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Self Medication, Drug Dependency and Self-Managed Health Care – A Review

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1. Introduction

Craving for medicine and self medication has been part of mankind from one generation to another. People generally hold the view that medicines should be used in the event of any sickness or discomfort¹. Consumers are being called upon to assume more responsibility for their health promotion and disease prevention practices. This challenge has motivated them to embrace the concept of self medication.

It is a common knowledge that there are not enough Doctors and Pharmacists in Africa and other developing countries to direct and guide everyone who become ill on the correct use of medications. Drug manufacturers have not helped matters as their chief concern is to promote the sale of their medicines without giving adequate information to the public on such drug if possible in the local language. This is compounded by high illiteracy level, poverty and inadequate health facilities and personnel. Self medication offers a way out as people begin to sense the positive benefits of multiplying their options in health care. In the developed countries with sufficient health manpower, many people still buy non-dangerous medications without a doctor's prescription^{2,3}. These are the over-the-counter (OTC) drugs whose sales statistics reflect the pattern of self medication⁴.

Studies in Britain and United States show that on the average 50-75% of health care takes place within the realm of self medication^{5,6}. This practice cuts across culture, gender, health and social status, race, occupation or any other sociodemographic or sociomedical state.

A cost benefit study in the UK concluded that availability of OTC drugs to the public results in saving the General Practitioner's time besides other benefits to the consumer since he /she can attend to other matters at the same time⁷. The total health expenditure within a country's gross domestic product (GDP) strains the public purse to which increasing demand is made. One potential means of reducing this pressure within the health budget is a greater reliance on self health care. Self care users may visit the physician less often and stay fewer days in the hospital resulting in lower expenditure for the hospital and Physician services⁸.

Self medication is however of public health concern because of the problem of drug misuse and abuse and its attendant medical (drug resistance and hypersensitivity), social (juvenile delinquency) and psychological (addiction and physical dependence) problems. In addition,

lack of knowledge of possible side effects of self-administered medication and possibility of selling potentially dangerous drugs as over-the-counter in developing countries could have a deleterious effect on the general health of the public.

This paper attempts to review existing information in the literature on the scope and distribution of self medication, its relationship with drug dependency and possible factors which might affect it. Recommendations are made on how self-medication can be effectively utilized in self managed health care.

2. Historical perspective

Man has used drugs for various purposes from the dawn of history. Herbal and other plant derived remedies have been estimated by the World Health Organization (WHO) to be the most frequently used therapies worldwide. Plant-derived remedies can contain chemicals with potent pharmacologic and toxicologic properties⁹. From the ancient civilization of South America came cocaine obtained from the leaves of *Erythroxylon coca* which was chewed for pleasure and reduction of fatigue. Extracts of cacti and mushroom species, used for religious purposes among Central and North American Indians can be used as an hallucinogenic agent. In Africa, eserine, a component of miotic eyedrops develops from Calabar beans used in fetish practices. Bronchiodilatory effects of ephedra develops from ephedra plants species in ancient China while digitalis, a potent heart stimulant was developed from purple foxglove, an ingredient of herbal folk medicine in England¹⁰.

Self medication had also been derived from other sources outside plants. In the southern United States of America, certain foods are used to reduce the excess volume of 'blood' which was believed to cause the illnesses; in Latin America, certain foods are used to counteract 'hot' or 'cold' illness and to restore the body equilibrium¹¹; in the majority of Xhosa speaking women of South Africa, indigenous healing practices are used for themselves and their babies because of the need to 'strengthen' the womb against sorcery, prevent childhood illness and to treat symptoms they perceive biomedical services would not be able to treat¹².

3. Scope and distribution

The concept of self medication, encouraging an individual to look after minor ailments with simple but effective remedies, has been adopted the world over. People hold the view that medicines should be used in the event of any sickness or discomfort¹². In the United Kingdom, the government encourages self reliance while agencies like WHO promote individual family and community participation in primary health care¹³. Poor diagnostic ability compounded by a limited knowledge of appropriate management results in the increase of self medication and low rate of health care utilization¹⁴. People are more likely to seek care from Physicians for symptoms that are serious since it was perceived that Doctors do not have time for trivial complaints¹⁵. Hence, whenever they perceive a symptom as minor, self medication was usually used for treating themselves¹⁶. A survey conducted in Poland revealed that self medication, while widespread, does not imply a negative attitude towards health professionals or the existing system of medical care¹⁷. On the contrary, people began to sense the positive benefits of self care among which is its apparent

contribution toward improvement of the efficiency of the over all health care system of themselves¹⁸.

The basic knowledge about the proper way of dealing with drugs and potential dangers of self medication is both insufficient and under estimated. This can be seen from earlier¹⁹ and later²⁰ studies conducted in Switzerland and Nigeria respectively which revealed that nearly one third of the population lacked sufficient drug knowledge. Lam and co-workers also showed that lack of knowledge was common with its side effects²¹.

In spite of the above shortcomings in knowledge, individual attitude to self medication has not diminished as can be seen from various studies conducted worldwide which revealed prevalence which range from 60-90%^{22,23}. For instance, Afolabi in a study of market women in a suburban community of Lagos, Nigeria reported 95-98%²⁴; Omolase et al established that 79% of ophthalmic patients²⁵ and 85% of patients in the general out patients clinic²⁶ in Owo, Nigeria admitted self-medication and Servidoni et al in an Ear, Nose and Throat clinic in Brazil reported 83%²⁷. Bamgboye et al, in a study of workers in a tertiary hospital in Nigeria reported a prevalence of 73%²³, Onajole et al²⁸ established in Lagos, Nigeria that 71% of their respondents admitted to drug misuse, Agbor and his co-worker²⁹ reported 67.8% prevalence for oral health problems in Cameroun while three studies of different population groups in Sudan reported that 81.8%³⁰, 79.5%³¹ and 73.9%²² respectively engaged in self medication without prescription or medical advice. However, other studies revealed a much lower prevalence for self-medication. For instance, it was 22% in a population-based study in Czechoslovakia³², 42% among dental outpatients in Nigeria³³, 32.5% in a study among Hong Kong Chinese population²¹, 27.5% in a study conducted among Ethiopian populations³⁴, 22% among ophthalmic patients in Ibadan, Nigeria³⁵ and 31% of ear, nose and throat outpatients in Nigeria³⁶. The extreme variation in figures might be due to the composition of the sample population, survey location and methods²².

Majority of those who self medicated reported improvement of their symptoms and this could have accounted for the delay in presentation at the clinic/hospital^{22,23}. This was confirmed by a Nigerian study of infants with acute respiratory tract infection which revealed that 32% had been treated with cough medicines, 42% with antipyretics, 5% with antibiotics and 10% with haematinics before they were brought to the clinic³⁷.

For chronic health problems, people device strategies of self care over months and years and apply them during flare-ups³⁸. For instance, a study of asthmatics showed that while 80% of sufferers tended to reduce doses following improvement, 48% of these bought their drugs without prescription for prophylaxis and in case of flare-ups³⁹. Among migraine sufferers, 42% self-treated themselves instead of consulting Physicians as most sufferers have learned to live with their condition⁴⁰. This was further confirmed in a study of Canadian migraine sufferers where about 90% used OTC drugs to self-treat their ailments whenever they had an attack⁴¹.

Pharmaceuticals can be bought without a Doctor's prescription for self-treatment in most pharmaceutical shops in developing countries. It was 51% of drug sales in an Ecuadorian study⁴², 66.3% from a study in the Phillipines⁴³ and 80% of drug purchases in a study across the U.S-Mexico border³. In countries where drug purchase is regulated like Portugal, a reduced prevalence of 26.2% was reported⁴⁴. This emphasizes the importance of careful drug history for General Practitioners and Physicians so as to be aware of what patients are

taking before treatment commence especially where subtherapeutic doses are involved. For instance, Bosch and co-workers reported self medication with subtherapeutic doses of the analgesics, aspirin and paracetamol even though full doses of diclofenac was prescribed by the physician⁴⁵.

The prevalence of self medication during pregnancy was low compared to the general population. This could be because drug use during pregnancy was mainly decided by the Obstetrician as revealed by the 5% prevalence rate from a multicentre study in Spain⁴⁶. The rate was 10% among pregnant women of varying gestational ages in another Spanish study⁴⁷.

Self medication and traditional medicine dominate alternative health care strategies of child health in the tropics⁴⁸. However, this practice is not limited to the tropics as a study in Spain showed that of children faced with acute illness, 86.6% previously self medicated for respiratory symptoms⁴⁹. Babies are not spared as large number are given “gripe water” for no valid reason or for only trivial symptoms by their mothers⁵⁰. Self medication could also account for why some fail to complete their hospital treatment especially for chronic illness. It was reported that 72.9% of the non-attenders at paediatric tuberculosis out-patient clinic self medicated with the antituberculosis drugs intermittently and beyond the period allowable⁵¹.

In patients with sexually transmitted diseases (STD), the prevalence of self medication might actually be higher than reported. A study in a STD clinic in the United States showed that while only 14% admitted self medication with antimicrobial agents, urinary assay was positive for 60% of those using the agents⁵². Failure to tell the truth on the questionnaire might be due to the stigma attached to their ailment. Urinary assay for household drugs was also used to determine drugs available for self medication from a survey of urban and rural households in Zimbabwe⁵³.

Malaria is one of the major killers in developing countries. The use of antimalarias was not free from self medication as revealed by a hospital-based study in Tanzania where 72.7% of patients reported having used home kept antimalaria medication for suspected malaria fever⁵⁴. People can also self-treat for malaria using herbal remedies or medications purchased from local shops as a study shows that 60% of malaria cases were self-treated through this means while only 18% received treatment at the local health centre⁵⁵.

People afflicted with chronic illness sparingly see a Doctor for their ailments as they learn to cope using self medication. It was reported that nearly six million Americans with self-treated arthritis never saw a Doctor for their condition even with severe limitation of activity⁵⁶. This was also seen among migraine sufferers in Kenya where a study revealed that 56% resorted to self medication though 40% sought medical attention⁵⁷.

Among commercial sex workers, self medication with antibiotics was perceived as a potential means of protection against STD and acquired immune deficiency syndrome – AIDS⁵⁸. In smokers, the practice may be used to self-treat negative effects with nicotine as evidenced by the occurrence of major depression in some who try to quit the smoking habit⁵⁹.

Health care providers are favourably disposed to self medication. It was reported that General Practitioners expected other Doctors to self-treat themselves rather than consult

their fellow colleagues⁶⁰. Tong and co workers reported a 60% “ever used” rate of self medication among pharmaceutical representatives probably due to their continuous exposure to drug samples of pharmaceutical companies⁶¹.

Self medication with antibiotics is a common practice. Of medications consumed for self treatment in Nigeria, it accounted for 63.4% in an urban slum⁶², 44% among urinary tract attendees prior to hospital admission⁶³, 39% among medical undergraduates⁶⁴ and 24% for treating menstrual symptoms⁶⁵. In addition, it accounted for a substantial percentage of diarrhoea treatment. A Nigerian study revealed that 53% of cases were self-treated with antibiotics while only 40% of cases were treated by prescriptions from the clinics⁶⁶. The self-treated cases were usually associated with a higher risk of using inadequate medication or dosage. Bojali et al reported self medication with antibiotic for diarrhea in 37% of cases even though it is indicated in 5% of cases. It is noteworthy also that about 27% of cases used inadequate antibiotics in terms of duration and dose⁶⁷ though previous study reported 67.7%⁶⁸. Among market women, self medication with antibiotics accounted for 18% of all drugs used for this practice⁶⁹. However, 90.4% of cases had incorrect knowledge about its dose and duration²⁰. Possible explanation for this high prevalence of incorrect dose had to do with the time constraint in following the six hourly regimes of antibiotics for at least five days. This may seem laborious once the symptoms abate compared to single daily drug dosages which antihelmintics, laxatives/purgatives and sedative/hypnotics are known for. This might account for the latter’s correct dose which are easy to remember²⁰.

Self medication with analgesics is a common practice. The prevalence rate among market women was 31.3% of all drugs used in self medication²⁰. A population-based study in Sweden revealed that 35% used a form of analgesics in the past two weeks due to self-perceived poor health and pain⁷⁰. A study among the disabled with painful ailments reveals that about 50% self medicated with analgesics everyday⁷¹. Majority of people with acute episodic headache self medicated with OTC analgesics which was believed to be more adequate than if prescribed while those with chronic headache treat themselves with prescribed drugs from previous doctor’s visit⁷².

In the dental profession, pain is the most likely symptom which could result in analgesic use without the Doctor’s prescription. Dentists are aware that patients with dental pain often use OTC analgesics on their own to alleviate symptoms or to avoid the need for dental attendance altogether^{29,33,73}. A study revealed that the current use-rate was 52.9% among children with post-operative dental pain⁷⁴. Apart from pharmaceutical products used by the majority, a minority patients use dangerous substances to alleviate dental pain such as battery water, local gin and ‘touch and go’ solution³³, petrol and vinegar²⁹.

Drugs used for self medication in some countries are prohibited or strictly regulated in other countries. A study of some Mexican Pharmacies revealed that while 14.3% of drugs sold are strictly regulated, 51.4% of such drugs were obtained for self medication purposes⁷⁵. Self medication with re-used needles and syringes for home injection of medications and vitamins may be a risk factor for transmission of HIV infection according to an exploratory study in the United States⁷⁶. Apart from using prescribed drugs, natural medicines have also been used. For instance, 35% of women referred to a Gynaecologist admitted self medication with natural medicines⁷⁷. Nutritional or dietary supplements like vitamins, minerals, herbal

products, tissue extracts and protein solutions are also used by Americans as dietary supplements, for energy and immune system enhancement and cancer prevention⁷⁸.

Self medication has some life saving advantages. It has been shown that people self treating reflux oesophagitis with antacids had a low prevalence of pre-neoplastic and neoplastic pathologies while the use of alginate in 68% of cases relieves symptoms⁷⁹.

4. Self medication and drug dependency

The abuse of various self medication compounds for chronic illnesses may or frequently lead to a state of dependency. Aspirin, acetaminophen and caffeine were the most frequently abused among chronic headache sufferers⁸⁰. Substance abuse and drug dependency have multiple causes ranging from poor instructions from the physician, improper diagnosis with gradual increase in amount consumed, a reinforcement mechanism and brain stimulation effects⁸⁰. For instance, cocaine acts directly on the “pleasure centres” of the brain to release dopamine which triggers an intense craving for more of the drug otherwise a painful withdrawal symptom persist. It therefore produces pleasurable sensation of “reward” and physical dependence⁸¹.

Nicotine, the psychoactive ingredient in cigarettes is an addictive agent that can stimulate and relax the user. Hence, some smokers self-treat negative moods with it⁵⁹. Approximately, 30% of women from a study conducted in the United States, smoke cigarette during pregnancy despite its deleterious effect on the mother and foetus⁸². The beverage, alcohol (ethanol) was so commonly consumed that it is seldomly thought of as a drug. When consumed in small quantity, it induces a feeling of well being and relaxation while in large amounts, intoxication is produced. It can therefore be used as a form of self medication to achieve any of these states⁸². It may also be used to cope with perceived problem of sexuality⁸³.

The relationship between self medication and drug dependency was explained with the self medication hypothesis of addictive disorders defined by Khantzian as motivation of patients to seek a specific drug (reinforcement mechanism) for relief of a particular set of symptoms for adaptive purposes⁸⁴. However, not all cases of drug dependencies follow this hypothesis because there are traits or symptoms which separate various groups of drug dependent individuals^{85,86}. As a result, Khantzian⁸⁷ revisited his theory in 2003 and stated that there was growing clinical support for the significant relationship between substance abuse disorders and psychiatric disorders as opposed to simple personality. Hence, people who are not receiving proper mental health treatment are attempting to selfmedicate for their disorders by using illicit substances.

5. Self medication – Sociodemographic and medical factors

Despite a growing research interest in self medication, little information has been available about its major determinants. Individual self care in illness is shaped in the social environment – a major determinant of the type and amount of health care services used⁸⁸. The sociodemographic determinants are age, gender, occupation, education, marital status, religion, race, income and culture. The sociomedical factors may be related to the female

reproductive role (pregnancy, breast feeding, and menstruation), psychiatric disturbance, medical states like asthma, migraine and so on.

The younger age group engaged in self medication than the older ones^{29,44,56,70,89,90}. However, some studies revealed no association between age and self medication^{16,24,91,92}. Women have above average knowledge about drugs and risks of self medication compared to men¹⁹. They also had a much higher probability of using supplements, OTC tranquilizers and analgesics for self medication than men who on the other hand commonly use more stimulants^{3,70,93,94}. Self medication with drugs to relieve depressive symptoms was far more likely in men than women⁹⁵. Factors related to general health status and women's reproductive role influences gender differences in self medication⁹⁶. During breastfeeding, self medication was dictated by the mother and her infant's disorder. In addition, women with pre-menstrual symptoms use caffeine as a form of self medication to relieve the symptoms⁹⁷. However, some studies revealed no association between gender and self medication^{16,91,92}.

Various studies consistently showed that self medication was associated with educational level. For instance, there is a positive correlation between level of education and self medication^{16,18,24,65,89,98,99}. The trend of consulting patent medicine dealers for prescription decreases with acquisition of more formal education^{24,98,100}. While studies showed no correlation between self medication and occupational status^{17,18}, others revealed some association. For instance, employment status affected the pattern of OTC and prescription drugs⁹⁶. Specialist in anaesthesiology, emergency medicine, general and family practice self medication than other medical specialist probably due to habitual overwork and unrestricted access to drugs¹⁰¹.

The relationship between race and self medication had been documented from various studies. Non whites had a higher probability of using tranquilizers than whites⁹⁴ and whites likely than blacks to consume supplements⁹³. Among the elderly, fewer blacks reported the use of OTC medications than non-blacks¹⁰². While some studies found little or no association between self medication and social status¹⁷, others reported that among school aged subjects, social classes of parents has a direct relationship with drug consumption among their children¹⁰³. The influence of culture is common in health related states and was related to female reproductive roles like childbirth, and in the treatment of morbidity and mortality in children¹⁰⁴. Athletes consume sex hormones to alter their menstrual cycle so as not to disturb the training schedule and competitive programme while some use anabolic steroids to enhance their performance¹⁰.

6. Self medication – Commonest complaint responsible

Usually, self medication is indicated for trivial symptoms perceived by the patient. It was favoured for skin condition, general health care, aches and pain, problems of the eye, mouth, gastrointestinal and respiratory tract¹⁰⁵. Among adult patients with acute pathology, the most common complaints were pain and increase body temperature¹⁰⁶. In a recent rural population study in Nigeria, it was in the order: malaria, gastrointestinal problems and urinary tract infections¹⁰⁷. Among rural Japanese housewives it was headache, tiredness and gastrointestinal problems while in American and British housewives, it was emotional or

psychological complaints¹⁰⁸. Among children, respiratory symptoms⁴⁹ especially for common cold⁹² with or without fever¹⁰⁹ were the commonest complaints.

With the use of antibiotics, the indication varies with different studies. The commonest complaints were for soft tissue, sexually transmitted diseases, upper respiratory and gastrointestinal tract infection¹¹⁰; upper respiratory tract infection⁹¹; respiratory infection³⁸; throat, dental and urogenital infection¹¹¹; respiratory tract infection and acute diarrhoea^{68,112} and diarrhoea, abdominal pain, fever and rashes²⁰.

For analgesics, the commonest complaints associated with its use are limb and back pain⁴⁵; self perceived pain and poor health⁷⁰; and body pain, headache, body weakness and fever⁵. Supplements are consumed for enhancement of diet, energy, immune system and for cancer prevention⁷⁸.

7. Self medication – Commonly used medications

Several medications have reportedly been used for this practice. This included antibiotics, analgesics and vitamins¹, analgesics, vitamins and oral antibiotics among primary care patients¹⁶, while for OTC drugs, the commonly requested were for nervous system¹¹³, analgesics, cough or cold medications⁴². Among adult married women, the commonly used medications were vitamins and contraceptives¹¹⁴.

Among market women surveyed in a sub-urban community in Nigeria, antipyretic analgesics, haematinics/vitamins, antibiotics, antimalarials and alternative or traditional medicines respectively were commonly consumed⁶⁹. In an European study of those presenting with acute illness, the most commonly used medications were analgesics and antipyretics¹⁰⁶ and among paediatric presentations were antipyretics, analgesics, antitussives and antibiotics⁴⁹. In a community-based pharmacy study in Portugal, the main therapeutic groups used for self medications were in the order: throat, cough, cold, stomatological, laxative, analgesics and dermatological products respectively⁵⁴; antibiotics and antimalarials for illness management¹⁰⁷ and analgesics and antibiotics in dental outpatients²⁰ from recent Nigerian studies; analgesics, cough, cold remedies, antiallergies, vitamin and energy tonic were the commonest OTC used as revealed from a recent review of selfmedication in India⁸⁹.

Orthodox medications were preferred to traditional African medicines for most common symptoms. However, some studies in developing countries revealed that people prefer traditional African medicines for diarrhea, vomiting, cough and cold¹¹⁵, rheumatic and neurological complaint¹⁰⁰. Among Hong Kong Chinese, Chinese tonic was the most frequently used traditional medicine for self medication which was perceived as equally effective as western medicine²¹. The most commonly used supplement among Americans were minerals, multivitamins, vitamin C, calcium, vitamin E and A⁹³ while the remaining percentage were for herbal products, megadose vitamins, protein and amino acid preparations⁷⁸.

8. Self medication – Places where drugs are obtained and sources of drug knowledge

The common places for drug supply were in the order: pharmacies, general medicine dealers, hospital/clinics, traditional sources, private practitioners and other sources¹¹⁵ like

household medicine cabinet containing previous medical prescriptions which may not have been prescribed for the same condition¹¹⁶. Recent studies agreed that the pharmacy, roadside/patent medicine stores were the commonest places where drugs were obtained for self-medication purposes.

Other studies^{90,117} also agrees that family medicine cabinet were sources of self medication. However, the common sources of household stock are chemist, pharmacy, supermarket, hospital/clinics, friends and relatives¹¹⁸. In developing countries common sources of antimalarials used for self treatment were street and village shops and this could account for up to half of antimalarial drug distribution¹¹⁹. Recent studies in Nigeria and Cameroun^{24,29} agrees with the above showing that the hospital/pharmacy, patent /road side medicine dealers, and local hawkers/mobile drug vendors and native healers were the commonest sources.

In choosing the most appropriate medicine to buy from the chemist shop, people relied on the advice of the sales clerk in the chemist shop¹, print media, family and friends^{24,29,120,121}, pharmacist, general medicine dealers, general and private medical practitioners²⁴. Among the young ones, sources of drugs knowledge include family members especially the mother (for therapeutic purposes), peer groups and illegal market (for intoxication purposes)¹²². Among secondary school pupils in an Hong Kong study, the sources were in the following order: family members, previous illness experience, pharmacy shops, doctors or nurses, television or radio, newspaper or magazines, friends and teachers⁹⁰.

For painful condition, people self select drugs for self medication while small percentages were advised by the pharmacist or non-health professionals^{65,123}. Since individuals suffering from sexually transmitted diseases often treat themselves with antibiotics, the common sources of drug supply were the medicine cabinet at home and the sources of drug knowledge were family members and friends. For dietary supplements, the principal source of drug information was the mass media⁵².

9. Self medication – How and when

People who self medicated reported taking one or several medications and more often one or two medications were involved^{20,26,33,116}. Individuals sometimes self administer medications via drug identification. Trade names were common means of identification and less frequently by generic names, action, color, shape and common usage names^{24,124}.

In painful complaints, the number of analgesics and duration of consumption was directly related to the intensity of the pain¹²³. This was collaborated by a study among dental patients which revealed that the majority use analgesics within one week of presentation and only present when the pain did not resolve²⁰. Self medication is commonly associated with subcurative doses. This can be seen from antimalaria therapy with chloroquine either administered orally or via injection⁹⁸ and with antibiotic use where two-third of individuals used it for less than five days or in insufficient quantity^{20,68,112}.

Among pregnant women interviewed, over fifty types of symptoms necessitated self treatment⁴⁷. In asthmatics, most of the sufferers tended to reduce their doses of medication following improvement of their symptoms³⁹. Sometimes, consumption of household

medications may be incorrectly volunteered but could only be confirmed by urine screening test for such medications⁵³.

10. Self medication – Side effects and risk

Although these medications are considered risk free and useful for the treatment of common health problems, their excessive use can also lead to serious side effects and unfavourable reactions⁸⁹. For instance, the therapy may be poorly suited for the illness in question, delay diagnosis and the beginning of effective therapy, increased inorganic risk(s) due to inadequate drug therapy or of unnecessary expense¹¹⁶ and drug interaction between prescription and non prescription drugs⁹⁹.

The prevalence of side effects was associated with lack of knowledge about the drug prior to its usage²¹. Insufficient curative treatment with chloroquine (CQ) for individuals who treat themselves for suspected malaria fever could result in resistance to *Plasmodium falciparum* – the agent causing the ailment^{125,126}. Chronic CQ toxicity was important in the causation of heart block in Africa, CQ retinopathy and abnormal ophtalmological findings, cardiac arrhythmia^{127,128}. Stevens-Johnson syndrome following self medication with Fansidar has been reported¹²⁹.

With respect to OTC medications, reported risks associated with the improper use includes addiction, gastric irritation, liver toxicity, rebound headache syndrome⁴¹, milk alkali syndrome¹³⁰; dental caries from prolonged usage of self administered mineral supplement containing lactose¹³¹; liver toxicity/failure following prolonged use of analgesic containing paracetamol for dental pain¹³²; peripheral neuropathy and subdermal vascular dermatosis following Vitamin B6 megatherapy¹³³; cholinergic excess, loss of consciousness and seizure following cutaneous application of Diazinon, an organophosphate insecticide for pubic lice¹³⁴. In addition, laxative abuse causing ammonium renal urate calculi, gastrointestinal fluid and electrolyte loss resulting in chronic extracellular volume depletion and intracellular acidosis had also been reported¹³⁵. Simbi et al recently reported in-utero-ductal closure following near term maternal self medication with Nimesulide and Acetaminophen¹³⁶. Self administered oral diuretics could result in pseudo-barter syndrome (hypokalaemia, metabolic alkalosis, hyperaldosteronism, hypomagnesium, normocalcemia and hypocalcuria)¹³⁷. Topical anaesthetic abuse of the cornea with subsequent fungal (candida) keratitis¹³⁸ and severe toxic keratopathy¹³⁹ had been reported.

Sometimes, the side effect which could be dermatological tends to be the primary cause of drug intolerance. For instance, cutaneous manifestation of psoriatic arthritis could be exacerbated with ibuprofen self therapy¹⁴⁰, fixed pigmented eruptions could be manifestation of such drugs, which if unrecognized, might be fatal if such a drug was repeated¹⁴¹.

Among the elderly, adverse reaction to drugs are characteristically more frequent and severe as a result of factors including self medication¹⁴². In the case of substance abuse, depending on the substance used, it may result in organ damage, medical complications, vascular injury, less than satisfactory quality of life and depression⁸⁰. Among alcoholics, male and female fertility can be interfered with⁸².

Drug use before hospital admission is a source of potential drug toxicity and may obscure the diagnosis of infective illness and delay hospital stay¹⁴³. It has been shown that the five most common adverse events following self medication related hospitalization were upper gastrointestinal bleeding¹⁴⁴, skin rashes, hypoglycaemia, hypercorticism and hepatitis¹⁴⁵.

11. Reasons for self medication

The common reasons could be to cure an ailment²⁴, suppress its cause indefinitely to give the body time to completely overcome it or for prevention, prophylaxis, palliation, convenience, postponing a natural event, out of habit or for special purposes¹⁰. In some cases, the main reasons could be triviality of the symptoms^{24,25,105}, to save money and time^{16,24,33,120}, lack of gravity to go and see a physician because they can take care of themselves¹¹⁷ or previous medical prescription for related symptoms^{21,109}.

In specific diseases like acute non specific diarrhea, people self medicated because the ailments were of short duration, can be treated symptomatically with non-prescription medications and adequate hydration and do not require a visit to the physician office¹⁴⁶. In the case of chronic illnesses, it could be the cost of medication, patient's psychological status, perceptions of the seriousness of their illness and vulnerability to complications¹⁴⁷. For antimalarials, self medication with orthodox medication was greater than traditional remedies because of their efficiency, popularity, cheapness and availability⁹⁸, distance and cost of seeking care from the formal health service⁹⁹ and cultural beliefs¹⁴⁸. Among market women, reasons given for self medication was in the order: for minor ailments, cheapness and because they know what to do²⁴.

Among dental patients, since the commonest complaint was pain, the main reason for self medication was to serve as a means of avoiding the need for dental attendance altogether⁷³. Acute headache sufferers may treat themselves with OTC if they perceive it to be more adequate than prescribed drugs⁷². Reasons for using psychoactive drugs among the young people range from insomnia, worry or depression to intoxication¹²² while smokers may self treat negative effects like major depression with nicotine⁵⁹.

12. Self managed health care

Self medication is a necessary and important aspect of daily health care. It encourages self reliance for curative, preventive, promotive and rehabilitative care¹⁸. It appears to be substitute for, rather than supplements or stimuli for health service utilization¹⁴⁹. In the Federal Republic of Germany and Switzerland, its importance in health care system had been recognized because of possibility of self treatment of minor illness and its health economic benefits^{150,151}.

Since individuals have a certain right to reasonable self mediation, an important aspect of a qualitative improvement of the practice was the information, education and counseling of the patient of which the pharmacist plays a major role¹⁵². In view of this, Ruegg reported that pharmacist in Switzerland had accepted this aspect of patient's education and are adjusting their education to the problems of self medication¹⁵⁰. This role of Pharmacist had also been suggested in a later study^{24,153}.

In some cases, the practice is frequently and successfully used. An Australian-based study revealed that in only 2% of cases self treatment for minor ailments were the actions taken assessed as inappropriate and potentially harmful¹⁵⁴. This agrees with a later study which showed that few, if any were consuming nutrient supplements in amount considered toxic⁹³ and that most consumers used self medication preparations in a safe and proper way¹⁵⁵. This agrees with other studies^{20,109}. Hence, in some patients, self medication was recommended if they continue to have recurrences of a chronic infective process¹⁵⁶. Further, because OTC drug sales statistics reflects pattern of self medication, it may be used to monitor the practice⁴.

The above reflects the need for a liberal regulatory environment and comprehensive information package in consumer-oriented language. This could be achieved via consumer-oriented advertisement and consumer product package leaflet. Advertisement gives consumers choice to determine what to buy. The government benefits since the consumers can buy OTC drugs with their own money and does not engage government health care budget for minor ailments¹⁵⁷. Hence, one potential means of reducing pressure on the health budget of a country's gross domestic product (GDP) is a greater reliance on self health care⁷. In a rehabilitative setting, patients could be actively involved in their medication program and be independent on the use of their medications when they leave hospital. A self medication program fulfills this role^{158,159}.

Therefore, during drug advertisement, advertising agencies should emphasize the possible side effects as they do for cigarette smoking. By this people are well informed as they read or hear it (especially if illiterate). Because the practice of self medication is worldwide, careful drug history by General Practitioners and Physicians is important to know what patients are taking before treatment commences especially when subtherapeutic doses are involved.

13. Conclusion

Self medication is a necessary and important aspect of primary health care which if properly managed could be incorporated in the health care delivery system to reduce the burden on the secondary and tertiary level so that attention could be focused on the more serious health problems.

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Human behavior accounts for the majority of morbidity and premature mortality throughout the world. This book explores several areas of human behavior including physical activity, nutrition and food, addictive substances, gun violence, sexual transmitted diseases and more. Several cutting edge methods are also examined including empowering nurses, community based participatory research and nature therapy. Less well known public health topics including human trafficking, tuberculosis control in prisons and public health issues in the deaf community are also covered. The authors come from around the world to describe issues that are both of local and worldwide importance to protect and preserve the health of populations. This book demonstrates the scope and some of the solutions to addressing today's most pressing public health issues.

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