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AWARENESS AND ATTITUDE OF KHARTOUM STATE COMMUNITY PHARMACISTS TOWARDS CARDIOVASCULAR DISEASE SCREENING SERVICES

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ABSTRACT

Background: Providing cardiovascular diseases (CVDs) risk factor screening services is one way in which pharmacists can make a major contribution to improving patients' quality of life. **Objectives:** To investigate the awareness and attitude of community pharmacists towards CVDs screening services and explore barriers for implementation. Settings: Community pharmacies in Khartoum state. **Methods:** A non-interventional, descriptive, cross sectional study was conducted in a 190 community pharmacies using a pre-tested, self-administered questionnaire and a stratified, systematic random sampling procedure. Main outcome measures: Awareness and attitude of community pharmacists about CVDs screening services. **Results:** Response rate was 91%. Screening services were least recognized as part of pharmaceutical care services. The majority of participants agreed that screening services are important and claimed that they are useful for prevention of complications and early detection of diseases, and are offered for symptomatic patients. Hypertension and hyperlipidemia were highly rated, compared to diabetes and hyperthyroidism, as CVDs risk factors. Nevertheless, 78% of participants are willing to provide screening services, especially for hypertension and diabetes. Barriers included lack of knowledge, training, resources and time. Other barriers reported by participants are lack of customers' concern, interest and their refusal to such services, disapproval of pharmacy owners, the extensive burden of the service on the pharmacy and their contractual framework which does not include such services, in addition,

neither the time, assistance, private areas nor incentives are available. **Conclusion:** The awareness and willingness of screening services was fair, however, the current practice of such services for primary prevention of CVDs is poor, constrained by many barriers and needs fundamental development.

KEYWORDS: Pharmaceutical care, community pharmacy, screening services, cardiovascular diseases, risk assessment.

INTRODUCTION

CVDs takes the lives of 17.7 million people each year, an estimated 31% of all deaths worldwide. More than 75% of CVD deaths occur in low-income and middle-income countries and 80% of all CVD deaths are due to heart attacks and strokes.[1] CVDs are rated third of the top 10 causes of death in hospitals in the Sudan and hypertension and Diabetes Mellitus are two of the top 10 leading diseases for hospitals admission.[2] Screening services opportunistically identify people with unrecognized illnesses or risk factors that cause significant suffering, disability or death if detected at a later stage. Community pharmacists are the most readily accessible among health care providers and ideally placed to assist in the detection, education and referral of individuals at elevated risk of CVDs and similar conditions. Several reviews provided evidence of the value of pharmacist Professional Services in the Community Setting.[3–8] Evidence of effectiveness of community pharmacist interventions exists for lipids[9,10], diabetes[11,12], and hypertension[13–15] management. Preventive services such as weight management, osteoporosis and flu immunization were also reported.[5] Many studies approved successful community pharmacist interventions in identification and targeting asymptomatic individuals with high risks to develop CVDs and referral to practitioners for further follow up.[16–18] CVDs risk assessment had become a part of community pharmacists' clinical skills which are needed for pharmaceutical care (PC) practice.[19] Providing a CVDs risk factor screening service is one way in which pharmacists can make a main contribution to health education, health promotion and improving patients' quality of life. Sudan Ministry of Health's 25-years strategic plan (2004 – 2029) calls for more involvement of community pharmacists in the society.[20]

The aim of this study is to investigate the awareness, and attitude of Khartoum state community pharmacists towards CVDs risk assessment services.

METHODS

The study was approved by the Faculty of Pharmacy, University of Khartoum Ethical Research Committee.

Study design and setting

A non-interventional, descriptive cross-sectional community pharmacy-based survey was conducted from January - June 2015 in community pharmacies located in Khartoum state, the capital of the Sudan, which is divided into three main cities; Khartoum, Omdurman and Khartoum North.

Study population and sampling procedure

A sample-frame was the list of 930 community pharmacies in Khartoum state (Khartoum 383, Omdurman 332 and Khartoum North 215), obtained from the Directorate of Pharmacy, Ministry of Health, Khartoum. The list was stratified by location and a random sample of 190 community pharmacies was selected for the study; Khartoum 66, Omdurman 66 and Khartoum North 58. The sample size was determined with 90% confidence interval, using Epi-Info program. The Sampling procedure was conducted using a stratified, systematic random sampling. For the stratified sampling; the sample frame was arranged into three groups, according to the number of community pharmacies in each city, then the respective sample size was chosen from each group. The Systematic random sampling was carried out as follows.

Sample interval = total number of pharmacies in the group divided by number of pharmacies to be included in the sample e.g. in Khartoum city: 383/66 = 5.8. And a random number containing three digits was selected as 0.195. Then 5.8 X 0.195 = 1.13, this was rounded down to number 1 to represent the first number of pharmacy from the list to be chosen. The second chosen pharmacy = 1.13 + 5.8 = 6.93 = pharmacy No. 7. The third chosen pharmacy = 6.93 + 5.8 = 12.7 = pharmacy No. 13.

The randomization procedure was carried out to choose the remaining 66 pharmacies in Khartoum city. The same selection procedure was applied for the remaining pharmacies in Omdurman and Khartoum north.

Data Collection

The data was collected from the randomly selected community pharmacies in the three cities in Khartoum state, using a 3 sections questionnaire. Content and face validity of the questionnaire were established by comparison of the statements with the literature and the input received from a panel of three community pharmacists and academics of professional experience in the field. Wording, relevance and interpretation of the statements were discussed and clarity was assured. The questionnaire was preceded by an introductory letter, explaining the study and its purpose, for participants' cooperation. The total number of questions was 13. Both close and open ended questions were used. The demographics of community pharmacists working in the selected community pharmacies were documented. The awareness and willingness of community pharmacist towards screening services for prevention of CVDs risks were investigated using 6 and 3 questions, respectively. At the end of the questionnaire, pharmacists were invited to express comments regarding development of community pharmacy practice. A pilot study was then conducted on 10 community pharmacists to revise and finalize the questionnaire. Both self-administered and interviewing queries; to examine the questions and their coverage to the variables needed for the problems of the study, the sequence, understanding, and simplicity of the questions, were used. Many modifications were then performed. Data collected from the pilot study was analyzed using SPSS® (version 13) and a reliability coefficient (alpha) was determined. Participants from the pilot study were not included in the final sample. The researcher trained four pharmacists to collect data. They all distributed the questionnaires in person due to the unreliable postal system in the Sudan. In the first visit the questionnaire was given to the pharmacists in charge with verbal and written explanation of its aim. Pharmacists could either complete the questionnaire on site whilst the researcher waited or asked to return it within 4 weeks. They were reminded by weekly telephone calls, and the researchers returned to collect completed questionnaires at 2 and 4 weeks.

Data analysis

A coding frame for each response in the questionnaire was made and data were entered in Microsoft Excel®, checked for accuracy then loaded into SPSS® for descriptive statistics. The responses in each section were subjected to frequency analysis.

RESULTS

The questionnaire reliability was considered acceptable (α = 0.7 (95% confidence interval, 0.62–0.77)). A total of 190 questionnaires were distributed. One hundred and seventy-three completed questionnaires were returned, after one to three reminders, giving a response rate of 91%. The majority of participants aged 22-30 years with B. pharm and up to five years' practice experience (Table 1).

Table 1: Demographic characteristics of respondents (n=173).

Characteristics	Frequency (percent)
Gender	
Male	96 (55.5%)
Female	77 (44.5%)
Age (years)	
22-30	127 (73.4%)
31-40	31 (17.9%)
41-50	6 (3.5%)
>50	9 (5.2%)
Qualifications	
B. Pharm	170 (98.3)
Pharmacy diploma	3 (1.7)
M. pharm	0
Ph.D.	0
Practice experience (years)	
0-5	125 (72.3%)
6-10	33 (19.0%)
11-20	6 (3.5%)
21-30	3 (1.7%)
>30	6 (3.5%)

Participants were presented by four PC services, including screening services, to assess their awareness of the fact that CVDs risks screening is a part of PC services. Screening services were least recognized as part of PC services, while monitoring, counseling and referring received higher ratings (Fig. 1).

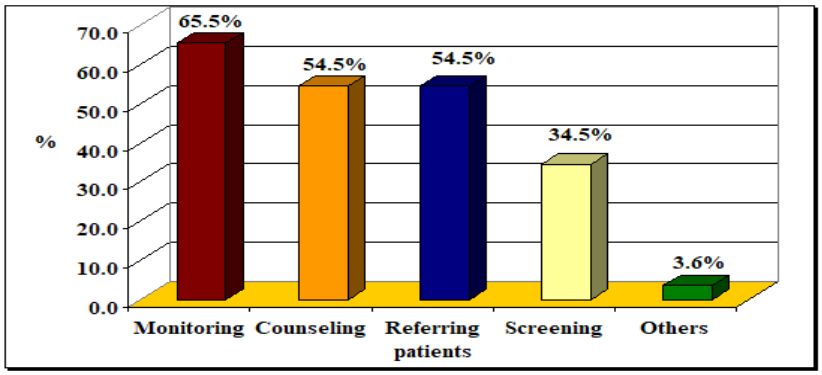

Figure 1: Respondents' awareness about screening services as part of pharmaceutical care services.

A 5 point Likert-type question investigated the views of community pharmacists about screening services, where 91% of the participants ensured their importance (Fig. 2).

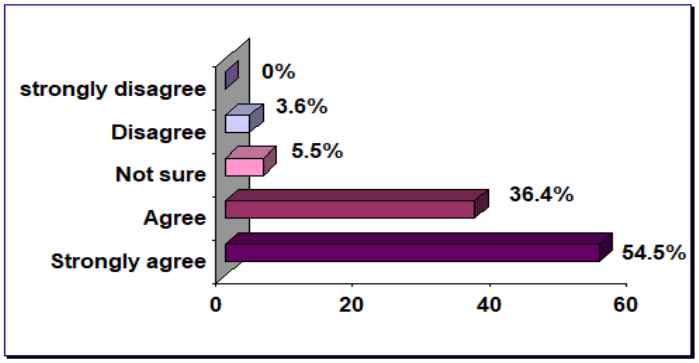

Figure 2: Perception about the importance of screening services.

The majority of respondents claimed that screening services are useful for prevention of complications and early detection of diseases and about one half claimed that they improve patient's quality of life (Fig. 3).

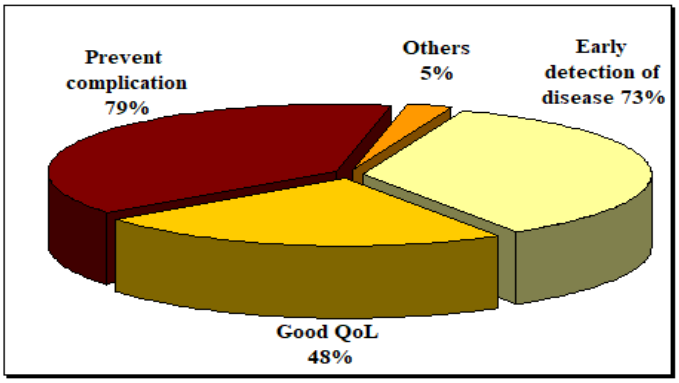

Figure 3: Participants' response to the expected needs for screening services.

In response to the target population for the screening services; 67% of the respondents' answered that these services are for symptomatic patients while 56% claimed they are offered for asymptomatic people and 14.5% didn't know.

Participants' awareness of diseases with risk of developing CVDs was variable; where hypertension and hyperlipidemia were highly rated compared to diabetes and hyperthyroidism (Fig. 4).

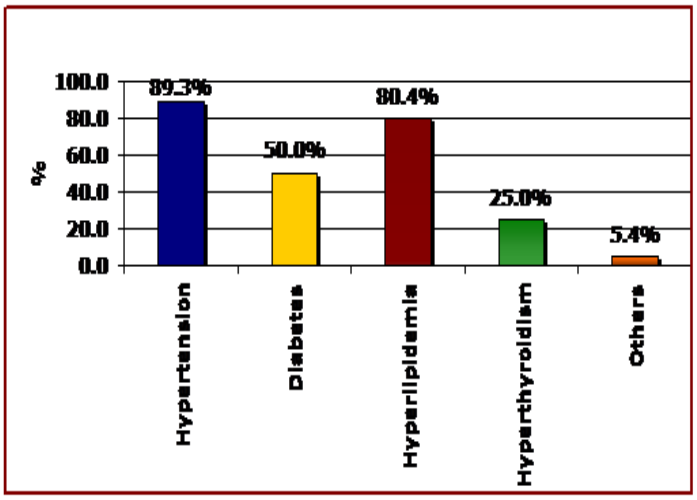

Figure 4: Awareness of diseases with risk of developing cardiovascular diseases.

The response of participants to the type of screening services that can be offered in community pharmacies highly concentrated on measuring blood pressure and blood glucose levels (Fig. 5).

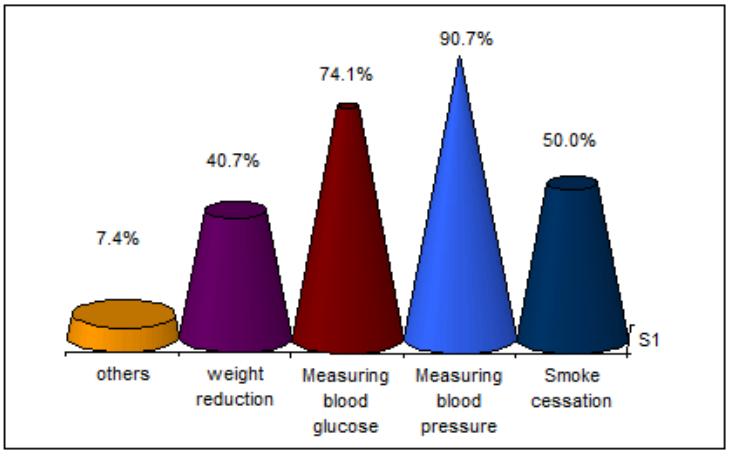

Figure 5: Awareness of selected screening services that can be offered by community pharmacists.

In a direct Yes/No question 78% of participants indicated their willingness for provision of screening services in their community pharmacies. Among those who are willing to perform screening services, the majority are keen to perform hypertension screening and blood glucose measurement (Fig. 6).

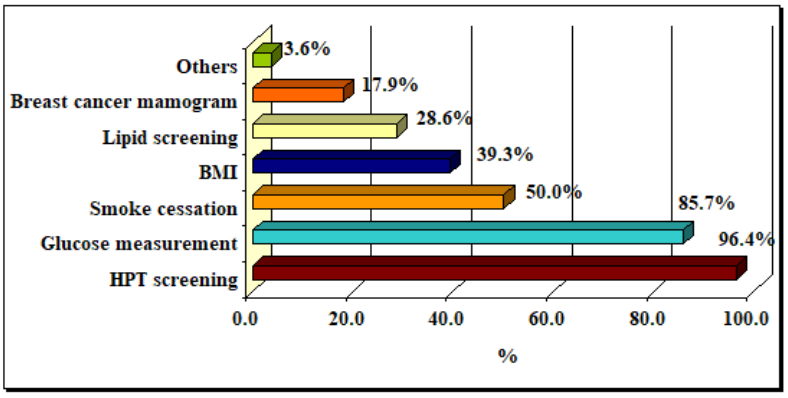

Figure 6: Types of screening services respondent are willing to perform.

Lack of knowledge and training were of high concern to participants as barriers that prevent them from performing screening services (Fig. 7).

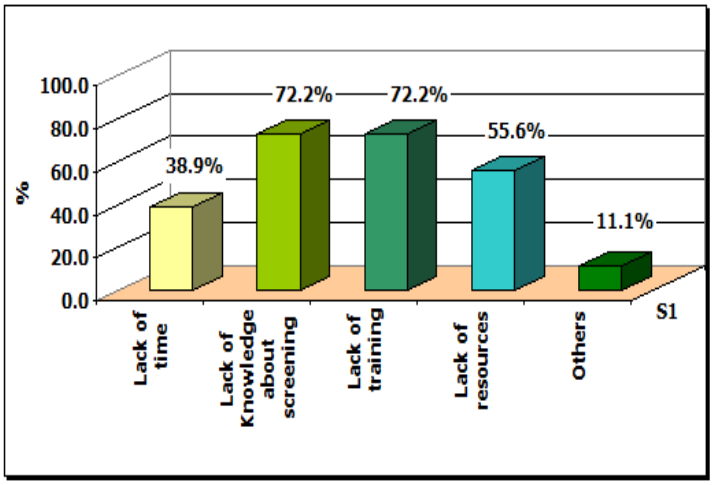

Figure 7: Barriers for implementing screening services.

Other barriers reported by participants can be summarized as: lack of customers' concern, interest and their refusal to such services, disapproval of pharmacy owners, the extensive burden of the service on the pharmacist and their contractual framework which does not include such services, in addition, neither the time, assistance, private areas nor incentives are available for them.

DISCUSSION

Community pharmacies are the largest sector where majority of pharmacy graduates practice. They are increasingly involved in PC services, including CVDs risk assessment, making greatest contribution to their communities. The present study investigated the current situation of screening services in the Sudan by assessing the awareness and attitude of Sudanese community pharmacists towards such services, particularly those focused on the prevention of CVDs. The study also identified barriers of providing these services.

Several studies investigated the situation of current pharmacy practice in the Sudan.[21,22] Community pharmacy practice in the Sudan is more limited to the traditional role of dispensing and medical advising with no recognition to the new roles and responsibilities of community pharmacists[23] In the present study, community pharmacists showed positive attitude and willingness towards the provision of CVDs screening services. However, their humble awareness and some barriers prevented them from effective implementation of the services.

An Australia study showed that younger pharmacists and pharmacies located in regional shopping centers were associated with a higher level of preventive services for CVD.[24] This is very relevant to the situation in the present study where the participants are mostly young, B. Pharm holders who can be easily engaged in the provision of these services. Evidence of the effectiveness of community pharmacists in rural areas was available.[25,26] In Sudan many community pharmacists work in rural areas where health care system is underdeveloped and the community pharmacist can be the only available health care provider. Therefore their training in screening services is of utmost importance.

The concept of screening services as one of the clinical skills and services of PC practice represented a small percentage in the current study indicating that community pharmacist's awareness of such services is poor. Pharmacists need to contribute effectively to the new patient-centered pharmacy practice. Accepting such responsibility is essential, however, they must have the opportunity to acquire the appropriate knowledge and skills required for this new role.[23,27] On the other hand, about 91% of participants showed high perception towards CVDs risks screening services as a professional practice and indicated their strong agreement with its importance. This high interest, willingness and acceptance can be capitalized on for the implementation of CVDs risks screening services in community pharmacies in the Sudan.

Participants reported early detection of diseases and prevention of complications as the two major components of screening services. This is a positive finding since screening services, as one of primary prevention methods must aim at identification of high risk people (CVD risk of > 20% over 10 years) and management of apparently healthy individuals at high total risk of developing CVDs.[28] In order to estimate total cardiovascular risk, it is essential to identify and treat individual risk factors, such as raised blood pressure and blood cholesterol levels, since there is a continuous relationship between these risk factors and cardiovascular risk. The majority of participants reported high response for both hypertension and hyperlipidemia as major risk factors for CVDs. This gives a good indicator for their awareness of some CVDs risks. However, there is a moderate to little knowledge about diabetes and a negative response towards hyperthyroidism, reflecting their poor knowledge of these risk factors. In response to the screening services that can be offered by community pharmacists, hypertension and diabetes received higher ratings compared to weight control and smoke cessation services. At least one-third of all disease burdens worldwide are caused by tobacco, alcohol, blood pressure, cholesterol and obesity. Furthermore, more than three-quarters of cardiovascular diseases result from tobacco use, high blood pressure, cholesterol, or their combinations.[29]

In the present study, diabetes was rated low as a risk factor for CVDs, but highly favored for screening. On the contrary, participants highly rated hyperlipidemia as a risk factor yet their willingness for lipid screening was low. This lack of uniformity in participants' responses suggests a degree of misperception and lack of appropriate awareness and formal education and training on this matter. Community pharmacists must not ignore that co-morbidity of CVDs occurs with diabetes and that diabetes remains as one of the most serious risks in the Sudan and should be focused on and screened.

It is evident that clinical skills required to practice PC include obtaining information from the patient, applying knowledge to individual patients, communicating with patients, and being reflective in practice[30] The lack of knowledge and training identified in this study were the main barriers for acquiring the essential clinical skills for screening. With appropriate knowledge and training at both undergraduate and postgraduate levels, community pharmacists can help in early identification of cardiovascular risks and upon improving their communication skills they can attract their customers and interact effectively with other health care providers and patients.

Lack of resources including funds, counseling areas, pharmacy facilities to accept more than one pharmacist in one shift, etc. represent vital barriers for service implementation. Currently available evidence suggests that community pharmacy-based screening services are unlikely to be successful unless they are part of a well-recognized, coordinated, fully funded activities.

Lack of time is a significant obstacle standing against the implementation of PC practice worldwide. However, it has been suggested that pharmacists could make more time if there was better delineation between the roles of the pharmacist and the pharmacy technician. If pharmacists were less involved in dispensing and preparation duties, this would "free-up" time for patient-focused care. Through re-organization of pharmacy staff duties, a certain amount of time could be routinely scheduled for patient care activities. A good money management may be required to hire more pharmacists particularly in heavily patients-loaded pharmacies. Community pharmacies in the Sudan are run by pharmacists and pharmacy assistants, there are no pharmacy technicians available, and therefore hiring of pharmacy technicians is highly needed for successful running of the service.

CVDs risk screening services need the development of a bond between the pharmacist and patient for providing high quality patient care. Effective Counseling, training programs, good quality control, documentation and record keeping are a critical part of screening services that cannot be compromised. It does not only promote identifying at risk patients but also helps to reduce the probability of the sudden death that develop as a consequence of asymptomatic CVDs. It also empowers the patient to take a more active role in the care process.

Study Limitations

- The geographical distribution of this study limits generalization of the findings.
- The questionnaire did not cover all the requirements for implementation of CVDs risk screening services e.g. quality control measures of the equipment used, assessment techniques and quality assurance aspects of the screening services.
- This study had no way of eliminating bias or verifying respondents' claims.

CONCLUSION

The awareness of screening services was fair and respondents showed high perception and willingness towards their implementation. However, these services are not officially recognized as part of the pharmacist responsibilities and do not represent one of the currently approved roles of Sudanese community pharmacists. Health authorities need to look into

accreditation and implementation of CVDs risk screening services especially for those who are likely to be at elevated risk. Education and training in clinical skills required to practice PC and continuing professional development courses with emphasis on health promotion and disease prevention are needed. There is an ongoing need to improve communication with general practitioners, and reinforce that these services are intended to assist in improving the nation's health and are not taking business away from them. A joint sustained collaboration between the Ministry of Health, the Pharmaceutical and Medical Associations and Academic institutions is essential to support and implement the change process, and help contain the national burden of CVDs.

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REFERENCES

1. Worldd Health Organization. Cardiovascular diseases (CVDs) fact sheet. 2015. doi:Fact sheet N°317.
2. Ministry of Health, Directorate of Pharmacy Annual Report, Khartoum State, 2015.
3. Roughead L Semple S and Vitry A. The value of Pharmacist Professional Services in the community setting. 2003. http://www.researchgate.net/publication/239595198%0A.
4. Anderson S. Community pharmacy and public health in Great Britain, 1936 to 2006: how a phoenix rose from the ashes. *J Epidemiol community Heal*, 2007; 61(10): 844-848.
5. George PP, Molina JAD, Chean J, et al. The evolving role of the community pharmacist in chronic disease management - A literature review. *Ann Acad Med Singapore*, 2010; 39(11): 861-867.
6. Eades CE, Ferguson JS, O'Carroll RE. Public health in community pharmacy: A systematic review of pharmacist and consumer views. *BMC Public Health*, 2011; 11(1): 582.
7. Chiazor I, Evans E, van Woerden M, et al. A systematic review of community pharmacists' interventions in reducing major risk factors for cardiovascular disease. *Value Heal Reg Issues*, 2015; 7: 9-21.

8. Sabater-Hernández D, Sabater-Galindo M, Fernandez-Llimos F, et al. A Systematic Review of Evidence-Based Community Pharmacy Services Aimed at the Prevention of Cardiovascular Disease. *J Manag Care Spec Pharm*, 2016; 22(6): 699-713.
9. Tsuyuk RT, Johson JA, Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the study of cardiovascular risk intervention by pharmacists (SCRIP) FREE. *Arch Intern Med*, 2002; 162(10): 1149-1155.
10. Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in project ImPACT: hyperlipidemia. *J Am Pharm Assoc*, 2000; 40(2): 157-165.
11. Snella KA, Canales AE, Irons BK, et al. Pharmacy- and community-based screenings for diabetes and cardiovascular conditions in high-risk individuals. *J Am Pharm Assoc*, 2006; 46(3): 370-377.
12. Willis A, Rivers P, Gray LJ, Davies M, Khunti K. The effectiveness of screening for diabetes and cardiovascular disease risk factors in a community pharmacy setting. *PLoS One*, 2014; 9(4): 1-9.
13. Mckenney JM, Slining JM, Henderson HR, et al. The effect of clinical pharmacy services on patients with essential hypertension. *Circulation*, 1973; 48(5): 1104-1111.
14. Mangum SA, Kraenow KR, Narducci WA. Identifying at-risk patients through community pharmacy-based hypertension and stroke prevention screening projects. *J Am Pharm Assoc*, 2003; 43(1): 50-55.
15. Bunting BA, Smith BH, Sutherland SE. The Asheville Project: Clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia. *J Am Pharm Assoc*, 2008; 48(1): 23-31.
16. Landon BE, Hicks LS, O'Malley AJ, et al. Improving the management of chronic disease at community health centers. *N Engl J Med*, 2007; 356(9): 921-934.
17. Kaczorowski J, Chambers LW, Dolovich L, et al. Improving cardiovascular health at population level: 39 Community cluster randomisedtrial of Cardiovascular Health Awareness Program (CHAP). *Bmj*, 2011; 342(7794): 422.
18. Tsuyuki RT, Al Hamarneh YN, Jones CA, Hemmelgarn BR. The effectiveness of pharmacist interventions on cardiovascular risk: The multicenter randomized controlled RxEACH Trial. *J Am Coll Cardiol*, 2016; 67(24): 2846-2854.
19. Horgan JMP, Blenkinsopp A, McManus RJ. Evaluation of a cardiovascular disease opportunistic risk assessment pilot ("Heart MOT" service) in community pharmacies. *J Public Health*, 2010; 32(1): 110-116.
20. Ministry of Health, General Directorate of Pharmacy, Sudan. The Pharmaceutical

Strategy for 25 Years (2004 - 2029).

21. Mohamed SS, Mahmoud AA, Ali AA. Involvement of Sudanese community pharmacists in public health activities. *Int J Clin Pharm*, 2013; 35(3): 393-400.
22. Mohamed SS, Mahmoud AA, Ali AA. The role of Sudanese community pharmacists in patients' self-care. *Int J Clin Pharm*, 2014; 36(2): 412-419.
23. Mohamed SS, Mahmoud AA, Ali AA. Sudanese community pharmacy practice and its readiness for change to patient care. *Int J Pharm Pract*, 2015; 23(4): 266-273.
24. Joyce A, Bhamerbatis CG, Sunderland VB, Dhaliwal SS. Analysis of primary prevention services for cardiovascular disease in Australia's community pharmacies, *Aust N Z J Public Health*. 2007; 31(6): 516-519.
25. Hourihan F, Krass I, Chen T. Rural community pharmacy: A feasible site for a health promotion and screening service for cardiovascular risk factors. *Aust J Rural Health*, 2003; 11(1): 28-35.
26. Adje UD, Oparah CA, Williams FE and Akpovwovwo E. Outcomes of community pharmacist' cardiovascular risk intervention among high risk rural dwellers. *IJPSR*, 2017; 8(12): 5353-5359.
27. Wiedenmayer K, Summers RS, Mackie CA, et al. Developing pharmacy practice - A focus on patient care. *World Heal Organ Int Pharm Fed*, 2006; 87. http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Developing+pharmacy+practice+A+focus+on+patient+care#3. Accessed November 14, 2011.
28. Wood D, Wray R, Poulter N, et al. JBS 2: Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice. *Heart*, 2005; 91(SUPPL. 5).
29. Prevention of cardiovascular disease Pocket Guidelines for Assessment and Management of Cardiovascular Risk. World Health Organization, WHO Press, Geneva, 2012; 36. http://www.who.int/cardiovascular_diseases/publications/Prevention_of_Cardiovascular_Disease/en/.
30. Cippole RJ, Strand LM and, Morley PC. Pharmaceutical Care Practice: The Clinician's Guide. 2nd ed. McGraw-Hill, 2007.