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ROLE OF COMMUNITY PHARMACIST IN HEALTH SCREENING SERVICES -A REVIEW

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ABSTRACT

The role of health screening in Community Pharmacies is not to take over the role of the GP. Screening in Community Pharmacies on the whole is designed to provide access to screening services to the members of the public, who may not be able to access this intervention through their GP. In Australia as noted by pharmacists who were involved in health screening in pharmacies, screening was very useful. But it was the combination of extensive counselling (regarding diet and life style modification) and screening which dramatically increased patient satisfaction and improved health outcomes. Cardiovascular diseases caused 2.3 million deaths in India in the year 1990, and this is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. ***Results****: Majedski et al community screening findings reflected that out of 539 patients screened, 78% had abnormal cholesterol levels, 81% requested dietary information and when followed up 83% of patients reported that they had made dietary modification[3]. Naunton and Peterson conducted an evaluation of trained pharmacist, who conducted ultrasound Bone Mineral Density (BMD) screening and education in community pharmacies in rural Australia. The pharmacist screened 345 subjects (women aged >65 years), 20% were classified as likely osteoperotic and 46% were likely to undergo risk for osteoporosis.* ***Conclusion:*** *In a study by Cordina et al more than 85% of consumers were in favour of screening and monitoring services in Community Pharmacies. Naunton et al concluded that there is certainly scope for further researches on the role of pharmacists in educating patients on the prevention and treatment of osteoporosis.*

KEY WORDS

Screening, Monitoring.

PURPOSE OF HEALTH SCREENING

The role of health screening in Community Pharmacies is not to take over the role of the GP. Screening in Community Pharmacies on the whole is designed to provide access to screening services to the members of the public, who may not be able to access this intervention through their GP[2].

The American college of Physicians recently stated pharmacists scope of practice is expanding and the medical community must proactively respond to the pharmacy movement by partnering collaboratively with pharmacists, physicians will be able to concentrate and focus on their primary mission- high quality patient care[3].

One study found that GP's have a little or no concern regarding pharmacist knowledge, skills and capabilities to engage in enhanced pharmacy services. However, the concern arises about the context or setting in which they are working. One of the central issues identified by the GP's is the perception of the commercially focused environment of Community Pharmacy. However, the study by Hassell et al observed Community Pharmacists make references and give advice even when such intervention did not involve making a sale[3].

Is screening in community different from screening elsewhere?

Community pharmacists have access to people who are apparently healthy and who rarely come into

contact with GP's or nurses. An increasing proportion of pharmacists provide a blood pressure and blood cholesterol and glucose screening / monitoring services. In Australia as noted by pharmacists who were involved in health screening in pharmacies, screening was very useful. But it was the combination of extensive counselling (regarding diet and life style modification) and screening which dramatically increased patient satisfaction and improved health outcomes. In a study by Cordina et al more than 85% of consumers were in favour of screening and monitoring services in Community Pharmacies[3].

Community screening findings

Majedski et al conducted a study about feasibility of Community Pharmacy participation in cholesterol screening. They advertised about the cholesterol screening in the local newspaper and at the pharmacy. Of 539 patients screened, 78% had abnormal cholesterol levels, 81% requested dietary information and when followed up 83% of patients reported that they had made dietary modification[3].

HYPERTENSION

Hypertension (high blood pressure) is not a disease but an important risk factor for cardiovascular complications. It can be defined as a condition where blood pressure is elevated to an extent where clinical benefit is obtained from blood pressure lowering. Blood pressure measurement includes systolic and diastolic components, and both are important in determining an individual's cardiovascular risk[4].

A study in the UK, one Community Pharmacy provided blood pressure (BP) measurement service. It targeted patients in the age group of 30-64 years. 58% of the 120 people invited accepted the offer and copy of the BP reading was given to the patient to take to their doctor. When the GP's records were checked only 25% of records contained the pharmacy reading. The authors concluded that BP screening by pharmacists should be a part of programme coordinated with the patients, physician and pharmacists should use the results of screening and risk assessment tests to advice the patients about diet, exercise, weight management, smoking cessation and other life style issues[3].

Hypertension Screening

Table.1:7th JOINT NATIONAL COMMITTEE (JNC) Report classification of BP[5]

Category	Systolic (mm of Hg)	Diastolic (mm of Hg)	Life style modification	Drug therapy indication
Normal	< 120	< 80	Encourage	No
Pre HTN	120-139	80-89	Yes	No
Stage I HTN	140-159	90-99	Yes	Yes
Stage II HTN	> 160	> 100	Yes	Yes

Prevalence of Hypertension in India

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990, and this is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.

Hypertension prevalence is lower in the rural Indian population, recent studies using revised criteria (SBP>140mm of Hg and DBP >90mm of Hg) have shown high prevalence of hypertension among urban adults, men 31%, women 36% in Thiruvanthapuram (2000).

Acoording to an estimate, there are 31.5million hypertensives in rural and 34 million in urban populations. A total of 70% of these would be stage-1 hypertension (systolic BP 140-159 and DBP 90-99mm of Hg). Recent reports reflect that borderline hypertension (SBP 130-139mm of Hg and DBP 80-89mm of Hg) carries a significant cardiovascular risk and there is a need to reduce blood pressure[6].

Importance of Screening for Hypertension

National Heart Lung and Blood Institute (NHLBI) say that a blood pressure level of 140/90mmof Hg or higher is considered high. About two thirds of people over the age of 65 years have high blood pressure.

Patients with blood pressure between 120/80 mm of Hg and 139/89 mm of Hg are said to be pre-hypertensive. This means that they do not have high blood pressure now but are likely to develop it in the future. This group of patients can take steps to prevent high blood pressure by adopting a healthy lifestyle.

Those who do not have high blood pressure at the age 55 years face a 90 % chance of developing it during their lifetimes, according to NHLBI. Hence, high B.P is a condition that most people are likely to develop at some point in their lives.

Although high blood pressure (also called hypertension) may not produce any symptoms, it still causes damage, which is why it's often called the "silent killer". Left untreated, high blood pressure can damage a patient's blood vessels, as well as internal organs such as heart or kidneys. Having high blood pressure also means that patients are at a higher risk of developing heart disease or having a stroke[7]. Therefore screening decreases morbidity and mortality associated with untreated hypertension by identifying patients with hypertension in the early stages of their disease.

Accuracy of screening tests for hypertension

The most accurate routine screening for measuring the blood pressure depends upon the following factors such as invasiveness, technical limitations and cost. The office sphygmomanometer (BP Cuff) remains the most appropriate screening method for hypertension in the asymptomatic population. Although this test is highly accurate when performed correctly, false positive and false negative results (recording BP that is not representative of the patient's average BP) do occur in the clinical practice. One study found that, 21% of the persons diagnosed as mildly hypertensive based on office sphygmomanometer, had a no evidence of hypertension when 24 hrs ambulatory recordings were obtained.

Errors in measuring the BP may occur due to instrument, observer and patient factors. E.g. of instrument error includes manometer dysfunction, pressure leak, stethoscope defects and cuffs of incorrect width or length for the patients arm size. The observer can introduce errors due to the sensory impairment, inattention and inconsistency in recording Korotkoff sounds (E.g.: Phase 4 vs phase 5).

The patient can be the source of misleading readings due to posture variation during measurement and biological factors. Posture (i.e. lying, standing, and sitting) and arm position in relation to the heart can affect results by as much as 10 mm of Hg.

Biological factors include anxiety, meals, tobacco, alcohol, temperature changes, exertion and pain. Due to these limitations in the test- retest reliability of BP measurement, it is recommended that hypertension be diagnosed only after more than one elevated reading is obtained on each of three separate visits over a period of one to several weeks[8].

Potential Advantages and Disadvantages of Public Blood Pressure Monitoring

- Increased screening for hypertension in persons without the resources to own a blood pressure monitor or to see their physician frequently.
- Increased patient involvement in hypertension care and enhanced adherence to therapy[9].

Disadvantages

- No validated public blood pressure measurement devices.
- Cuff size of current devices is too small for more than one half of hypertensive patients.
- No established values for normal and abnormal blood pressures taken in public places.
- Lack of reliable mechanisms of referral to medical care for persons whose blood pressure is elevated [9].

DIABETES MELLITUS

Diabetes mellitus is a term that describes a series of complex and chronic metabolic disorders characterized by symptomatic glucose intolerance[10]. Type 2 diabetes mellitus is a group of metabolic disorder characterized by high levels of blood sugar (hyperglycemia) resulting from defects in the secretion or action of insulin[11]

Criteria for diagnosing Diabetes Mellitus (WHO-1999)

The criterions that are listed below reflect research evidence on the prevention of diabetes related complications.

1. Diabetes symptoms (that is polyuria, polydipsia, polyphagia and unexplained weight loss) along with
    - Random venous plasma glucose concentration > 11.1 m mol/ltr.
    - Or a fasting plasma glucose concentration > 7 m mol/ltr (whole blood > 6.1 m mol/ltr).
    - Or plasma glucose concentration > 11.1 m mol/ltr two hours after 75 gm anhydrous glucose in an oral glucose tolerance test (OGTT).
2. If the patient has no symptoms, diagnosis should not be based on single glucose determination but confirmatory venous plasma glucose must be done.
3. At least one additional glucose test result, on another day with the value in the diabetic range, is essential, either from fasting or from a random sample or from the two-hour post glucose load. If the fasting or random values are not diagnostic, the two-hour value should be used[4].

Chronic hyperglycemia can result in blindness, kidney failure, amputations, heart disease, stroke, pregnancy complication, and premature death. Diabetes is a leading cause of death and disability in United States. At least 6% of the general population in the U.S i.e nearly 16 million people-are estimated to have diagnosed and undiagnosed diabetes. The complications can precipitate before the clinical symptoms are evident. The early detection and aggressive clinical and self-management can reduce excessive blood sugar there by preventing and ameliorating these complications[11]

Prevalence of diabetes in India

The recent WHO report suggests that over 19% of the world diabetic population currently resides in India. This translates to over 35 million diabetic subjects and these numbers are projected to increase to nearly 80 million by 2030.This rising trend predicts significant health burden due to diabetes in India.

Around 150 million people suffer from diabetes, out of which above 35 million are Indians, the highest number in any country. Every fifth person who suffers from diabetes in the world today is an Indian. Recent studies reflect that upto 10% of India's urban population and 2% of the rural population above the age of 15 years have diabetes. This number seems to be increasing rapidly. By 2030, India will have 79.4 million diabetics, projects the World Health Organization (WHO).

There are more diabetes cases in urban areas than in rural probably because of the fast food culture and less physical activity. A national urban diabetes survey was conducted in 2000 by an group of Indian doctors which reflect the following statistics- topping the list is Hyderabad (16.6%), followed by Chennai (13.5%) and Bangalore (12.4%). The incidence of diabetes in most metros and cities of India presently is 10-15%. About one-sixth of the total worldwide deaths due to this disorder are in India and the maximum in any single country.

Unfortunately more than 50% of the diabetic subjects in India remain unaware of their diabetic status, which adds to the disease burden, this underscores the need for mass awareness and screening programmes to identify and overcome the burden due to diabetes in India[12].

Monitoring

Community pharmacists should have a fundamental understanding of the processes involved in the accurate operation of glucose monitoring instruments and an understanding of the disease and its treatment.

All people with diabetes symptoms such as polyuria, polydipsia, and polyphagia, slow healing of the wounds, blurred vision, Urinary Tract Infection (UTI) etc and asymptomatic persons with one or more risk factors listed should be given first importance for the screening of diabetic patients. Risk factors for diabetes includes family history of type 2 DM, obesity (BMI>30), gestational diabetes, sedentary life style, smoking, alcoholics, hyperlipidemia, age >40 years[13].

Table.2: Recommendations for Diabetes Screening Of Asymptomatic Persons[13]

Test individuals 45 years of age or older; repeat every 3 years.
Test before age 45and repeat more frequently if patient has one or more of the following risk factors:
Obesity (120% over desirable body weight or BMI>27kg/m^2)
First-degree relative with diabetes mellitus.
Member of high-risk ethnic group (black, Hispanic, Native American, Asian).
Hypertensive (>140/90 mm of Hg).
HDL cholesterol level <35 gm/dl or triglyceride >250 mg/dl.

Anemia

WHO defines anemia in adults as hemoglobin level less than 13 g/dl for males and less than 12 gm/dL for females. Major causes of Iron deficiency anemia include inadequate iron absorption, dietary deficiency, malabsorption, increased physiological demand and loss through bleeding. Anemia can be classified by size and color of red blood cells which includes 1) Hypochromic microcytic anemia. Eg: iron deficiency, sideroblastic, thalassaemia 2) Normochromic macrocytic anemia. Eg: folate deficiency and vitamin B12 deficiency 3) Poly chromatophillic macrocytic anemia e.g due to haemolysis.

Non-specific signs and symptoms of anemia include tiredness, pallor, fainting, exertion dyspnoea, tachycardia, palpitations, worsening angina and worsening cardiac failure. The clinical features of iron deficiency anemia include pale skin and mucus membranes, painless glossitis, angular stomatitis, dysphagia and atrophic gastrititis[4].

Table 3: Typical daily requirements of Iron[4]

Infant (0-4 months)	0.5 mg
Adolescent male	1.8 mg
Adolescent female	2.4 mg
Adult male	0.9 mg
Menstruating Adult female	2.0 mg
Pregnant female	3-5 mg
Post menopausal female	0.9 mg

Screening for Anemia

Anemia may be due to a variety of underlying conditions. Iron deficiency is an important cause among young children and women of reproductive age in the U.S. The prevalence of iron deficiency anemia in children of U.S has declined in recent years and in 1993 it was estimated to be at or below 3% for children aged between 4 - 12 years. The exact prevalence of iron deficiency anemia among pregnant women is uncertain, but national data suggest that < 2% of nonpregnant women aged 20-44 years have iron deficiency anemia.

As early as the 1960s, researchers demonstrated that, in general, decreased hemoglobin alone does not have readily apparent adverse effects unless it is below 10g/dl. Persons with markedly reduced hemoglobin levels are at risk for cardiopulmonary and other complications[14].

The hemoglobin concentration and hematocrit is the principal screening tests for detecting anemia. The WHO hemoglobin cut off points for diagnosing anemia in adults has been widely adopted:

- Men <13g/dl
- Menstruating women <12g/dl
- Pregnant women-11g/dl.

Effectiveness of Early Detection

Evidence is limited that in the asymptomatic general adolescent or adult U.S population, early detection and treatment significantly reduces morbidity from anemia, iron deficiency or the conditions that cause them. This evidence is further limited by the fact that

studies often use inconsistent or vague definitions of anemia and iron deficiency[14].

Early detection and treatment of iron deficiency anemia in pregnancy has been assumed to be beneficial because, moderate to severe anemia (i.e.<9.0-10.0g/dl) has been associated with a 2-3 fold increased risk of low birth weight, preterm delivery and prenatal mortality in numerous cross-sectional and longitudinal observational studies in industrialized countries. The consistency of these results across different study designs and population samples is noteworthy, although such studies do not conclusively prove that anemia directly influences pregnancy outcomes[14].

OBESITY

Obesity is a condition in which a weight gain has reached the point of seriously endangering the health. While some people are more genetically susceptible than others, the direct cause of obesity in any individual is always an excess of energy intake over energy expenditure[15].

According to the National Heart, Lung and Blood Institute (NHLBI) assessment of overweight, uses three measures i.e. body mass index (BMI), waist circumference and risk factors for diseases associated with being overweight. BMI is calculated as follows:

BMI = Weight in kilograms / (height in mts) ^{2}

Men with waist sizes over 40 inches and women with waist sizes over 35 inches are considered to have excess body fat. Other risk factors that increase the risk of developing the diseases associated with being overweight include hypertension, decrease in good lipoprotein (low HDL) and increase in bad lipoprotein (high LDL), high triglycerides, high blood sugar, family history of premature heart disease, physical inactivity and cigarette smoking[15].

The communicable disease control (CDC) of Britain states that all adults who have BMI of 25 or more are considered at risk for premature death and disability as a consequence of overweight and obesity. Chances of developing hypertension and diabetes increase when the severity of an individual's obesity increases[15].

Weight gain in adult life especially seems to be an important risk factor for the developing hypertension. Weight loss has been recommended for the obese hypertensive patients and has been shown to be the most effective non-pharmacological treatment[15].

Table 4: Classification of obesity[15]

BMI (Kg/m^2)	Classification	Risk of disease associated with excess weight
< 20	Under weight	Low (but increased risk of other clinical problems)
20- 25	Desirable of healthy range	Average
25-30	Over weight	Increased
30-35	Obese Class I	Moderate
35-40	Obese Class II	Severe
> 40	Morbidly or severely Obese Class III	Very severe

Healthy eating habits help to maintain normal blood pressure, desirable blood cholesterols and a healthy body weight. In America, 61% of adults are overweight or obese, leading to health problems like hypertension, diabetes, stroke, gall bladder disease, arthritis, sleep apnea, breathing problems, and cancer of breast, prostate, colon and uterus[15].

Screening For Diseases Other Than Hypertension, Diabetes Mellitus and Anemia

Cerulli and co-workers evaluated the impact and feasibility of another community pharmacy –based BMD screening and education program. Of 140 women screened (aged >18 years) 82% indicated the screening was very useful and 91% believed it encouraged them to talk with their doctor about osteoporosis. Ten percent of screened patients were classified at high risk for osteoporosis. Importantly at 3 months after screening, 11% had increased their exercise levels and 30% had increased their calcium and vitamin D intake[3].

Naunton and Peterson conducted an evaluation of trained pharmacist, who conducted ultrasound Bone

Mineral Density (BMD) screening and education in community pharmacies in rural Australia. The pharmacist screened 345 subjects (women aged >65 years), 20% were classified as likely osteoperotic and 46% were likely to undergo risk for osteoporosis [3].

The researchers found that two-thirds of subjects had discussed the results with their GP and 11% had undergone further evaluation. Importantly, they noted that one-third of screened individuals commenced medication following the screening and two-thirds reportedly made lifestyle changes[3].

Naunton et al concluded that there is certainly scope for further researches on the role of pharmacists in educating patients on the prevention and treatment of osteoporosis[3].

References:

1. Dr.B.G. Nagavi, Dr. G Parthasarathy, Mr. M. Ramesh, Mr. A. Ramesh, B.S. Satvik, B.J. Mahendra Kumar. Training on Pharmaceutical care and Patient Counseling for practicing Pharmacists; 2002: 30
2. Shane Jackson and Professor Gregory Peterson. Health screening in community Pharmacy. Australian Pharmacist. 2004; 23:761-763.
3. Roger Walker and Clive Edwards. Clinical Pharmacy and Therapeutics. 3rd Ed, London. Churchill Livingstone; 2003:265,657-659,725-728.
4. US Department of Health and Human Services. Seventh report of the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure (JNC 7); 2003:2561.
5. Gupta R. Trends in Hypertension Epidemiology in India. Journal of Human Hypertension. 2004; 18 (2): 73-8.
6. http://www.stayinginshape.com/3osfcorp/libv/h03.shtml accessed on 12th Jan 2006
7. www.ahrq.gov/clinic/2ndcps/hyperten.pdf accessed on 12th Jan 2006
8. John W Graves. Blood Pressure Measurement in Public Places. American Family Physician. 2005; 71(5): 1-4
9. J.T.Dipiro, R.C.Talbert, G.C.yee, G.R.Matzke, B.G.Wells, L.M.Rosey; Pharmacology A Pathophysiologic Approach. Second edition. United States of America: McGraw Hill; 1992:1121.
10. Andrea Botomino, Bottmingen. Diabetes Screening and Health Promotion- Evaluation of a Pharmacy Based Campaign and of Related Activities.
11. Basel 2005; 72:6-39
12. Dr. Neelam Makol and Dr. A.M. Elizabeth. Diabetes The silent killer disease. Health Action.2005; 4.
13. Noel Dixon. Monitoring and Screening for Diabetes. Primary Care Pharmacy. 2001; 2: 17-18.
14. URL:http://cpmcnet.columbia.edu/texts/gcps/gcps0032.html accessed on 12th Jan 2006.
15. Department of health. Tackling Obesity in England. Report by the Comptroller and Auditor General. London: The Stationary Office; 2001:18-45.

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