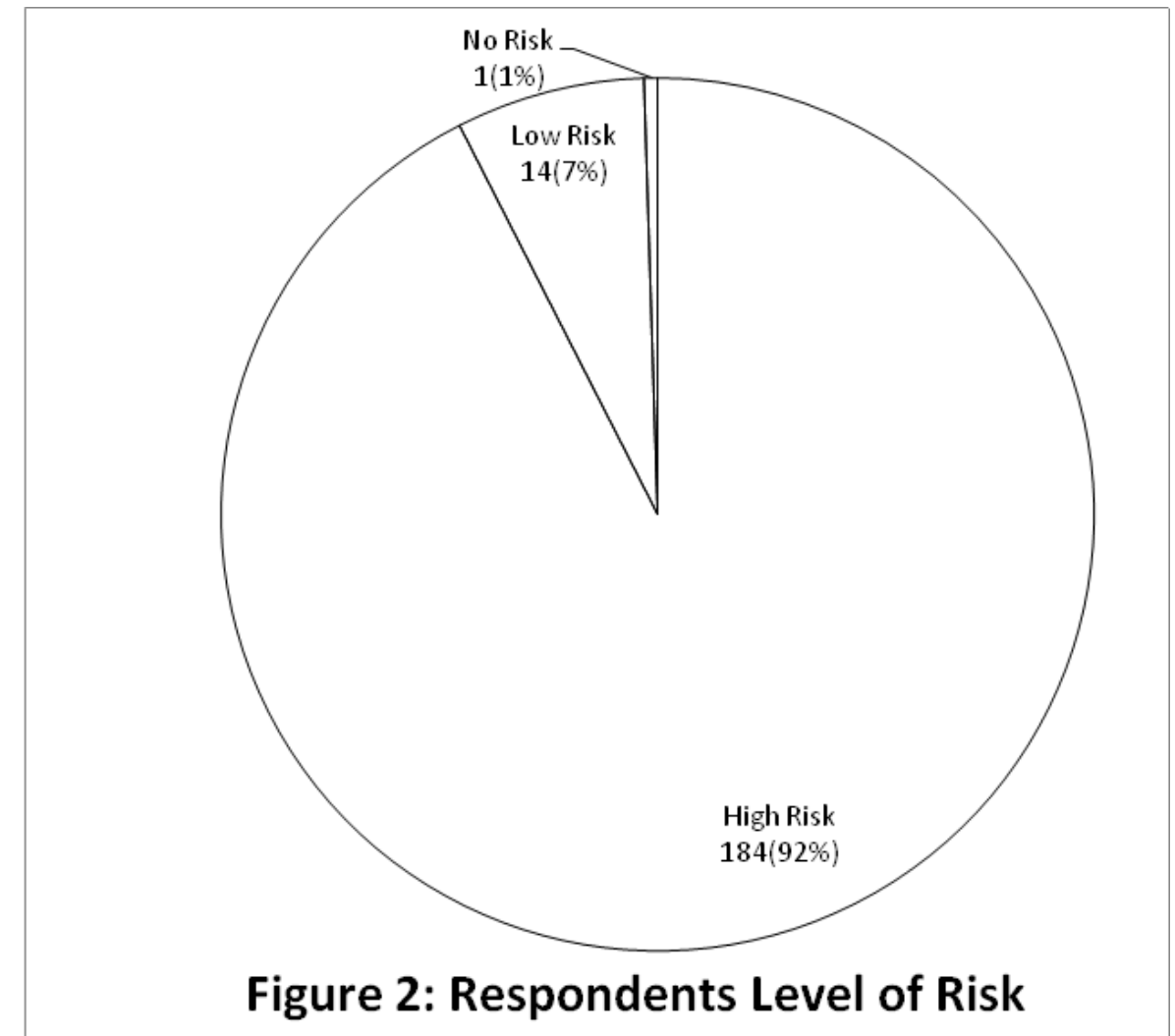
Table 1: Socio-demographic characteristics of older adults N=199

Characteristics	Total No (%)
Age (years)	
50 – 59	65 (32.7)
60 – 69	74 (37.2)
70 – 79	56 (28.1)
80 and above	4 (2.0)
Total	199 (100)
Marital Status	
Married	124 (62.3)
Divorced	38 (19.1)
Widowed	34 (17.1)
Single	03 (1.5)
Total	199 (100)
Education	
None	1 (0.5)
Primary	49 (24.6)
Secondary	112 (56.3)
Tertiary	37 (18.6)
Total	199 (100)
Occupation	
Trader	104 (52.3)
Retiree	33 (16.6)
Farming	17 (8.5)
Teacher	8 (4.0)
Civil servant	7 (3.5)
Clergy	03 (1.5)
Others*	27 (13.6)
Total	199 (100)
Income (in Naira)	
≤19,999	39 (19.6)
20,000-29,999	121 (60.8)
30,000-39,999	28 (14.1)
40,000-49,999	7 (3.5)
≥50,000	4 (2.0)
Total	199 (100)

*Others include electrician, bricklayers, printers, business men, drivers, tailors, welders, cleaners, housewife and herbalist

Table 2: 'YES' Response to MRQ Individual Items

Indicator Questions	YES (Total) No (%)
Do you take 5 or more medication doses each day?	125(62.8)
Are you currently taking medication for three or more medical problems?	122(61.3)
Do you get your prescription filled at more than one Pharmacy?	111(55.8)
Does more than one physician prescribe medication at regular basis?	107(53.8)
Does someone bring any of your medication to your home for you (such as delivery person from pharmacy or spouse)?	105(52.8)
Is difficult for you to follow your medications regimen or do you sometimes choose not to?	84(42.2)
Of all your medication is there any particular one you do not know the reason for taking it?	84(42.2)
Do you take any of the following medications: carbamazepines, lithium, phenytoin, quinidine, warfarin, digoxin, Phenobarbital, procainamide, theophylline?	82(41.2)
Have your medication or instruction on how to take them changed, four or more times this past year?	74(37.2)
Do you take more than 12 or more medication doses each day	35(17.6)

**Figure 1: Distribution of Respondents by Score "Yes"****Figure 2: Respondents Level of Risk****Conclusion**

From the findings it can be concluded that over ninety percent of respondents were at high risk of medication related problems and there was a significant relationship between income of respondents and level of risk. Use of medications should be tailored to the unique needs of older adults. This calls for instant educational, economic and behavioral interventions for all stake holders. Government should consider free health care services for patients of 50 years and above to improve outcome.

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