

**A SURVEY ON PARENTS' KNOWLEDGE ON ANTIBIOTIC RESISTANCE
UPON SELF-MEDICATION IN CHILDREN OF DHAKA CITY**

Submitted By

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ID: 2011-1-70-039



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East West University**

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A Dissertation submitted to the Department of Pharmacy, East West University, in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy

Submitted By

Anoy Howlader

ID: 2011-1-70-039



**Department of Pharmacy
East West University**

DECLARATION

I, Anoy Howlader, hereby declare that this dissertation, entitled “**A survey on parents’ knowledge on antibiotic resistance upon self-medication in children of Dhaka city**” submitted to the Department of Pharmacy, East West University, in the partial fulfillment of the requirement for the degree of Bachelor of Pharmacy (Honors) is a genuine and authentic research work carried out by me. The contents of this dissertation, in full or in parts, have not been submitted to any other Institute or University for the award of any Degree or Diploma of Fellowship.

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CERTIFICATION BY THE SUPERVISOR

This is to certify that the dissertation, entitled “**A survey on parents’ knowledge on antibiotic resistance upon self-medication in children of Dhaka city**” is a bona fide research work done, under my guidance and supervision by Anoy Howlader (ID: 2011-1-70-039), in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy.

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ENDORSEMENT BY THE CHAIRPERSON

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Dedication

This Research Paper Is Dedicated to My Beloved Parents, Who
Are My Biggest Inspirations

Abstract

The increased rate of prevalence and associated risk of antibiotic resistance in children is an important issue to consider in the global world lately. The consequences fall on both the children and the parents and it may increase the rate of multiplication of bacterial infection although in the presence of adequate therapeutic level of antibiotics. The aim of the present study was to determine parents' knowledge on antibiotic resistance in children of Dhaka city in Bangladesh. This prospective study included parents of 128 children. They were surveyed with a standard, structured questionnaire. In this study, we have found that 49 of the respondents believed that antibiotic resistance is promoted by unnecessary use of antibiotics, whereas 32 disagreed and 13 had no idea about it. Moreover, 62 of the respondents agreed to the consequences of promoting antibiotic resistance by not completing the full course therapy; 23 of them didn't agree or disagree and 15 of them didn't know. In addition, 44 of the respondents didn't believe that antibiotic resistance is grown by self-medication, whereas 22 of them didn't have any idea. Again, 47 of the respondents agreed to the statement that antibiotic resistance is promoted by using antibiotics with other drugs simultaneously, while 35 of them didn't agree or disagree and 19 of them didn't know anything. About 52 of the respondents agreed to treat their children with antibiotics in viral infection with fever, but 34 of them had no idea of that. Later, it was found that 46 of the respondents believed that antibiotics will always be effective in the treatment of same infection in future, while 35 of them didn't know. In this situation, it is essential to build awareness among the parents about the consequences and drawbacks of self-medicating with antibiotics for the treatment of their children, which will ultimately trigger a better outcome in future. Control and regulation of self-medication of antibiotics is also required so that the children can acquire better treatment and lead a healthy life afterwards.

Key Words: Antibiotic Resistance, Bacterial Infection, Dhaka, Bangladesh, Children

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1. Introduction

Children constitute a large percent of the population in developing countries. Children drug utilization is of great concern globally and has received a lot of attention. Many studies have been conducted in this field in the developed and developing countries, and have all shown various problems ranging from misuse and abuse of prescribed drugs. Most drugs in children are used outside the health settings with or without prescription. The initial response to various illnesses in their children among many families has been found to be self-medication (Eldalo, El-Hadiyah and Yousif, 2013).

1.1 What is Self-medication?

Self-Medication involves the utilization of medicinal products by the consumer to treat self-recognized disorders or symptoms or continued use of a medication prescribed by physician for chronic or recurring diseases or symptoms. It also includes use of the medication of family members, in case of the treatment of children or the elderly is involved (Apsmi.net, 2016).

Self-medication has traditionally been defined as “the taking of drugs, herbs or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor (Hernandez-Juyol and Job-Quesada, 2002).

It is a broad concept encompassing-

Hygiene (general and personal)

Nutrition (type and quality of food eaten)

Lifestyle (activities, leisure)

Environmental factors (living conditions, socio habits)

Socioeconomic factors (income level, cultural beliefs) (Gutema et al., 2011)

Self-medication is included under self-care and is a form of patients' contribution to health related decisions (Mansouri et al., 2015).

Self-care is what people do for themselves to establish and maintain health, prevent and deal with illness and Self-medication is the selection and utilization of medicines by individuals to treat self-recognized or identified illnesses or symptoms (Apps.who.int, 1998).

In 1998, a special working group of the World Health Organization (WHO) offered an inclusive definition of "Self-care":

"'Self Care' in health refers to the activities individuals, families and communities undertake with the intention of enhancing health, preventing disease, limiting illness, and restoring health. These activities are derived from knowledge and skills from the pool of both professional and lay experience. They are undertaken by lay people on their own behalf, either separately or in participative collaboration with professionals" (Asmi.com.au, 2015).

Self-medication is one element of self-care (Apps.who.int, 1998).

Self-medication is the use of medicines which is designed and labeled without medical supervision and approved as safe and effective for such use in the treatment of common health problems. Medicines for self-medication are also known as 'nonprescription' or 'over the counter' (OTC) and are available without a doctor's prescription through pharmacies. In some countries OTC products are also available in supermarkets and other outlets. Medicines that cannot get without a doctor's prescription are called prescription products (Rx products) (Jain et al., 2012).

Self-medication with OTC medicines is sometimes referred to as 'responsible' self-medication to distinguish this from the practice of purchasing and using a prescription medicine without a doctor's prescription. This is irresponsible (and potentially even dangerous) 'self-prescription', and has no place in self-care or (responsible) self-medication. Self-medication is an age old practice. Urge of self-care, feeling of sympathy towards family members in sickness, lack of health services, poverty, ignorance, misbelieves, extensive advertisement and availability of drugs in other than drug shops are responsible for growing trend of self-medication (T.K. et al., 2011).

In 1995 the WHO Expert Committee on National Drug policies stated: "Self-medications is widely practiced in both developed and developing countries. Medications may be approved as being safe for self-medication by the national drug regulatory authority. Such medicines are normally used for the prevention or treatment of minor ailments or symptoms, which do not justify medical

consultation. In some chronic or recurring illnesses, after initial diagnosis and prescription, self-medication is possible with the doctor retaining an advisory role” (Jain et al., 2012).

In developing countries like ours, self-medication in children is a point of concern now-a-days. Self-medication with over-the-counter (OTC) drugs like paracetamol (PCM), NAPA among children and adolescents is increasing and contributes an important public health issue internationally. But the reasons behind this development are unclear; parental influence is suggested. But latter it was shown that maternal health did not motivated child use of OTC analgesics (Jensen et al., 2014).

Symptoms like fever, headache, cough, dehydration, respiratory syndromes are common in Bangladesh among the children. The use of medicines whether is it self- medicated or consulted with doctor in the treatment of this symptoms may depend on many factors. In many countries, the antipyretic drugs and other over-the-counter (OTC) medicines are commonly used among parents to treat their children (Eldalo, El-Hadiyah and Yousif, 2013).

In few non-systematic studies shows that the prevalence of self-medication in Brazilian children, which found results from 7.1 to 53.2% for different age groups (Pereira et al., 2016).

Despite the widespread use of self-medication among the child population and the potential harm it can do, up-to-date epidemiological data on self-medication are sparse worldwide.

If the most pediatric OTC drugs such as vitamin supplements and dermatological preparations used properly i.e. according to the package insert, then it is safe. Nevertheless, parents and adolescents may have insufficient knowledge about the medicines they use, which can cause inappropriate drug use sometimes it can be serious, adverse drug effects among self-medicating children and adolescent (Du and Knopf, 2009).

But Major problems related to self-medication are wastage of resources, increased resistance of pathogens and causes serious health hazards such as adverse reaction and prolonged suffering. Antimicrobial resistance is a current problem world-wide particularly in developing countries where antibiotics are available without any prescription. It is alarming that the prevalence rates are on the rise despite efforts to limit these problems. Various studies show that self-medication practices are more common to the people who have a lower socio economic status, have minor

ailments. self- medication is a common practice in developing countries as it provides a low cost alternative for people who cannot afford the high cost of clinical service and also as many drugs are dispensed over-the-counter without prescription from a register medical practitioner and prior experience of treating same illness. Now it is a great concern for us the prevalence of self-medication in children in Bangladesh (Bennadi, 2014).

1.2 Historical perspective of self-medication

The neotropical ecologist Daniel Janzen proposed that self-mediation may exist in primates, and other animals was. He asserted that animals using plants for parasite infection and other ailments. The first example of self-medication in chimpanzees is a behavior called leaf swallowing. Chimpanzees swallowing *aspilia* leaves might be similar to human drinking coffee It is natural habit of people whenever they feel sick, they try to do something or take something for themselves. In the very earliest time in any culture anywhere in the world there is an evidence of using or doing whatever the injured people thought appropriate for them to relieve from distress or sickness (Leake, 1965).

Throughout human history the dominant paradigm of healthcare was individual self-care in the family and local community. Treatment involved self-treatment with locally-produced preparations which efficacy was generally uncertain or unknown. In the 1970s and 1980s the conditions generally considered as suitable for people to treat themselves without the intervention of a doctor were quite limited. They included mild to moderate pain, coughs and colds, constipation and minor skin problems such as cuts and bruises, for which a limited range of medicines were available for self-medication. A new era of access to modern, effective medicines was heralded in the early 1980s, when medicines which had previously only been available on prescription began to be switched to nonprescription status. Among the first products switched to nonprescription status was ibuprofen for the treatment of pain, in the UK (1983) and the US (1984). In Canada, hydrocortisone became available without a prescription in 1986 (Wsmi.org, 2014).

In 1972, the FDA initiated a review of nonprescription drugs that for the first time spotlighted and validated the critical presence of nonprescription drugs in the consumers' market place. Herbal and other plant-derived remedies have been estimated by the World Health Organization (WHO)

to be the most frequently used therapies worldwide. In 1991, herbal products were sold of approximately \$1 billion, although precise levels of use of these remedies in the United States were unknown. Previous reports about herbal remedies in the rural South have described the use and biologic activities of locally gathered plant species and details of preparation and dosage, but have not determined the prevalence of use of plant-derived remedies in specific disease in the study population (Centers for Disease Control and Prevention (CDC), 1995).

Self-medication had also been derived from the others sources outside plants. 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 equilibrium 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 treat (Afolabi, 2008).

1.3 Reasons for self-medication

Self-medication is very common and a number of reasons could be enumerated for it. These included socioeconomic factors, lifestyle, ready access to drugs, the increased potential to manage certain illnesses through self-care, and greater availability of medicinal products (Gutema et al., 2011).

A study on Yemen showed there was a significant difference between the prevalence of self-medication with antibiotics and the sex of the patients. In the present study, the results showed that female children were more exposed to self-medication than males. This can be explained by the fact that many families in Yemen prefer male children than females, so they seek medical advice for boys early without trial of antibiotics without prescriptions (Mohanna, 2010).

Home- and self-treatment is a central part of local medical culture in Kenya societies, where people are used to taking treatment into their own hands. Most common illnesses are dealt with by lay

people on their own; only when an illness is prolonged or serious do people seek expert advice, be it a local healer or a biomedical professional (Geissler et al., 2000).

The common reported reasons for self-medication were shortages of drugs at health facilities, long waiting time at health facilities, long distance to health facilities, inability to pay for health care charges and the freedom to choose the preferred drugs in Tanzania. The participants preferred self-medication practice due to freedom of choosing the drug of their choice. Some participants said that if they go to the pharmacy/drug shop, they were able to make the decision on which drug to use. Also, they admitted going to the pharmacy/drug shop because they could obtain drugs such as quinine and anthelmintic, which they believed would cure their sick children but these drugs were rarely prescribed from health care facilities (Chipwaza et al., 2014).

According to a report the reason for self-medication, given in male (35.48%) and female (15.56%) used self-medication due to the lack of time, 32.26% male and 26.67% female used self-medication due to high consultant fee of Physician, 29.03% male and 11.11% female wants quick relief, 3.33 % male and 24.44% female believe in Ayurveda. There are some cases of female (6.67%) in which there is no family support hence they use self-medication, 15.56% female used self-medication due to their inability to walk. There are some other reasons like wider availability of medicine, greater choice of treatments, ease of access an active role in his/ her own health care and self-reliance in preventing or reliving minor symptoms or condition, ailment was minor and financial constraint (Jain, Malvi and Purviya, 2011).

In a study of WHO self-care medication identified patients' reasons for self-medication The commonest was that the illness was regarded as minor (80.2%). More than two-thirds of respondents (70.1%) indicated that they self-medicated because health care facilities were unavailable at times when they needed care. More than half of self-medicated respondents (52.0%) reported that they did so because they lacked the time to visit formal health care facilities. More than 40% of self-medicated patients indicated that the cost of consultations with the doctor was a reason for self-medication. Other reasons for self-medication were expectations of less/no benefit from modern health care, remoteness of health care sites and convenience (Alghanim, 2011).

Therefore, most common reasons of self-medication are found to be (Jain, Malvi and Purviya, 2011):

Extreme poverty:

This condition has affected every aspect of living in developing countries including our health, people don't want to go to hospital as they cannot afford to pay for drugs or hospital bills. Thus they prefer to go to chemist or pharmacies to save cost at the expense of their health.

Ignorance:

Many people are unaware that drugs can harm and hence need proper advice from qualified personnel before use, but ignorance of people about the adverse effect of drugs leads to severe problem.

Lack of easy excess to some prescribed drugs:

Sometimes people have to go to long distance to get their prescribed drugs. Therefore, they prefer to settle for more easily available alternatives.

Quackery:

There are many unqualified people work as health professional who prescribe drugs willingly who have worsened the case of self-medication.

Lack of proper enforcement of existing laws:

On drugs procurement in most developing countries.

Wrong attitude of people:

Many people lack proper medical because of their tight schedule or are too busy and thus prefer to engage self-medication.

Weak health system:

Many of health system are weak and lead many people to losing faith in them.

Wrong claims by alternative medicine suppliers:

This is another great problem. Many traditional and alternative medical practitioners are guilty of making money by deceiving people.

Religious misconception:

The proliferation of different religious houses, ideologies now-a-days has had some negative impacts on health. Some people have some misconceptions that prevent them from seeking proper medical care. Example of these people is who refuse to go to hospital because they have been told they must not take injections or drugs.

There are also some other reasons are which are less common:

Urge of self-care:

Due to business or hurry people avoid going to doctors and do self-medication. They become too busy to treat themselves as soon as possible with maximum result.

Self-need to play active role:

Some people think that what they do or what they use is right. They consider themselves intelligent and avoid going to doctors for advice.

Illness to be minor:

If illness is minor, then people especially poor people avoid going to hospital or doctors. They take advice from others and take medicines.

Embarrassed of discussing their symptoms:

People of developing countries as they have less education, women do not go outside often from religious due to cultural or religious reservations feel shame to discuss their internal problem with doctors and often do self-medication.

Suggestion of friend or relatives:

Sometimes people take suggestion from friends or relatives who got benefit from medicines and advice others to take the same medicines for disease similar to theirs. This can lead to error in therapeutic outcome (Mumtaz et al., 2011).

1.4 Medication commonly used in Self-Medication

Some medicines are commonly used to self-medicate which has been reported. This included antibiotics, analgesics, vitamins, oral antibiotics, pain relievers, cough remedies, creams, antimicrobials among primary care patients, while for OTC drugs the commonly requested were for nervous system, analgesics, cough or cold medications (Antonov and Isacson, 1998).

A qualitative survey reported that parents in Mongolia used antibiotics such as chloramphenicol to treat child diarrhea and another study noted that 32–35% of families practiced self-injection at home. The present study suggests that caregivers in Ulaanbaatar commonly use non-prescribed antibiotics for children younger than 5 years of age. Some determinants of this practice were the child's age, caregivers' misconceptions about the efficacy of antibiotics for upper respiratory tract infections, caregivers' own experience with self-medication, and the availability of antibiotics at home (Togoobaatar et al., 2010).

In another survey a random sample (n = 13,295, response rate 79.4%) of the Swedish population aged 16 years and older was interviewed about health, medication use and related matters, among other things. In all, 35% of the population used analgesics at least once during a two-week period, and analgesic use was more than 50% higher among women than men. Analgesic use was less common among those aged 45-64 years and 65-74 years than those 18-44, after controlling for all other variables. The study showed that self-perceived poor health and pain explain much analgesic use. Analgesic use is further explained by lifestyle, sleeping problems, and health care utilization. Marital status, educational level, socioeconomic status, social network and working conditions were found to be of minor importance (Antonov and Isacson, 1996).

In a study of United Arab Emirates prevalence of antibiotic use with and without a prescription was high (40 %). The pharmacy was the main source where the majority (slightly more than 90%)

obtained antibiotics. The course of antibiotic was completed by larger number of respondents with (75.3%) than without (632.5%) prescriptions. Influenza, upper respiratory tract infection, skin conditions, gastrointestinal problems and urinary tract infection were the conditions for which antibiotics were used. The most commonly prescribed antibiotics were amoxicillin (42.1%), amoxicillin-clavulanic acid combination (40.9 %), and penicillin (6.8%). On the other hand, for self-medication respondents, the order was slightly different with amoxicillin-clavulanic acid combination (48.9 %), amoxicillin (27%) and penicillin (10.1%). Similar numbers of respondents obtained prescribed (93.2%) and self-used (92.1 %) antibiotics from pharmacy while the rest used antibiotics stored at home. Surprisingly, large numbers of both groups of students were aware of bacterial resistance associated with misuse of antibiotics (Sharif, 2012).

Of the 9281 participants, in Jordanian survey among 2133 (23%) were using antibiotics over the study period: 842 (39.5%) of them were self-medicating with antibiotics and 1291 had antibiotics prescribed for treatment. The analysis of questionnaire data showed that the main source of antibiotic supply were the previously prescribed antibiotics stored in the household (392) or purchased at retail pharmacies (370). Supplies by friends and relatives accounted for about 68 cases (Al-Azzam et al., 2007).

Table 1: List of drugs used for self-medication (Bennadi, 2014)

Category	Drugs
Cough and cold	D-cold Total, Corex, Benadryl glycodin
Analgesics	Saridon, Disprin, Diclofenac, Nimesuide
Antipyretics	Calpol, Crocin
Antiseptics	Detol, Boroplus
Antibiotics	Ciprofloxacin, Norfloxacin, Amoxicillin, Cefadroxil
Others	Dabur Chawanprush

Analysis in 2005 shows that 10% of participants (n=315) self-reported taking one or more nonprescription medications in the past 2 weeks for a perceived cardiovascular health purpose. Among these individuals, prevalence of use of vitamin/mineral supplements, non-vitamin/ non-mineral supplements, and over-the-counter products for a cardiovascular purpose was 37.5%, 21.3%, and 54.6%, respectively. Popular perceived cardiovascular health (NONRX-CVHs) were aspirin (52.1%), vitamin E (24.4%), garlic (9.8%), and omega-3/fish oils/fatty acids (3.8%). NONRX-CVH users were older than general nonprescription users ($p < 0.001$). Of 613 people using a prescription drug for cardiovascular reasons, 135 (22%) reported using one or more NONRX-CVH medications (MB et al., 2006).

Aspirin, acetaminophen and caffeine were the most frequently abused among chronic headache sufferers. 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 cold, rheumatic and neurological complaint. Among Hong Kong Chinese, Chinese tonic was the most frequently used traditional medicine for self-medication which was perceived as equally effective as western medicine. The most commonly used supplement among Americans were minerals, multivitamins, vitamin C, calcium, vitamin E and A while the remaining percentage were for herbal products, mega dose vitamins, protein and amino acid preparation (Afolabi, 2008).

Among market women surveyed in a sub-urban community in Nigeria, antipyretic analgesics, hematinic/vitamins, antibiotics, antimalarial and alternative or traditional medicines respectively were commonly consumed. In a European study of those presenting with acute illness, the most commonly used medications were analgesics and antipyretics and among pediatric presentations were antipyretics, analgesics, antitussives and antibiotics. In a community-based pharmacy study in Portugal, the main therapeutic groups used for self-medications were in the order: throat, cough, cold, stemmatological, laxative, analgesics and dermatological products respectively antibiotics and antimalarial for illness management and analgesics and antibiotics in dental outpatients from recent Nigerian studies; analgesics, cough, cold remedies, anti- allergies, vitamin and energy tonic were the commonest OTC used as revealed from a recent review of self-medication in India (Bennadi, 2014).

1.5 Sources of information for self-medication

In developing countries which are economically deprived countries most episodes of illness are treated by self-medication. Whether one lives in a developing country or in a developed one, the sources of information are similar. A person may seek advice from 'an older person in your household who possesses the knowledge of simple herbal remedies for common illnesses' or with a pharmacist because they can 'provide a good help to assess the symptoms' and 'spend time explaining how to use the medication properly' Or one may purchase an OTC medicine 'based on a previous medical recommendation', A study shows that the commonest source of information was the private sector pharmacy salesmen (including pharmacists), reported by about three-quarters of respondents (74.0%). This was followed by respondents' experiences or knowledge from previous episodes (50.8%). Health staff was the least common source of information, reported by only 9.6% of respondents. Other sources of information about medications were relatives/friends, the Internet and advertisements (Alghanim, 2011).

In a study of rural area of Barabanki showed that the important sources of information for self-medication were previous prescription of doctors (72.6%), friends and neighbors (52.4%) and chemists (38.1%) In present study, most common reasons for favoring self-medication were time saving (45.2%) followed by high cost of consultation (42.3%), minor illness (39.9%) followed by convenience (25.0%) (Keshari, Kesarwani and Mishra, 2014).

The common sources of drugs in self- medication (Bennadi, 2014):

Previous prescriptions	Local hawkers
Traditional sources	Native helpers
Advertisements	Internet
Family and Friends	Chemist shop
Magazines	Books
Pharmacists	Leaflets along with OTC drugs

1.6 Advantages of self-medication

Self-medication has been successfully integrated into many health care systems throughout the world. It is widely accepted that self-medication has an important role to play in health care and, with the continued improvement in people's education, general knowledge and socio-economic status, self-medication has been successfully integrated into many health care systems throughout the world (Apps.who.int, 2000).

Self-medication is not necessarily something to be frowned upon, but it is something that one needs to be cautious about. Most health care professionals also avoid treating themselves and when faced with any illness will seek medical attention. Self-medication does offer tremendous benefits, particularly when faced with non-threatening infections like the common cold or mild backaches and so on. In such scenarios self-medication is beneficial as it gives you a greater role in your own health care. Keep in mind that self-medication does not mean that you should rely on drugs and strong medication but instead you can use home remedies and natural treatment methods to get rid of a minor but persistent problem. This also reduces your dependence on health care professionals, whose skills and expertise are indispensable in the treatment of more serious health conditions. This also reduces health care costs for the government.

Some drugs in the UK and USA which have been deregulated in the past decade from prescription-only category to availability without prescription. The deregulation process has been championed by the pharmaceutical industry, the pharmacy profession and government health policy maker and is supported by the acceptance that patients wish to have a greater role in their own treatment (Hughes, McElnay and Fleming, 2001).

In developed countries, self-medication has also been used very widely to combat behavioral and psychological problems such as smoking. According to the 2009 World Self Medication Industry (WSMI) statistics nicotine replacement therapy in the United States, the first year after its switch to non-prescription status, yielded an estimated 114000 to 304000 new former smokers annually. That is up to 300000 people each year who are able to reduce their risk of lung cancer, emphysema, stroke, heart attack and complications in pregnancy because of self-care products that help them stop (AL Bashtawy et al., 2014).

Self-medication also has advantages for health care systems as it facilitates better use of clinical skills, increases access to medication and may contribute to reducing prescribed drug costs associated with publicly funded health programs. Expected health benefit from self-medication depends on perceived effectiveness of self-medication. In a world of scarce government and in many countries scarce individual resources, responsible self-medication should be a cornerstone of healthcare provision and health policy (Hughes, McElnay and Fleming, 2001).

Responsible self-medication may include:

1. Help to prevent and treat symptoms and ailments that do not require a doctor.
2. Self-administration helps patients to learn and understand about their medication regimes, which may lead to better compliance
3. Increase the availability of health care to populations living in rural or remote areas.
4. Enable patients to control their own chronic conditions.
5. Cost effective
6. Education opportunities on specific health issues (i.e. stop smoking aids and products to treat heartburn)
7. Convenience
8. Patients are able to take their medications in accordance with their usual routines thereby reducing the potential for harm with, for example incorrectly timing insulin administration. This is especially important with medications such as those to treat Parkinson's disease where patients have very specific dose timing schedules to optimize symptom control.

These benefits translate into patient and consumer wellness and productivity, economic gain for employers, and cost savings to healthcare budgets through reduced medicine budget cost and reduced physician visits. These conditions aim at ensuring the safety of taking self-medicated drugs (Jain, Malvi and Purviya, 2011).

Good self-medication can also provide benefits in community level such as:

Saving scarce medical resources from being wasted on minor conditions

Lowering the costs of community funded health care programs

Reducing absenteeism from work due to minor symptoms

Reduce the pressure on medical services where health care personnel are insufficient

Increase the availability of health care to populations living in rural or remote area (Bennadi, 2014).

Infections are illnesses which usually present acutely. Patients may therefore benefit specifically from the greater immediacy and convenience of access to antibacterials (as discussed above). This could potentially shorten the period of illness, reducing both the length of symptoms and the period of infectivity. The OTC availability of treatment for vaginal candidosis and herpes labialis probably shortens the delay between onset of symptoms and start of effective treatment (Reeves et al., 1999).

Society benefits from a citizenry that is better informed about healthcare and therefore abler to exercise self-reliance. Having the tools available to help consumers practice such self-reliance also allows scarce health resources to be directed toward illnesses or conditions that require treatment in the professional healthcare system. Having appropriate nonprescription medicines available can also reduce illegal use of prescription products without a prescription – something which occurs too frequently in some countries, and is sometimes referred to as “self-prescription.” In Mexico, for example, an increase in the availability of nonprescription medicines helped to reduce the estimated rate of “self-prescription” by 20 percent from 1989 to 1999 (Wsmi.org, 2014).

1.7 Disadvantages of self-medication

Despite the significant benefits of self-medication there are some inherent risks as well. The irresponsible use of over the counter medications can be particularly damaging and this is in fact the biggest risk. The risks of self-medication go beyond simple over reliance on drugs and

remedies. When individuals with no knowledge or limited knowledge of medicine and health care attempt self-treatment, it typically also involves self-diagnosis (Home-remedies-for-you.com, 2014).

Modern medicine has become absorbed rapidly in to the local custom throughout the world, their ubiquitous distribution, powerful marketing and poor control mean that they are used and misused for a wide range of applications. Misuse is defined as using an over the counter drug product for a legitimate medical reason but in higher doses or for a longer period than recommended. For example, long term use of some drugs have been associated with chronic renal failure. Many earlier reports implicated phenacetin-containing analgesics as the risk factor. Since the early 1980s, several case-control studies have reported associations between chronic renal failure and use of other forms of analgesics, including paracetamol, aspirin, and other nonsteroidal anti-inflammatory drugs (NSAIDs) (Bennadi, 2014).

There are several critical issues involved before deciding if drugs should be authorized for self-medication. First and foremost, is the principle that no drug is absolutely safe - prescription drugs remain potent medications. In many countries, the possibility of reporting adverse drug reactions (ADR) to self-medication products is not available since many conventional ADR reporting schemes operate through health care professionals. Only in a small number of countries with highly developed ADR systems are patients and consumers able to report ADRs directly to the authorities or through pharmacies. Moreover, clinical trial data for prescription use may not necessarily be valid for self-medication. This situation is beginning to improve within some countries that now demand OTC-environment studies to be undertaken before registration (Apps.who.int, 2000).

In many countries, vaginal antifungal drugs have been released on over-the-counter (OTC) markets, yet little is known about women's management of their symptoms. In a study in this case, Physicians had observed several disadvantages of self-treatment, with unnecessary use and use for the wrong indications being the most often reported. In all, 31% of gynecologists and 16% of GPs reported that these adverse events had been clinically significant, with delay in the treatment of other infections being the most common problem (Sihvo et al., 2000).

Using pharmaceutical drugs to treat depression without the advice of a doctor might seem like a slightly safer route to go down, but it can still very much cause problems. Some antidepressants

such as forms of GABA are available over the counter or online and these can have mood enhancing effects. GABA for instance is a form of SSRI (selective serotonin re-uptake inhibitor) which essentially results in their being freer serotonin in the brain by preventing it from being reduced (it literally blocks the re-uptake). This results in a better mood because serotonin is one of the 'happiness hormones' that results in elevated mood. However, this on its own can cause side effects. For instance, it can result in the brain reacting by producing less serotonin in future and thereby lowering mood the rest of the time. Then the same dose of GABA will cause the brain only to return to normal levels of serotonin, and one would have to up the dosage to get the same improved mood (Sharif, Bugaighis and Sharif, 2015).

The risks from irresponsible use of self-medication are also worrying because of their implications on our health not just as individuals, but as a species as well. Our over reliance and almost abusive dependence on antibiotics for various conditions for example, has created a variety of drug resistant strains of bacteria. This poses a greater health risk than most of us can even fathom, as a global pandemic resulting from a drug resistant bacterial strain could prove disastrous (Home-remedies-for-you.com, 2015).

It is acknowledged that microbiological diagnostic tests will not be available to self-medicating patients, unlike to GPs. However, it is also known that few GPs take specimens from patients for whom they prescribe antibacterials. For example, in managing acute UTI it is common practice to treat empirically without taking a specimen. Misdiagnoses could have several adverse consequences.

These include:

- (i) the partial or complete failure to treat an infection (such as therapy for presumptive urinary tract infection (UTI) when the patient has a sexually transmitted disease)
- (ii) the failure accurately to identify or treat the presenting infection (such as otitis media complicated by meningitis)
- (iii) exposure to the risks of antibacterials without benefit when no treatable bacterial infection is present

(iv) possible increase in the number of patients receiving antimicrobials with consequent increase in the ecological pressure for resistance

(v) failure to recognize that an infection might be a manifestation of underlying disease (e.g. sepsis in diabetes mellitus) (Reeves et al., 1999).

Finally, according to the World Self Medication Industry (WSMI) while self-care through responsible self-medication can play an important role in the prevention of chronic diseases The unfortunate feature of self-medication in a good number of developing countries where good healthcare systems are absent or weak is self-prescription. Self-prescription, according to studies in parts of Asia and the American continent is a leading cause of antibiotic resistance, and this is similar to the findings in certain parts of Nigeria (Togoobaatar et al., 2010).

It is hard to strike a balance between self-medication that is necessary and the irresponsible use of medications and home remedies. Setting yourself strict deadlines can help address this problem to a great extent however. In other words, if you find that the ailment in focus does not respond to treatment within a deadline, you should seek immediate medical attention. The length of the deadline would naturally vary, depending on the severity of the symptoms or the severity of the condition they could be symptomatic of (Home-remedies-for-you.com, 2015).

1.8 Significance of self-medication

Self-medication is becoming an increasingly important area within healthcare. It moves patients towards greater independence in making decisions about management of minor illnesses, thereby promoting empowerment (Sherazi et al., 2012).

Self-medication makes consumers more health conscious, reduces treatment burden on healthcare facilities and curtails the cost and time of obtaining access to treatment. However, it increases risks such as drug resistance, adverse drug reactions, incorrect diagnosis, drug interactions and polypharmacy (Eticha and Mesfin, 2014).

A survey conducted for first-year medical students of the Arabian Gulf University, Bahrain (including some Saudi students) suggested that these students had a poor knowledge about

adequate self-medication whereas the knowledge of medication usefulness and harms was adequate. The attitude towards self-medication was positive and although the practice of self-medication was common, it was in most cases inadequate (Sharma et al., 2005).

Consumers are willing and able to take more responsibility for their own health and by so doing a significant amount of resources could be utilized in more pressing areas than patients receiving consultation and prescription for minor ailments. Consumer behavior research has shown that people want to take responsible self-medication, know what illness they could treat themselves, use medicine with caution and when to seek professional help (Tejashree, Sarala and Girish, 2014).

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 harmful. This agrees with a later study which showed that few, if any were consuming nutrient supplements in amount considered toxic and that most consumers used self-medication preparations in a safe and proper way. This agrees with other studies. Hence, in some patients, self-medication was recommended if they continue to have recurrences of a chronic infective process. Further, because OTC drug sales statistics reflects pattern of self-medication, it may be used to monitor the practice (Afolabi, 2012).

The increase in self-care is due to a number of factors. These factors include:

Socioeconomic factors

Growing empowerment, resulting from improved educational levels and greater access to information, combined with increased individual interest in personal health, is resulting in growing demand for direct participation in health care decisions (Fip.org, 2016).

Lifestyle

Awareness has increased of the impact of certain lifestyle factors -such as avoidance of smoking and keeping to a well-balanced diet -on maintaining health and preventing illness.

Accessibility

Consumers prefer the convenience of readily available of medicinal products to long waiting times at clinics or at other health facilities. In many countries, however, such availability may mean paying higher prices.

Management of acute, chronic and recurrent illnesses, and rehabilitation

It is now recognized that certain medically diagnosed conditions may be appropriately controlled by self-medication, or no medication at all. Indeed, in some countries this may a necessity rather than a choice.

Public health and environmental factors

Good hygiene practices and appropriate nutrition, safe water and sanitation have contributed to the capacity of individuals to establish and maintain their health, and prevent illness.

Demographic and epidemiological factors

Demographic transition towards a more elderly population is requiring changes in health policy and delivery. Likewise, epidemiological factors arising from changing disease patterns are necessitating adaptation of primary health care provision and funding. These changes and adaptations include enabling individuals to assume greater responsibility for their health care needs. This in turn means increasing individuals' capacity for self-care (James et al., 2006).

Health sector reforms

In the midst of declining economic activity and resources, governments and other third-party payers and individuals worldwide are grappling with escalating health care costs. Many countries are establishing mechanisms whereby these costs can be contained and health care made more cost-effective. Worldwide, self-medication is being promoted as a means of reducing the health care burden on the public budget. Structural changes including increased reliance on private sector delivery are also increasingly being put in place.

Availability of new products

New, more effective products, which are considered suitable for self-medication, have recently been developed. In addition, many long-established products with a good safety profile have been rescheduled as over-the-counter products; for example: topical and oral imidazole for vaginal candidiasis; topical fluorinated steroids for hay fever; acyclovir for cold sores; H-2 blockers for prevention of heartburn; H1 agonists for asthma. In other words, they will be available without prescription (Islam, 2006).

In a study of self-medication in India most of the respondents (39.2%) received the knowledge about the medicines for self-medication from their pharmacist or druggist. This finding was in accordance with the results of the study conducted in Bangladesh by Islam MS. in which majority (77%) of the respondents sought advice from chemist or druggist to take medicines for minor ailments. A total of 24.7% of the respondents used doctor's prescription for prior illness as a source of information for self-medication for similar ailment (Pahuja et al., 2011).

In a study of a cross sectional health survey conducted in the Rajshahi city, male (83.57%) tended to use more antibiotics than female which is concordance with the study conducted previously in Bangladesh but contrast in the study conducted in Lithuania. The high prevalence of self-medication was found within the adult participants (56.48%) which have correlation with the study conducted in Bangladesh and Arab Emirates (Biswas et al., 2014).

The present study in Mymensingh, Bangladesh highlights the problem of self-medication with antibiotics as OTC (Over the Counter) at Mymensingh Sadar area. both developed and developing countries, self-medication with antibiotics is common for illnesses (Begum et al., 2012).

Among the nonmedical students, several cases were found where drugs were being self-medicated in wrong indications, for example, use of Flupentixol, Melitracen and Domperidone to treat headache. The nonmedical students chose the fast acting drugs having the strongest effects for self-medication. The antipsychotics should have prescription-only status in Bangladesh. Mandatory counseling of each customer purchasing drugs from retail drug stores should be introduced (Chowdhury, Aysha and Haque, 2012).

The widespread and inappropriate use of antibiotics has resulted in the development of a progressively antibiotic-resistant microbial ecosystem in Bangladesh. A study among children from a rural community showed that 50% children had enteric flora resistant to Ampicillin, Cotrimoxazole and streptomycin throughout the year. One important finding that a medical practitioner can prescribe any drug used for the common cold to cancer. Moreover, polypharmacy is very common among the rural medical practitioners with antibiotics and vitamins prescribed widely. The prescription procedure of antibiotics in Bangladesh is less than ideal as prior identification of the pathogens and its sensitivity to the drug is rarely determined before the drug is prescribed. Currently, drug companies are the only organizations in Bangladesh. To provide information to health personnel and it is often not appropriate information. The excessive and inappropriate use of antibiotics adds an unnecessary economic burden to healthcare system and coincides with an increase in drug-resistant organisms, which has resulted in the use of more expensive and toxic drug (Faiz and Basher, 2011).

There was a positive correlation between the education level of the respondents and the tendency to obtain medications from the hospital/pharmacies in the study of Nigerian population. The prevalence among the illiterates was 7.5%, primary-30.6%, secondary-42.2% and postsecondary education-62.5%. In contrast, there was a negative correlation between the education level of the respondents and the tendency to obtain medications from patent medicine stores and local hawkers. For patent medicine stores, the prevalence was 75.0% of the illiterates, 53.1% of the primary, 46.7% of the secondary and 33.3% of the respondents with post-secondary education. For those who obtained their medications from the local hawkers, the prevalence was 17.5% of the illiterates, 16.3% of the primary, 11.1% of the secondary and 4.2% of the post-secondary educational level respondents. The association was statically significant (Afolabi, 2008).

It is high time to raise voice against self-medication and discourage self-medication. so the students, illiterate and mass people do not practice self-medication. Several study will help to get more knowledge about the self-medication behavior among people. The study can draw attention to our health authority and hope they will take right steps against self-medication practices among Bangladesh.

1.9 Self -Medication by Adults

Individuals sometimes self-administer medications through drug identification. Trade names were common means of identification and less frequently by generic name, action, color, shape and common usage names. A cross-sectional study was conducted to determine the extent and pattern of self-medication among adults, to identify their knowledge and practice concerning the purchased drugs and to calculate prescribing and purchaser care indicators. Following WHO methods, 35 pharmacies were randomly selected from districts in Alexandria city, Egypt. Of 1294 clients interviewed at these pharmacies, 1050 (81.1%) purchased self-medication; the commonest reason given was a belief that the condition was minor. The most frequently dispensed drugs were those for the respiratory system. The mean number of drugs per encounter was 1.10, mean cost LE 7.29 and mean dispensing time 2.53 minutes. Purchasers' knowledge and practice regarding the purchased drugs were poor (Sallam et al., 2009).

Any response to illness depends on the ability of patient or caregiver to recognize correctly that a problem, in the form of signs and symptoms, is occurring and to evaluate the seriousness of those indicators once recognized). Culture generally has been shown to influence recognition of illness and choice of care. For example, the designation of acute respiratory infection (ARI) as 'millet disease' in Uganda necessitates indigenous cures. In the case of diarrheal diseases, choice of type of western medicine may be based on the duration of illness. Choice of care depends on what options are actually available. In rural Zambia, for example, most caregivers have access to only one health facility and possibly one or two medicine shop (Afolabi, Brieger and Salako, 2004).

Many older adults independently manage their prescription and nonprescription (OTC) medications. Studies in the U.S. have shown that adults over 65 years are the largest users of prescription and OTC medications, accounting for up to 40% of all nonprescription medication use. Twice as many OTC drugs as prescription drugs were being used by older adults. Older adults are two to seven times more likely to experience an adverse drug reaction (ADR) than younger adults and approximately one third of hospital admissions of older adults are associated with a problem related to prescription medication use. In older adults, the chances of a serious drug reaction are increased because of altered pharmacokinetics, pharmacodynamics, impaired renal function, reduced hepatic blood flow and liver size, increased body fat, decreased lean body mass, changes in receptor sensitivity, and increased number of medical conditions. so the frequent use

of OTC drugs makes older adults even more vulnerable to the risks of concurrent or inappropriate medication consumption (Judith and Lydia, 2009).

Table 2: Disease that commonly adults suffers

Heart disease	Anemia
Chronic fever	Anxiety Disorders
Respiratory disease	Arthritis (including Osteoarthritis and Rheumatoid Arthritis)
Stroke	Asthma
Alzheimer's and others dementias	Chronic pain

Table 3: Drugs commonly used by adults

Analgesics	Antibiotics
Antihypertensive	Laxatives followed by Antacids
Sedatives	Cardiovascular medicine
Anxiolytics	Hypnotics
Antipsychotics	Vitamins

Table 4: Factors Influencing Adults to do self-medication

Lack of care	Lack of access
Lack of knowledge	Weak health systems
High cost of medication	Religious misconception
Extreme poverty	Using alternative medicines

People hold the view that medicine should be used in the event of any sickness or discomfort. In the UK where on the average 50% of health care takes place within the realm of self-medication. Self-medication trends in the elderly are certainly prevalent among the urban elderly. Older adults with multiple chronic conditions face the complex task of medication management involving multiple medications of varying doses at different times (Biswas et al., 2015).

1.10 Self Medication by children

Parents who self-medicate their children are more likely than adults who medicate themselves to say they do so because the illness isn't serious enough to warrant a visit to the doctor (88% parents of children under 18 versus 78% adults in general parents are also more likely than adults in general to believe that non-prescription medications are just as effective as prescription drugs (Jain, Malvi and Purviya, 2011).

The consumption of pharmaceuticals can be considered an indirect indicator of the quality of health care services and children and adolescents are strongly susceptible to the irrational use of drugs with and without medical control. In developing countries like Bangladesh due to poverty and insufficient knowledge of parents and children themselves perform irrational use of drugs (Pereira et al., 2007).

Analgesic, antipyretic, non-hormonal anti-inflammatory drugs followed by drugs with action on the respiratory tract and systemic antibiotics played an important role in the self-medication patterns and arise a big concern about the risks that some of these drug classes may produce in this context. The risks of non- hormonal anti-inflammatory drugs consumed by children are well documented. Antibiotics have a potential risk for public health and the widespread of multi resistance of antibiotics (Pfaffenbach, Tourinho and Bucarechi, 2010).

The use of herbal medicines for common childhood illnesses has been reported in Nigeria but its use in the management of colic has not been explored. About 85% of Nigerians are known to use and consult traditional medicine for healthcare, social and psychological benefits because of poverty and disillusionment with conventional medical care. Only a few of the herbal medicines in circulation in Nigeria are registered by the National Agency for Food and Drug Agency and

Control (NAFDAC). The importance of traditional medicine in Nigerian healthcare has been recognized by the national government who set up a high profile committee to develop, promote and commercialize traditional medicine products. Efforts have also been made by the government to preserve indigenous Nigerian medical knowledge by boosting research into traditional medicine (Oshikoya and Senbanjo, 2010).

Adolescents need to be reared with lot of patience, tact and affection even though maintaining discipline and setting limits on their behavior have their own role. Proper and early education regarding drugs will clear their misconceptions and myths regarding drugs abuse and lower their tendency towards experimenting new drugs on themselves. They will be enlightened about the systemic effects of drugs on body. School health program has not been much developed in India and school curriculum does not cater to the needs of imparting the knowledge of drugs of common use or commonly used drugs of minor ailments to any grade/class of students. Imparting knowledge about drugs will go in a long way to curb the menace of lying stealing, truancy and juvenile delinquency (Saini, 2010).

OTC medicines, among children were a point of interest among researchers particularly in the 1990s. Earlier studies indicate that the improvement of information sources concerning self-medication is needed, not only for OTC medicines, but for CAMs as well. Research shows that therapeutic errors do sometimes happen when medicines are administered for children at home. Usual errors are connected with the dose, such as giving double the dose that has been recommended. Parents were found to feel safe in using CAMs for their child in this study and earlier, and to sometimes use them especially if they are worried about the adverse effects of conventional medicines. In addition, according to a qualitative study, parents that had given CAM to their child had less knowledge about the possible harmful effects of CAM than the non-users of CAM (Sallam et al., 2009).

Table 5: Factors related to self-medication in children who perform self-medication (Moraes et al., 2011)

1. The great availability of products in the current days.
2. Quality of health care
3. Difficult access to health care services in poor countries
4. The state of health that a pharmaceutical agent may represent irresponsible publicity

Table 6: Drugs commonly used by children age from 0-14 years (Moraes et al., 2011)

Aspirin	Laxatives
Antacid	Local eye and skin treatment
Analgesics	Salbutamol
Anti-histamines	Non-steroidal topical anti-inflammatory agents
Cough suppressant	Vitamins or electrolyte supplements

1.11 Dangerous aspect of self-medication

It is very common in developing countries for people to developed distrust in going to doctors for treatment. This is not surprising considering the vast array of treatment which can be found at local facilities. It can vary from excellent to absolutely appalling. Educated people can easily fall into a bad habit in Africa of self-prescribing and self-treating; this is exacerbated by the ease at which they can get hold of prescription medications over the counter at the pharmacy without a prescription. This is an extremely dangerous practice. A large number of people when they fall ill don't consult a physician. They either consult a chemist and obtain medications or consult his friend or neighbor who may be having some medications left over from his previous illness. As people vary greatly in their sensitivity to drugs, and appropriate dose to one can be overdose to another and can lead to toxicity, a drug effective in one may cause allergy in other. While persons self-medicate, they won't consider this biological variability and other dangerous drug

interactions. Self-medication becomes harmful when some diseases unknown to the patient gets suppressed for the time being. Some drug doses can vary from time to time and taking drugs safe at one time may cause harm at another time for the same person (Goud, Kumar and K, 2014).

However inappropriate self-medication, may result in serious health hazards such as adverse drug reactions, drug dependence and increased resistance of pathogens. Self-Medication with antibiotics among students, termed, a silent epidemic. is a global problem. The consequences of inappropriate self-medication among healthcare professionals have severe implications including legal, ethical, health defects, negative impacts on patient and quality of health care delivery. Prior to any intervention for promoting rational antibiotic administration, it is prudent to determine the magnitude of SMA and the factors that contribute to this practice (Salve et al., 2015).

Many headache sufferers do not receive any preventive treatment even though they might benefit from. In addition, in the case of very frequent headache excessive self-administration over a period of time might cause the discomfort to worsen and increase in frequency, causing a state of chronic headaches, dependence on the analgesics and organic toxicity all of which can jeopardize the effect of prophylactic condition (Ferrari et al., 1996).

To our knowledge, the occurrence of insomnia and its self-medication with alcohol has not been investigated simultaneously in alcoholic groups (4–6). Nevertheless, other studies provide useful frequency estimates of self-medication. Study reported that 62% of treated alcoholics believed that alcohol helped them sleep. Likewise, another study found that 60% of 92 males in patients with alcoholism reported hypnotic use of alcohol. These self-medication rates are greater than rates reported for the general population (6% to 13%) and for people with initial insomnia (15% to 28%) Perhaps the highest rate of self-medication was reported for a group of 155 older women (85 or more years old) with symptomatic insomnia, of whom 70% used alcohol for sleep (Brower et al., 2001).

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 unfavorable reactions. 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 expense and drug interaction between prescription and non-prescription drug. The

prevalence of side effects was associated with lack of knowledge about the drug prior to its usage. 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. Chronic CQ toxicity was important in the causation of heart block in Africa, CQ retinopathy and abnormal ophthalmological findings, cardiac arrhythmia. Stevens Johnson syndrome following self-medication with Fansidar has been reported (Afolabi et.al.,2008).

It is seen more for common health worries; one may take a medicine as he feels soreness in his throat. But there might be another medicine that can help him recover fast from the problem. Thus he may waste his money and also delay his recovery. People suffering from anxiety and depression are more prone to taking drugs that are dangerous. This observation is alarming because it leads to addiction and you all know what effects drugs and alcohol have on the body. Potential dangers can also result from using wrong creams and lotions without the consultation of the doctor. The creams and lotions come loaded with harmful chemicals that can harm the skin if it is sensitive or unsuitable to that particular ointment (Sallam et al., 2009).

The dangers of self-medication include (Sawalha, 2008):

Misleading the illness:

A minor health issue which could be resolved easily with the doctor's advice may become a major problem over time. Symptoms may subside temporarily with self-medication but it would become difficult for a doctor to correctly diagnose and treat latter.

Habituation:

One could become addicted to prescription drugs such as antacids, cough syrups and pain relievers.

Allergic Reaction:

Some antibiotics such as penicillin or sulpha drugs can cause severe reactions in the body for some people. This could be fatal.

Insufficient dosage:

Incorrect dosage of medicines will not cure and will prolong recovery. On the other hand, over dosage may damage liver, kidneys and other organs. Indiscriminate use of antibiotics: these could over a long time lead to microbial resistance. Consequently, the antibiotic may become ineffective when taken in the future.

Risk of stroke:

The most commonly misused medicines are painkillers. Analgesics can induce gastritis and can also increase risk of stroke by four times in patients in high blood pressure.

Drug interactions:

Some herbal drugs and medicines may cause drug to drug interactions and adversely affect the body.

Self-medication by pregnant women

This could adversely affect the unborn child causing congenital anomalies and birth defects. Unlike other factors of self-care, self-medication involves the intake of drugs, which have the potential to be beneficial or harmful. Their improper use can have serious health implications, especially among children, the aged and in people with special physiological conditions such as pregnancy and lactation. The government and health authorities must ensure that only safe drugs are made available OTC. Consumers should be given adequate information about their safe use.

1.12 Role of Pharmacist to stop self-medication

In most countries pharmacies are conveniently accessible and, in them, pharmacists are available for a considerable period during each working day and no appointment to see them is necessary. In countries where pharmacies are not well distributed, the aim of governments should be to ensure that the vast majority of the public have convenient access to a pharmacy. Pharmacists have a professional responsibility to provide sound, unbiased advice and to ensure that self-medication is resorted to only when it is safe and appropriate to do so. Pharmacists have the necessary

knowledge to advise on safe storage of medicines in the home and on safe disposal of medicines once a course of treatment has been completed or, in the case of a medicine, which is obtained for occasional use, when the expiry date has been reached. Pharmacists can also advise that medicines prescribed for one individual or purchased for the treatment of a specific medical condition should not be used by another person without professional advice first being sought (International Pharmaceutical Federation, 1996).

Pharmacy Act 2007 requires that the supply of medicines be from a pharmacy under personal supervision of a pharmacist. Pivotal role of the pharmacist to ensure and facilitate appropriate medicines utilisation. Legislative requirements under SI 488 of 2008 that when supply occurs that information and advice be provided. Robust regulatory framework provides for opportunity to develop pharmacy services. PI2020 looking at evolving roles in respect of ensuring health, MUR, medicines management, screening Evidence supportive that the development and promotion of self-care is of value for the patient, and value for public health (You et al., 2011).

Medication compliance is one of the important elements in self-care. It is common for patients to use over-the-counter (OTC) medicines without the supervision of healthcare professionals, which can limit the opportunity for ongoing patient follow-up and safety monitoring. The establishment of a robust pharmacovigilance system is therefore advocated, in which pharmacists play an important role in providing advice to patients when they purchase OTC drugs. In the UK, there is also a move to promote the role of pharmacists and develop a broader concept of the primary care team. Pharmacist's role has been extended to tobacco cessation therapy, local health promotion, advice to family doctors and other health professionals, repeated prescription, advice to nursing and residential homes, health screening and diagnosis, etc. Meanwhile, general practitioners have also become more supportive of pharmacists' extended role in western countries (Salve et al., 2015).

The evolution of the Hong Kong healthcare system and the health policy might explain why Hong Kong people have a low acceptance rate on pharmacist-led self-care management. In Hong Kong, patients receive health services from either private or public sectors seldom have the opportunity to consult community pharmacists as patients usually receive prescribed medications from private doctors directly or from government clinic pharmacies. Community pharmacists would only have the chance to provide consultation when patients visited them to buy drugs over the counter.

Patients, therefore, are not familiar with the role of pharmacists besides dispensing drugs and not very supportive of pharmacist-led self-care management (You et al., 2011).

Role of a pharmacist can be (Sawalha, 2008):

As a communicator

- The pharmacist should initiate dialogue with the patient (and the patient's physician, when necessary) to obtain a sufficiently detailed medication history;
- In order to address the condition of the patient appropriately the pharmacist must ask the patient key questions and pass on relevant information to him or her (e.g. how to take the medicines and how to deal with safety issues);
- The pharmacist must be prepared and adequately equipped to perform a proper screening for specific conditions and diseases, without interfering with the prescriber's authority;
- The pharmacist must provide objective information about medicines;
- The pharmacist must be able to use and interpret additional sources of information to satisfy the needs of the patient;
- The pharmacist should be able to help the patient undertake appropriate and responsible self - medication or, when necessary, refer the patient for medical advice;
- The pharmacist must ensure confidentiality concerning details of the patient's condition.

As a quality drug supplier

- The pharmacist must ensure that the products he/she purchases are from reputable sources and of good quality;
- The pharmacist must ensure the proper storage of these products.

As a trainer and supervisor

To ensure up-to-date quality service, the pharmacist must be encouraged to participate in continuing professional development activities such as continuing education. The pharmacist is often assisted by non-pharmacist staff and must ensure that the services rendered by these auxiliaries correspond to established standards of practice.

To achieve this the pharmacist must develop:

- Protocols for referral to the pharmacist;
- Protocols for community health workers involved with the handling and distribution of medicines. The pharmacist must also promote the training and supervise the work of non-pharmacist staff.

As a collaborator

It is imperative that pharmacists develop quality collaborative relationships with:

- Other health care professionals;
- National professional associations;
- The pharmaceutical industry;
- Governments (local/national) and,
- Patients and the general public.

In so doing, opportunities to tap into resources and expertise, and to share data and experiences, in order to improve self - care and self-medication, will be enhanced.

As a health promoter

As a member of the health-care team, the pharmacist must:

- Participate in health screening to identify health problems and those at risk in the community;

- Participate in health promotion campaigns to raise awareness of health issues and disease prevention; and
- Provide advice to individuals to help them make informed health choices

Specific situations

In many developing countries, the ratios of pharmacists and pharmacies to population are so low that access to pharmaceutical care is impeded. In such cases, consultation with other health workers or community health care workers, household carers and other appropriate lay people, provided they have received the appropriate pharmaceutical training and orientation, should be encouraged (Brower et al., 2001).

The majority of respondents supported self-care for chronic diseases. However less than half supported pharmacist-led self-care programs despite the fact that elderly people and those with lower education level and a chronic condition were at high risk of encountering problems with OTC products. To overcome these limitations, self-care programs provided by pharmacists should be gradually developed with the support of the Government (You et.al.,2011).

1.13 Common disease in children in where self-medicated has been done

Asthma

Asthma (AZ-ma) is a chronic (long-term) lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning.

Asthma affects people of all ages, but it most often starts during childhood. In the United States, more than 25 million people are known to have asthma. About 7 million of these people are children (Nhlbi.nih.gov, 2014).

Pathophysiology of asthma

Asthma has many known "triggers," including physical exertion, allergens, medications, occupational infection, emotions and stress. In response to contact with a triggering substance or mechanism, mast cells of the immune system, which are found in loose connective tissue, are responsible for releasing vasoactive (action on vessels) chemical mediators, including histamine, bradykinin, leukotrienes, cytokines and prostaglandins. Chemotactic (produces specific cell movement) chemical mediators released from the mast cells cause neutrophils, lymphocytes and eosinophils to infiltrate the cells of the bronchial lining. These target the respiratory system and cause bronchoconstriction, vascular congestion, vasodilation, increases in capillary permeability, mucosal edema, impaired mucociliary action (removal of mucus and contaminants within the bronchial tree by movement of the cilia inside the bronchioles), and increased mucus production, which leads to an increase in airway resistance. Mucus plugging may also occur in the smaller bronchioles. These pathophysiologic factors produce the typical clinical presentation of asthma, including wheezing and respiratory distress (Daniel et al., 2004).

Treatment of asthma

Asthma is treated with two types of medicines: long-term control and quick-relief medicines. Long-term control medicines help reduce airway inflammation and prevent asthma symptoms. Quick-relief, or "rescue," medicines relieve asthma symptoms that may flare up.

Long-Term Control Medicines for asthma

Inhaled corticosteroids reduce inflammation and helps to prevent the chain reaction that causes asthma symptoms.

Side effects

A mouth-infection called thrush.

If taken for long periods, these medicines raise the risk for cataracts and osteoporosis (Nhlbi.nih.gov, 2014)

Omalizumab

A recombinant DNA-derived humanized monoclonal antibody, binds to the Cε3 domain of IgE and forms complexes that inhibit the immune system's response to allergens by averting IgE mediated inflammatory changes. In the airways of patients with allergic asthma, FcεRI+ and IgE+ cells and causes a profound reduction in tissue eosinophilia, together with reductions in submucosal T-cell and B-cell numbers. The reductions in circulating levels of IgE resulting from omalizumab treatment leads to reductions in FcεRI expression on mast cells, basophils and dendritic cells. This combined effect results in attenuation of several markers of inflammation, including peripheral and bronchial tissue eosinophilia, levels of GM-CSF, IL-2, IL4, IL5 and IL13. It may also reduce allergen presentation to T-cells and the production of Th2 cytokines (Mohamed, 2007).

Side Effects

Life-threatening allergic reaction called anaphylaxis might occur.

Leukotriene Modifiers (Zafirlukast, Montelukast, Zileuton)

These medicines are taken by mouth. They help block the chain reaction that increases inflammation in airways.

Side effect (Nhlbi.nih.gov, 2014)

Skin rash	Pain
Bruising	Muscle weakness
Severe tingling	Anxiety
Numbness	Depression

Theophylline

Theophylline helps open the airways.

Side effects

Chest pain or discomfort

Fast, slow, or irregular heartbeat

Dizziness

Increase in urine volume

Quick-Relief Medicines for asthma

Inhaled short-acting beta2-agonists (Albuterol, Levalbuterol, Metaproterenol).

These medicines act quickly to relax tight muscles around your airways when you're having a flare up. This allows the airways to open up so air can flow through them.

Side effects (Mohamed, 2007)

Palpitation

Skin rash

Headache

Nausea

Vomiting

Common Cold

The common cold, also known as rhino pharyngitis, is a type of respiratory tract infection caused by a virus. On average, adults have approximately three respiratory infections each year, but children are more commonly affected with up to 12 cold a year for children attending school. There is a higher incidence of colds in autumn (fall) and winter, as it is a season infection, although people may be affected at any time throughout the year (Smith, 2009).

Pathophysiology of common cold

A cold virus is deposited into the front of the nasal passages by contaminated fingers or by droplets from coughs and sneezes. Small doses of virus (1-30 particles) are sufficient to produce infection.

The virus is then transported to the back of the nose and onto the adenoid area by the nose itself. The virus then attaches to a receptor (ICAM-1) which is located on the surface of nasal cells. The receptor fits into a docking port on the surface of the virus. Large amounts of virus receptor are present on cells of the adenoid. After attachment to the receptor, virus is taken into the cell where it starts an infection. New virus particles are produced in the infected cell. The infected cell eventually dies and ruptures, releasing newly made cold virus to infect other cells in the nose and start the process over again. The virus is much smaller than the cell. Cold symptoms are due mainly to the body's response to the infection. When a nasal cell is infected by a cold virus, the body responds by activating parts of the immune system and some nervous system reflexes. The immune system contains a variety of natural substances called inflammatory mediators. When activated by a cold virus infection, inflammatory mediators cause dilatation and leakage of blood vessels and mucus gland secretion. Inflammatory mediators also activate sneeze and cough reflexes and stimulate pain nerve fibers. These events are what lead to the symptoms of a cold (Jozwiak-Bebenista and Nowak, 2014).

Treatment of common cold

Treatment has two goals: to make you feel better and to help you fight off the virus.

Paracetamol (Acetaminophen)

The primary mechanism of action is believed to be inhibition of cyclooxygenase (COX), with a predominant effect on COX-2. Inhibition of COX enzymes prevents the metabolism of arachidonic acid to prostaglandin H₂, an unstable intermediate byproduct which is converted to pro-inflammatory compounds. In the central nervous system, inhibition of COX enzymes reduces concentrations of prostaglandin E₂, which lowers the hypothalamic set-point to reduce fever, and activation of descending inhibitory serotonergic pathways to produce analgesia (Jozwiak-Bebenista and Nowak, 2014).

Side effects

- | | |
|---------------------|------------------|
| Skin rash | Hives or Itching |
| Yellow eyes or skin | Cloudy urine |

Overdoses causes

Diarrhea

Loss of appetite

Increased sweating

Nausea or vomiting

Respiratory Bronchitis

Bronchitis is a respiratory disease in which the mucus membrane in the lungs' bronchial passages becomes inflamed which carry air to and from lungs. People who have bronchitis often cough up thickened mucus. Bronchitis may be either acute or chronic.

Pathophysiology of Respiratory Bronchitis

RSV infection is limited to the respiratory tract. Initial infection in young infants or children frequently involves the lower respiratory tract and most often manifests as the clinical entity of bronchiolitis. Inoculation of the virus occurs in respiratory epithelial cells of the upper respiratory tract. Spread of the virus down the respiratory tract occurs through cell-to-cell transfer of the virus along intracytoplasmic bridges (syncytia) from the upper to the lower respiratory tract.

Treatment of Respiratory Bronchitis

Ribavirin

The ability of ribavirin to inhibit respiratory syncytial virus (RSV) particle release and *RSV* gene expression by infected airway epithelial cells was found to be associated with reductions in IL-8 secretion, IL-8 mRNA expression, and nuclear factor-kappa B (NF- κ B) activation. Using microarrays, ribavirin was shown to inhibit expression of the RSV-inducible chemokines MIP-1 α and MIP-1 β and interferon, to up-regulate expression of RSV- and interferon-stimulated response genes, and to increase RSV-induced STAT-1 binding to the interferon-stimulated response element encoding antiviral proteins, suggesting that ribavirin potentiates interferon-stimulated response element signaling induced by RSV, thus enhancing the expression of antiviral interferon-stimulated response gene (Thomas et.al., 2012).

Side effects:

Anxiety, Black, tarry stools,	Body aches or pain, chest pain,
Congestion,	Diarrhea,
Sleeplessness,	Nausea & vomiting.

1.14 Safe dosage of drug

Safety is a major concern when the FDA considers reclassifying the prescription drugs as OTC. Most OTC drugs unlike health foods, dietary supplements (including herbs) and complimentary therapies have been studied scientifically and extensively. However, all drugs have benefits and risks and some degree of risk has to be tolerated if people are to receive a drug's benefits.

Safety depends on using a drug properly. For OTC drugs proper use often relies on consumer self-diagnosis, which leaves room for error. People who purchase OTC drugs should read instruction carefully because different formulation such as immediate release and control release (slow release) formulation may have the same brand name, the label should be checked is time a product is purchased and the dosage should be noted (Bhagavath et.al,2010).

Safety in self-medication (an overriding requirement) depends on four parameters

1. Drug: Its inherent properties, dose and duration of use, including its power to induce dependence.
2. Formulation: devised with unsupervised use in mind, e.g. low dose.
3. Information: available with all purchases (printed) and rigorously reviewed (by panels of potential users) for user friendliness and adequacy for a wide range of education and intellectual capacity.
4. Patient compliance (Jain et.al., 2011).

1.15 Condition treated by self-medication

There is a wide variety of conditions, given in figure. In which OTC drugs are used. Most commonly available OTC medications are pain killers, cough and cold remedies, anti-allergy medicines, vitamins and energy tonics. 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 unfavorable reactions. Generally, Consumers tend to utilize private pharmacies rather than public facilities for self-medication. (Goel et al., 1996).

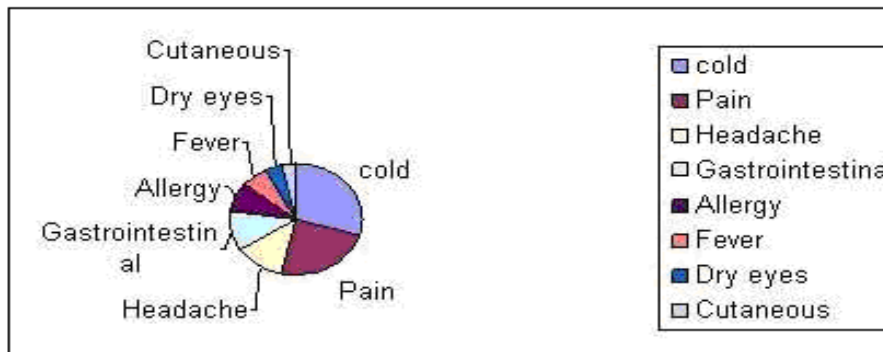


Figure 1: Patient preferences for OTC drugs patient preferences for OTC drug (Afolabi et.al., 2008).

1.16 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 sufferer. 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 effects.

For instance, cocaine acts directly on the “pleasure centers” 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 dependence (Afolabi et.al., 2008).

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 it. Approximately, 30% of women from a study conducted in the United States, smoke cigarette during pregnancy despite its deleterious effect on the mother and fetus. The beverage, alcohol (ethanol) was so commonly consumed that it is seldom 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 states. It may also be used to cope with perceived problem of sexuality (Jogdand, Pahlake and Nandal, 2013).

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 purposes. However, not all cases of drug dependencies follow this hypothesis because there are traits or symptoms which separate various groups of drug dependent individuals. As a result, Khantzian 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 self-medicate for their disorders by using illicit substances (Sherazi et al., 2012).

1.17 Self-medication and Antibiotic or Antimicrobial resistance

Antibiotic resistance occurs when an antibiotic has lost its ability to effectively control or kill bacterial growth; in other words, the bacteria are "resistant" and continue to multiply in the presence of therapeutic levels of an antibiotic.

With the discovery of antimicrobials in the 1940s, scientists prophesied the defeat of infectious diseases that had plagued humankind throughout history. However, the remarkable healing power of antibiotics invites widespread and often inappropriate use. This misuse and overuse of

antibiotics leads to antibiotic resistance among bacteria and consequent treatment complications (Tufts.edu, 2016).

A major problem with self-medication with antibiotics/ antimicrobials is the emergence of drug resistance. Antimicrobial resistance is a current problem world-wide; particularly in developing countries. It is widely believed that human malpractices such as inadequate dosing, incomplete courses and indiscriminate drug use have contributed to the emergence and spread of antimicrobial resistance. The consequence of this is the loss of relatively cheap drugs that will require new drugs development, which will be more expensive and will further disadvantage patients in developing countries such as Sudan. The rational use of antibiotics is thus of utmost importance to limit the increase in bacterial resistance (Awad et al., 2005).

The determinants of self-medication with antibiotics in low-income countries include over-the-counter sale of antibiotics, the cost of medical consultation, low satisfaction with medical practitioners, and misconceptions regarding the efficacy of antibiotics. Studies in the USA showed that recent immigrants from Latin American countries, where antibiotics are available over-the-counter, had the greatest expectations for antibiotics for upper respiratory infections. The cultural beliefs and a lack of health insurance were other possible determinants of self-medication with antibiotics for these immigrants (Grigoryan et al., 2007).

Antibiotic resistance is an international pandemic that compromises the treatment of all infectious diseases. At the present time, resistance essentially is uncontrollable. The reasons behind the establishment and spread of resistance are complex, mostly multi-factorial, and mostly unknown. Resistance is often portrayed as simply an undesirable consequence of antibiotic abuse or misuse, but the rate of antibiotic resistance emergence is related to all uses of drugs, not just misuse, and the total amount of antibiotics used and the environment also play roles. The main driving factor behind resistance may actually be a lack of adequate hygiene and sanitation, which enables rapid proliferation and spread of pathogen (Bhagavath et al., 2010).

Antimicrobials are the most commonly prescribed group of drugs in general practice and in hospitals. Despite the improved trend of health care in Bangladesh, infectious diseases remain priority public health problem, where widespread use of different antimicrobials against bacterial, fungal, viral and parasitic infections is required. Most antimicrobials are prescribed, with the

decision to apply based on best-guess empiric therapy. A majority of the prescribers in Bangladesh diagnose infection by clinical assessment and suspect a microbial etiology (Faiz and Basher, 2011).

Table 7: Antibiotic resistant pathogens in Bangladesh

<i>Salmonella typhi</i>	<i>Streptococcus pneumoniae</i>
<i>S typhimurium</i>	<i>Plasmodium species</i>
<i>Shigella dysenteriae type 1</i>	<i>Nosocomial pathogens</i>
<i>Neisseria gonorrhoeae</i>	<i>Pseudomonas spp.</i>
<i>Staphylococcus species</i>	<i>Acinetobacter spp.</i>
<i>Enterococcus species</i>	<i>Klebsiella spp.</i>
<i>Mycobacterium tuberculosis</i>	

In Bangladesh, misuse and waste of antibiotics appear to be frequent. Over the-counter availability of all types of *Plasmodium SI* antibiotics makes the situation worse. Antibiotic prescribing by the physicians appears to be less than ideal. The widespread and inappropriate use of antibiotic results in the development of a progressively antibiotic-resistant microbial ecosystem in Bangladesh (Rahman and Rahman, 1998).

1.18 Process to discourage self-medication

According to WHO guidelines responsible self-medication can help prevent and treat diseases that do not require medical consultation and reduce the increasing pressure on medical services for relief of minor ailments especially when resources are limited. Otherwise self-medication if not based on authentic medical information can lead to irrational use of drugs, wastage of resources, and increased resistance of pathogens and can lead to serious health hazards such as adverse drug reaction and prolonged morbidity. Not much is known about health related problems and healthcare utilization, including self-medication among young adults. The youth are highly influenced by the media and the internet which promote self-medication behavior. The increased advertising of pharmaceuticals poses a larger threat of self-medication to the younger population

in general. This raises concerns of incorrect self-diagnosis, drug interaction, and use of drugs other than for the original indication (Bhuvana and Patil, 2015).

In developing countries, such as Papua New Guinea (PNG), self-medication may pose a threat to public health unless the population is adequately educated on responsible self-medications, so as to avoid problems associated with irrational medicine use. PNG has a fair share of Health Service problems, with reports indicating that anti-malarial medicine resistance and resistance to some antibiotics are on the increase (Meaurio, Temple and Lauwo, 2011).

Strict measures are needed to monitor advertisements of medicines both in print and electronic media. The possibility of having access to medicines not listed as OTC drugs should be minimized by taking appropriate monitoring measures including implementing effective legislation. There is also a need to explore the possibility of developing partnerships between physicians, pharmacists and consumers to educate and disseminate information on self-medication. so that threats can be minimized. Medication should be taken on the advice of a doctor or a trained health professional. Proper drug control is very important. Drug should not be dispensed without prescriptions. There should be proper maintenance of records of dangerous drugs, by shop selling medicines. Drugs inspectors should be more vigilant in checking these pharmacists. Sometimes antibiotics are given only for a one or two days. There should be some restrictions on over the counter drugs (Hussain and Khanum, 2008).

Mixing drugs can have an unpredictable effect, as it is difficult to predict how the drugs will interact. When dropping off a new prescription at the pharmacy, patients should ask about drug interactions. It's also a good idea for patients to use the same pharmacy for all of their prescriptions so that interactions will be spotted more easily in the computer system. Patients also can take charge of their health by using an online tool to check interactions each time they are prescribed a new drug, they buy an OTC medicine or they pick up a dietary supplement (Bhuvana and Patil, 2015).

2. Literature Review

2.1 Parental Self Medication of Antibiotics for Children in Bagdad City

Jasim et al (2014) designed a study as the cross sectional descriptive study in which the data was collected via direct interviews with the parents using previously prepared questionnaires. A total of 124 parents with the practice of self-medication for their children were included. The majority of children were 1-6 years old and male children were slightly more than females. The main reason of self-medication was dealing with same current ailments previously followed by considering the current illness as mild one. The major sources of information about self-medicated antibiotics were previous prescription and community pharmacists. The most frequent source of antibiotics was the community pharmacies. Upper respiratory tract conditions were the commonest indication for self-medication. Amoxicillin was found to be the most frequently acquired and utilized antibiotic in this study (Jasim, 2014).

2.2 Association between parental attitudes and self-medication of their children

Siponen et al., (2012) conducted a study to identify how parental attitudes toward medicines are associated with how they medicate their children with self-medication including the use of over-the-counter (OTC) medicines and complementary and alternative medicines (CAMs). Setting A cross-sectional population-based study was conducted in the spring of 2007. The study sample consisted of a random sample of Finnish children under 12 years of age (n = 6,000). Method A questionnaire was sent to parents, and the parent who usually takes responsibility for the child's medication was instructed to answer the questionnaire. Main outcome measure the responding parent was asked to report the child's use of OTC medicines and CAMs during the preceding 2 days. The parent's attitude toward medicines was measured by 18 statements using a 5-item Likert scale. Results CAM use was least likely among children whose parent had a positive view of prescription medicines. In contrast, a positive attitude toward OTC medicines by a parent was associated with both, OTC medicine and CAM use among children, whereas, parental worry about the risks of medicines predicted the use of CAMs among children. Conclusion This study showed

that parental attitudes toward medicines have an impact on how they medicate their children, especially with CAMs. This finding highlights the fact that health care professionals should negotiate a child's treatment, taking into account parental views toward medicines, and previous use of self-medication (Siponen et al., 2012).

2.3 Drug use and self-medication among children with respiratory illness or diarrhea in a rural district in Vietnam: a qualitative study

A qualitative study was conducted, using in-depth interviews with two drug sellers and three health care providers, and four focus-group discussions with mothers of children under 5 years of age. Verbatim transcriptions were analyzed, and emerging themes and categories identified, using content analysis. Use of a number of different drugs was reported, including broad-spectrum antibiotics and corticosteroids. There was poor awareness of side-effects, antibiotic resistance, and drug efficacy. Factors influencing self-medication were perceptions of the illness in the child, waiting time, and convenience, the attitudes of public health medical staff, insufficient drug supply in public health facilities, and poor control of prescribed drugs on the market. Misuse and misconceptions regarding drug use gave rise to considerable problems. Mothers' knowledge and attitudes to illness and health care services played an important role in determining the nature of self-medication. Financial barriers were not the only obstacle to adequate treatment. Health services should be more accessible and responsive to the needs of the population (Hoan Le et al., 2011).

2.4 Self-medication for infants with colic in Lagos, Nigeria

It is a prospective study conducted at the vaccination clinics of 20 primary health care centers, each from different Local Government Areas in Lagos, Nigeria. Eight hundred mothers that brought their infants for vaccination between April and September, 2006 were interviewed with open-and close-ended questionnaire. Six hundred and eighty-three (85.4%) mothers claimed they had a good knowledge of colic. Incessant and excessive cry was the main clinical feature of colic identified by 430(62.9%) mothers. Three hundred and seventy-eight (67.7%) infants were treated

by self-medication, 157 (28.1%) sought medical intervention and 17 (3.1%) were treated at a traditional birth attendant home. Herbal medicines constituted 51.8% of the self-medicated medicines, of which 48 (26.2%) were "Ororo Ogiri". Nospamin[®] (49.5%) and Gripe water[®] (43.0%) were the two frequently prescribed and self-medicated medicines for infants with colic (Oshikoya, Senbanjo and Njokanma, 2009).

2.5 Self-medication with Antibiotic in Children in Sana'a City, Yemen

This is a descriptive study conducted in the outpatient department of Sam hospital Sana'a city Yemen, during a five months' period from December 2007 to April 2008. 2000 patients (1110 males and 890 females) were seen for different causes during that period. All patients were asked if they used antibiotics in the last 15 days without medical prescription, what type of antibiotic, why and how they obtained it. The age and sex of the patients were also recorded. The age group of the patients ranged from 0-15 years. Of the 2000 patients interviewed, 1200(60%) had taken an antibiotic in the last 15 days without a medical prescription. Respiratory (80%) and gastrointestinal (13%) symptoms were most frequently reported. 312(26%) patients used the previous prescription paper to obtain antibiotics, while 888(74%) obtained antibiotics from pharmacies and drug stores without any prescription required. Amoxicillin, Trimethoprim sulfamethoxazole and amoxicillin-clavulanic acid accounted for (85%) of the prescribed antibiotics (Mohanna, 2010).

2.6 Mothers' understanding of childhood malaria and practices in rural communities of Ise Orun, Nigeria: implications for malaria control

A community-based cross-sectional study at rural communities of Ise-Orun local Government area, Nigeria. We randomly sampled 422 mothers of children less than 5 years and administered a validated questionnaire to assess their perceptions and practices relating to childhood malaria. We used a 10-point scale to assess perception and classified it as good (≥ 5) or poor (< 5). Predictive factors for poor perceptions were identified using logistic regression. Approximately 51% of the mothers had poor perception and 14.2% ascribed malaria illness to mosquito bite only. Majority (85.8%) of the mothers practiced malaria preventive measures, including: Insecticide treated nets

(70.0%), chemoprophylaxis (20.1%) and environmental sanitation (44.8%). Of the 200 mothers whose children had malaria fever within the 3 months prior to the study visits, home treatment was adopted by 87.5%. Local herbal remedies were combined with orthodox medicine in the treatments of malaria for 91.5% of the children. The main reasons for not seeking medical treatment at existing formal health facilities were "high cost", "challenges of access to facilities" and "mothers' preference for herbal remedies". Lack of formal education was the only independent predictor of poor malaria perceptions among mothers (Orimadegun and Ilesanmi, 2015).

2.7 Management of Childhood Febrile Illness Prior to Clinic Attendance in Urban Nigeria

A year-long study was conducted among 1,943 sick children and their caregivers who attended the largest government-owned pediatric hospital in Lagos, Nigeria. The major complaints mentioned by the caregivers included fever, cough, and diarrhea. Most (89%) caregivers had administered some form of medicine to the child prior to the clinic visit, and on average, 2.5 medications had been given. Associations were found between major complaint and type of medicine given: fevers were associated with antimalarial drugs and analgesics (antipyretics), cough was associated with cough syrup and analgesics, while diarrhea was associated with antidiarrheal drugs. Although one-fifth of the children had received an antibiotic, provision of antibiotics was not associated with a particular complaint/illness. Since caregivers appeared to use perceived complaints/illnesses as a treatment guide, this can form the basis of safer and more appropriate recognition of illness and home management. In addition, the information obtained in this study can be used for training clinicians to inquire about home management and, thus, for making more informed decisions about their own treatment and prescribing practices (Afolabi, Brieger and Salako, 2004).

3. Methodology

3.1. Study subjects:

We carried out a systematic exploration of the prevalence of practices of self-medication among the children of Dhaka city. The age group of children was 0-12 years. This age was divided into four groups in the questionnaire for the convenience of survey.

3.2. Study design:

This study involved a simple questionnaire based survey. The question was divided into three segment and total 36 questions were contained in the questions. The questions were filled by the parents of the children. It was included all class of people from the highly income parents to lower income parents and their education level to correlate their self-medication on the basis of this things. The target was the children of Dhaka City.

3.3. Study period:

The study was conducted from November 2015 to January 2016. To complete the study in time, a work schedule was prepared depending on the different task of the study. One month was spent for selection of topic, development of protocol and related writings. Four months were spent on official correspondence, data collection, data analysis, report writing and submission of report.

3.4. Place of the study:

The study was conducted in some residential areas of Dhaka city (South zone). Those places were Sabujbag, Bashaboo, Mayakanon, Mugdapara and Manda.

3.5. Study population:

The parents of children of Dhaka were considered as study population of my study.

3.6. Sample size:

There were 128 parents of children who participate the survey. The question was filled up by father or mother of child.

3.7. Sampling technique:

In this study random sampling was followed.

3.8. Data collection instrument:

Data was collected by the researcher herself using a pre structured questionnaire.

3.9. Data Analysis:

After collection of data it was checked by the researcher for completeness or any discontinuation. After completion of checking, data were entered into Microsoft Excel, software in a computer for analysis in the line of objectives. Then the data were presented in diagrams and tables.

3.10. Key variables with operational definition:

- a) Age: Age is recorded in year as stated by the participants.
- b) Study: Study of the participant means the academic discipline whether he/ she studied in primary, secondary or higher education level or not.
- c) Occupation: It means that what is the profession of father or mother of that child.
- d) Monthly family income: Monthly income means income of the parents/guardians.

QUESTIONNAIRE

(All the questions asked are used for research purpose only and all the information is kept confidential)

Place of Interview: _____ Date of Survey: _____

Place a tick (✓) on your choice of answer

DEMOGRAPHIC INFORMATION

1. Parent filling up the questionnaire: Father Mother Others _____
2. Education level: Primary school School certificate (class 10 equivalent) High school (class 12 equivalent) Non-university diploma Bachelors (university) Post graduate (university)
3. Occupation: Studying Homemaker Healthcare professional Unemployed Others _____
4. Net household income (BDT): < Tk. 5000 Tk. 5000-10,000 Tk. 10,000-30,000 Tk. 30,000 <
5. Number of child in the family: 1 2 3 Others _____
6. Have you ever taken a degree in health care? Yes No
7. Age of child (who is medicated): < 3 months 3 months- 1 yr. 1-5 yr. 5-12 yr.
8. Gender of child: Male Female
9. Child (who is medicated) is: 1st born 2nd born 3rd born Others _____

CHILD'S DISEASE AND MEDICATION USAGE INFORMATION:

10. Did the child suffer from any disease, disorder or injury in the past 6 months that required use of medication? Yes No

11. What was the nature of the child's disease, disorder or injury? Respiratory (asthma/cough/others_____) Gastrointestinal (diarrhea, constipation, others_____) Fever Common cold Dermatological Others_____

12. What was your opinion about the health status of the child? good fairly good moderate fairly poor poor

PARENTAL PERCEPTION AND UNDERSTANDING OF DRUG USE

13. How did you respond when your child suffered from the disease, disorder or injury? consulted a doctor and medicated according to prescription consulted a non-prescribing health care professional waited until the disease, disorder or injury relieved itself self-medicated

Answer question 14 to 17 ONLY if you have self-medicated your child with any drug.

14. Do you think self-medicating your child is safer than receiving medications upon consult? Yes No

15. What were your reasons for self-medicating your child?

- Considered ailment as minor, not requiring physician's consult Self-decision by parents
- Previous treatment by physician was unsuccessful Long waiting time to avail the doctor
- Asked doctor for a medication, but he refused to prescribe Shortage of drug supply in stores
- Previous prescription as reference for same illness High cost of treatment in private clinics
- Taking the child along is inconvenient Lack of nearby health care provider
- Problems with behavior/attitude of medical staff (scolding/ indifference)
- Others: _____

16. Name the drug(s) you self-medicated to your child? _____

17. What was the treatment schedule of the drug you gave to your child? Mention the doses and dosing intervals. _____

18. Are you aware of the side effects of the drug your child is given? Yes No

19. Did you learn about the drugs before administering it to your child? Yes No

20. Where did you obtain information regarding the drugs? Health care professionals Drug sellers
 Family and friends Media (TV/radio/newspaper etc.) Patient information leaflet or package insert
 Others _____

21. Where did you get the medications from when you self-medicated your child? OTC from dispensaries
 Health care professionals other than relevant doctor Friends and family Family medicine cabinet
 Others _____

Answer question 22 to 25 ONLY if you have been prescribed with drugs.

22. Name the drug prescribed for your child. _____

23. Do you agree with the treatment schedule provided by the doctor? Yes No

24. Did you ask the doctor to prescribe any drugs for your child? Yes No

25. Did you ask the doctor to prescribe any specific drug for your child? Yes No

26. Do you think doctors prescribe drugs to children too easily? Yes No

27. Did you discontinue the drug therapy before the standard length of therapy? Yes No (skip question 28)

28. If you have answered Yes to Question no. 27, why did you discontinue the drug? symptoms have disappeared drugs ran out side effects appeared child was unwilling to take the medication others

29. Has your child suffered from any side effects due to the use of medication (such as allergy/ diarrhea/ pain etc.)? Yes No (skip question 30)

30. If you have answered Yes to Question no. 29, what side effects did your child show? _____

Status of parental understanding of antibiotic use and resistance

	Statements	Agree	Disagree	Neither agree or disagree	Don't know
31.	Antibiotic resistance is promoted by using antibiotics when they are not needed				
32.	Antibiotic resistance is promoted by not completing the full course of antibiotics				
33.	Antibiotic resistance is promoted by self-medication of antibiotics				
34.	Antibiotic resistance is promoted by using antibiotics with other drugs				
35.	Viral infection with fever should be treated with antibiotics				
36.	Antibiotics will always be effective in the treatment of same infection in future				

4.1 Demographic information

Table 8: Distribution of the respondents by their gender

Gender	Amount	Percentage (%)
Male	104	81.25
Female	24	18.75

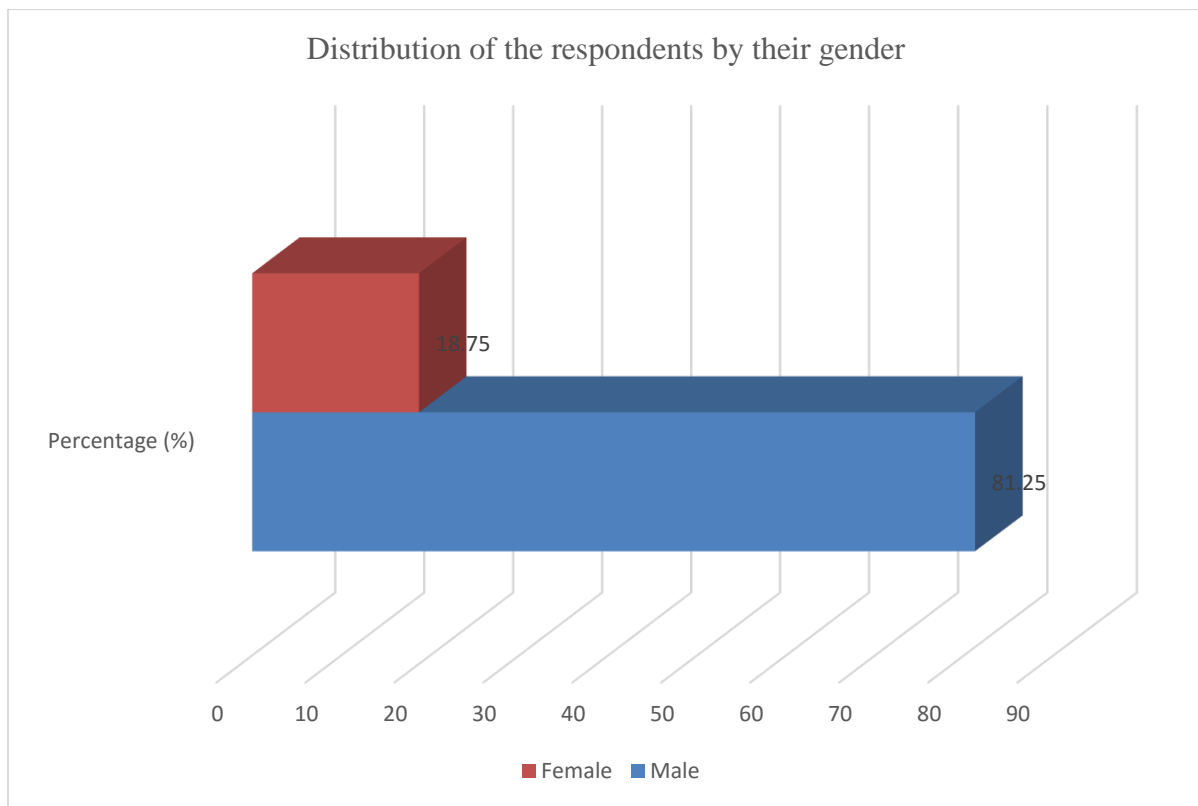


Figure 2: distribution of the respondents by their gender.

Table 9: Distribution of the respondents by their education level

Educational level	Amount	Percentage (%)
Primary school (class 5 eq.)	10	8
Secondary school (class 10 eq.)	33	26
Higher secondary school (class 12 eq.)	24	19
Non-university diploma	9	7
Bachelors (university)	35	27
Post-graduate (university)	17	13

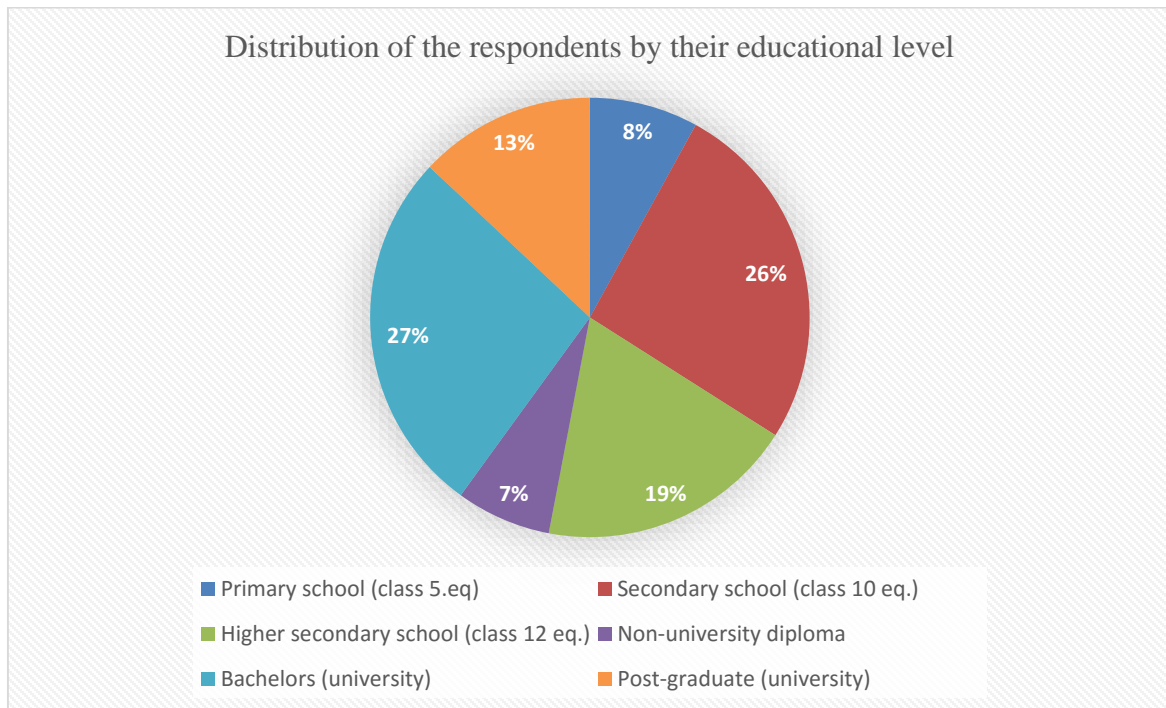


Figure 3: Distribution of the respondents by their education level

Table 10: Distribution of the respondents by their occupation

Occupation	Amount	Percentage (%)
Studying	7	7
Service Holders	67	52
Homemakers	19	15
Healthcare professionals	9	6
Unemployed	21	16
Others	5	4

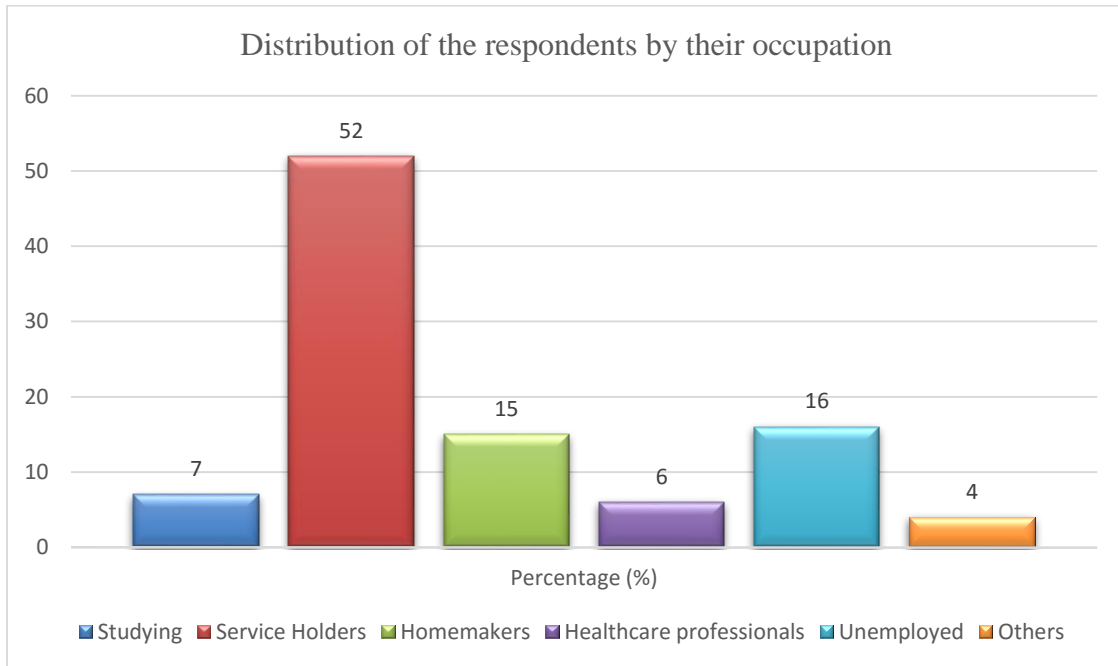


Figure 4: Distribution of the respondents by their occupation.

Table 11: Distribution of the respondents by their income

Income range (Tk.)	Amount	Percentage (%)
<5000	2	2
5000-10000	34	27
10000-30000	53	41
30000>	39	30

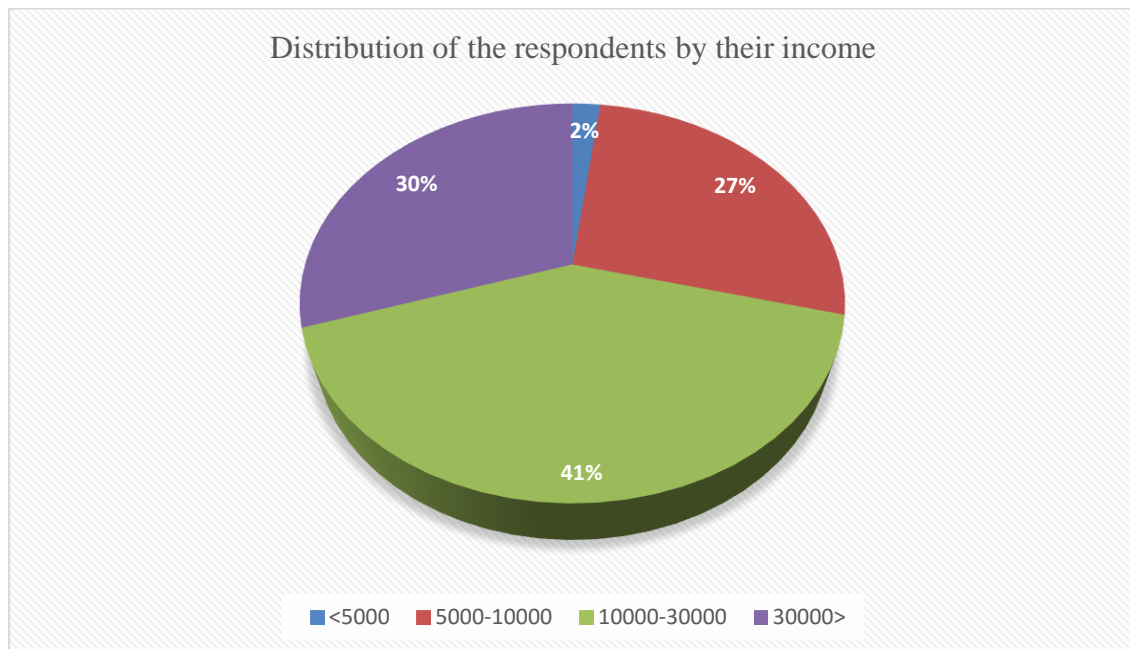


Figure 5: Distribution of the respondents by their income.

Table 12: Distribution of the respondents by the age of their children

Age range	Amount	Percentage (%)
<3 months	4	3
3 months- 1 yr.	11	9
1 yr.- 5 yrs.	21	16
5 yrs.- 12 yrs.	92	72

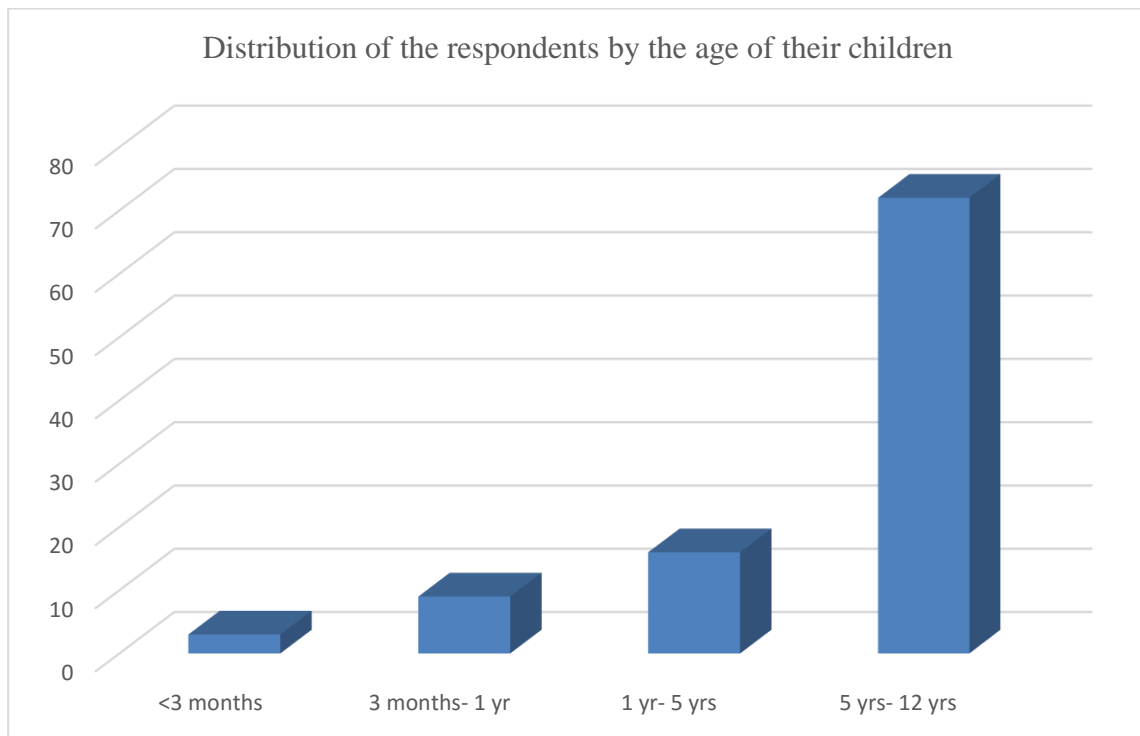


Figure 6: Distribution of the respondents by the age of their children.

Table 13: Distribution of the respondents by the gender of their children

Gender	Amount	Percentage (%)
Male	79	62
Female	49	38

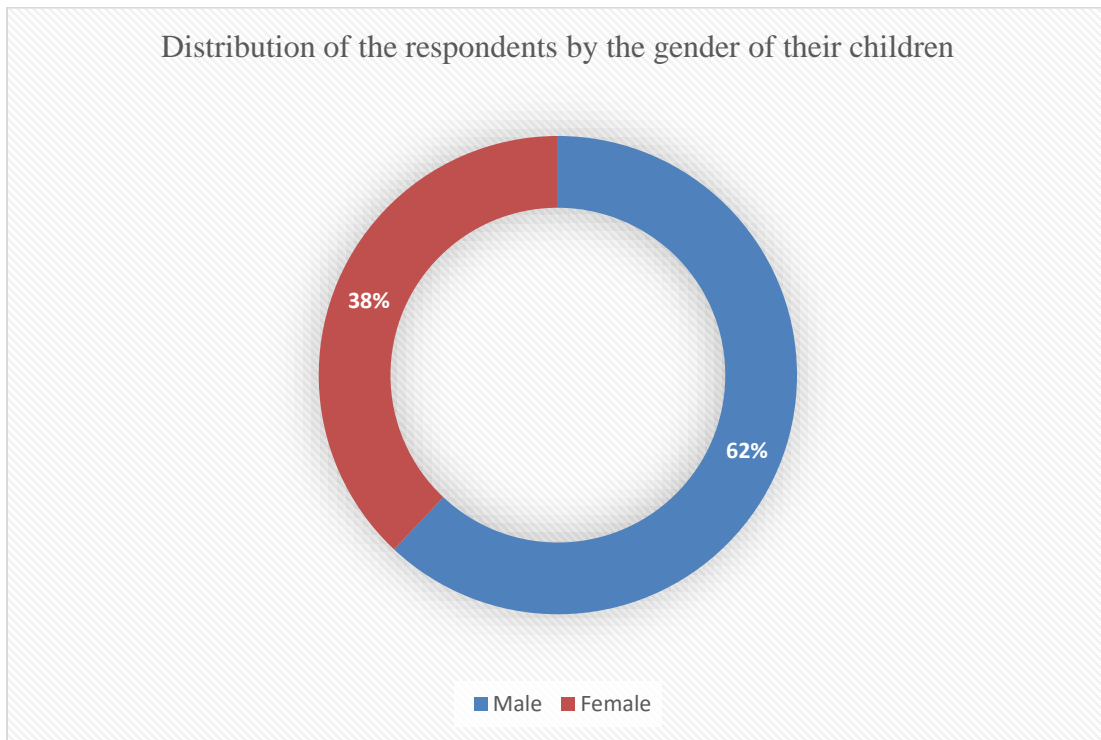


Figure 7: Distribution of the respondents by the gender of their children.

Table 14: Distribution of the respondents by the nature of their children's complications

Types of complications	Amount	Percentage (%)
Respiratory (asthma/ cough/ others)	5	4
Gastrointestinal (diarrhea/ constipation/ others)	29	23
Fever	12	9
Common cold	66	51
Dermatological (allergies/ others)	6	5
Others	10	8

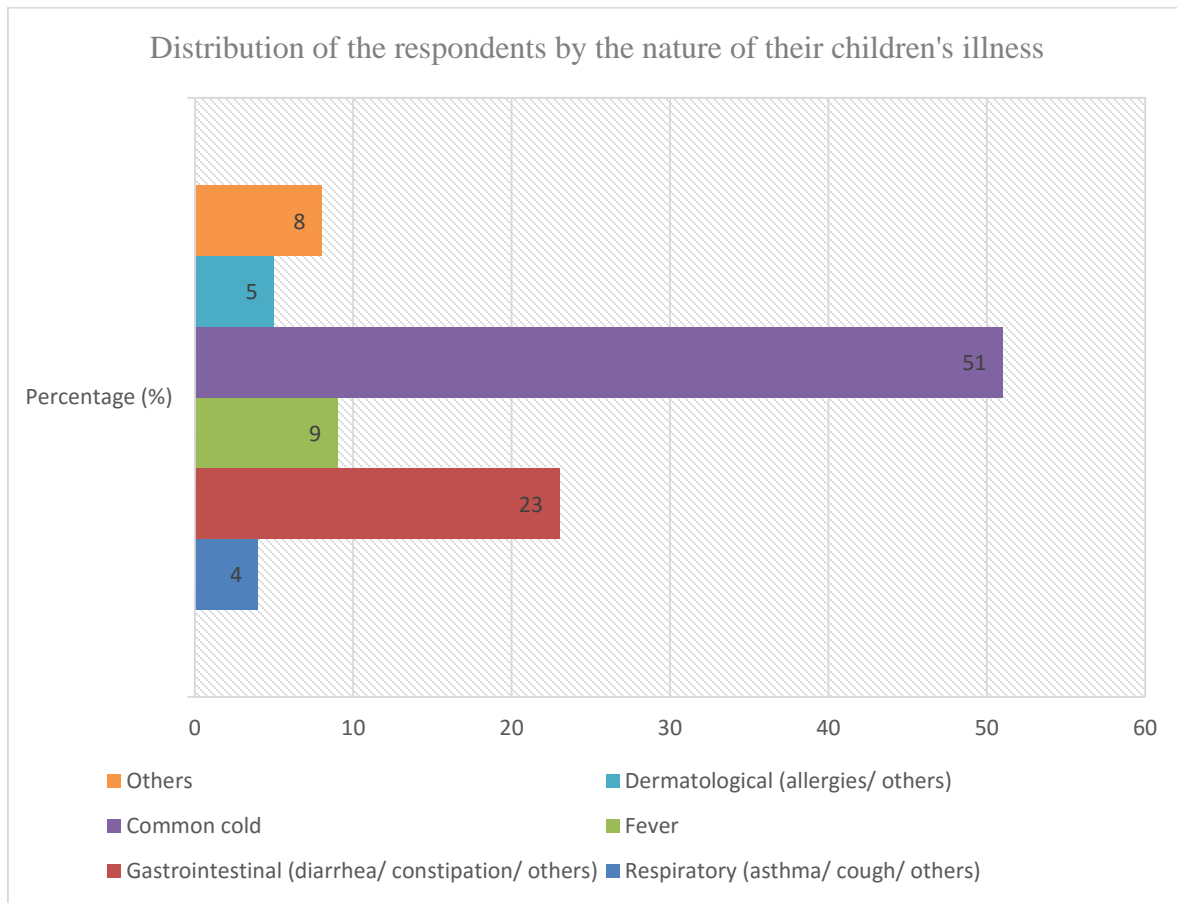


Figure 8: Distribution of the respondents by the nature of their children's complications.

Table 15: Distribution of the respondents by the health status of their children

Health status	Amount	Percentage (%)
Good	78	61
Fairly good	26	20
Moderate	13	10
Fairly poor	8	6
Poor	3	3

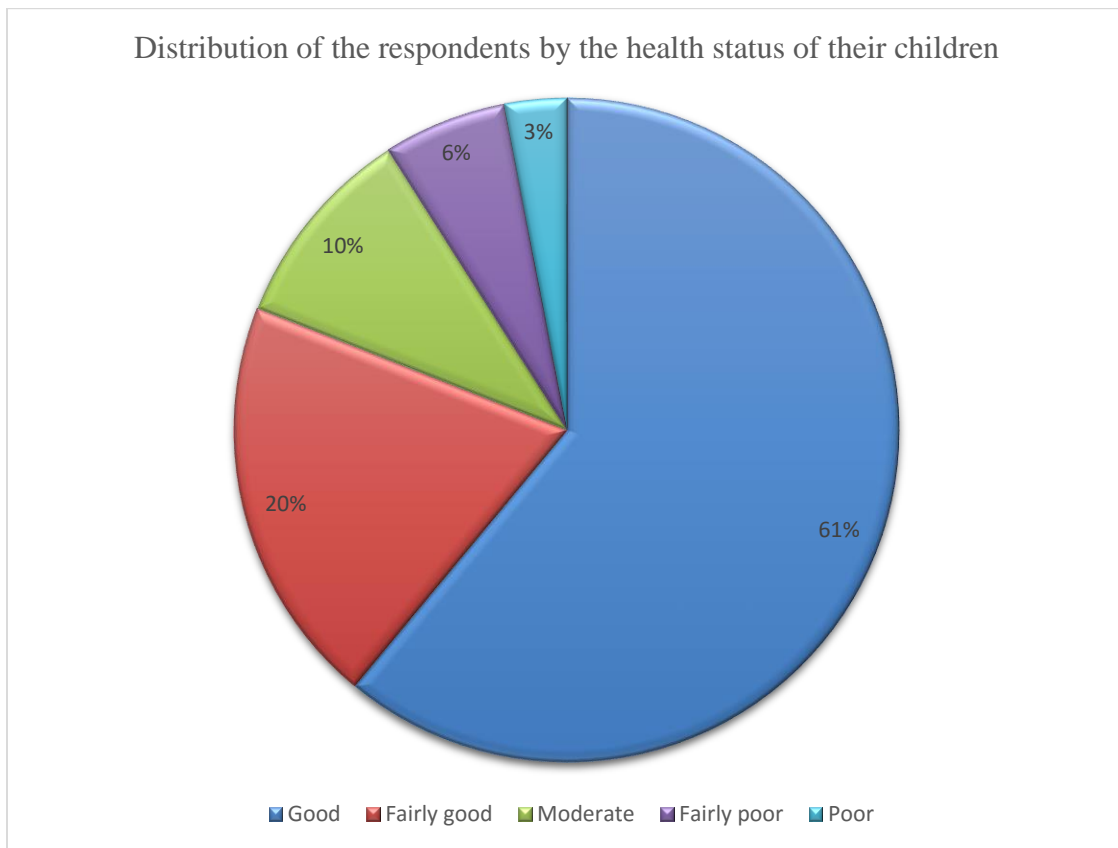


Figure 9: Distribution of the respondents by the health status of their children.

4.2 Parental perception and understanding of drug use

Table 16: Distribution of the respondents by their behavior upon children's illness

Statement	Amount	Percentage (%)
Consulted a doctor and medicated according to prescription	68	53
Consulted a non-prescribing healthcare professional	12	9
Waited until the disease, disorder or injury relieved itself	9	7
Self-medicated	39	31

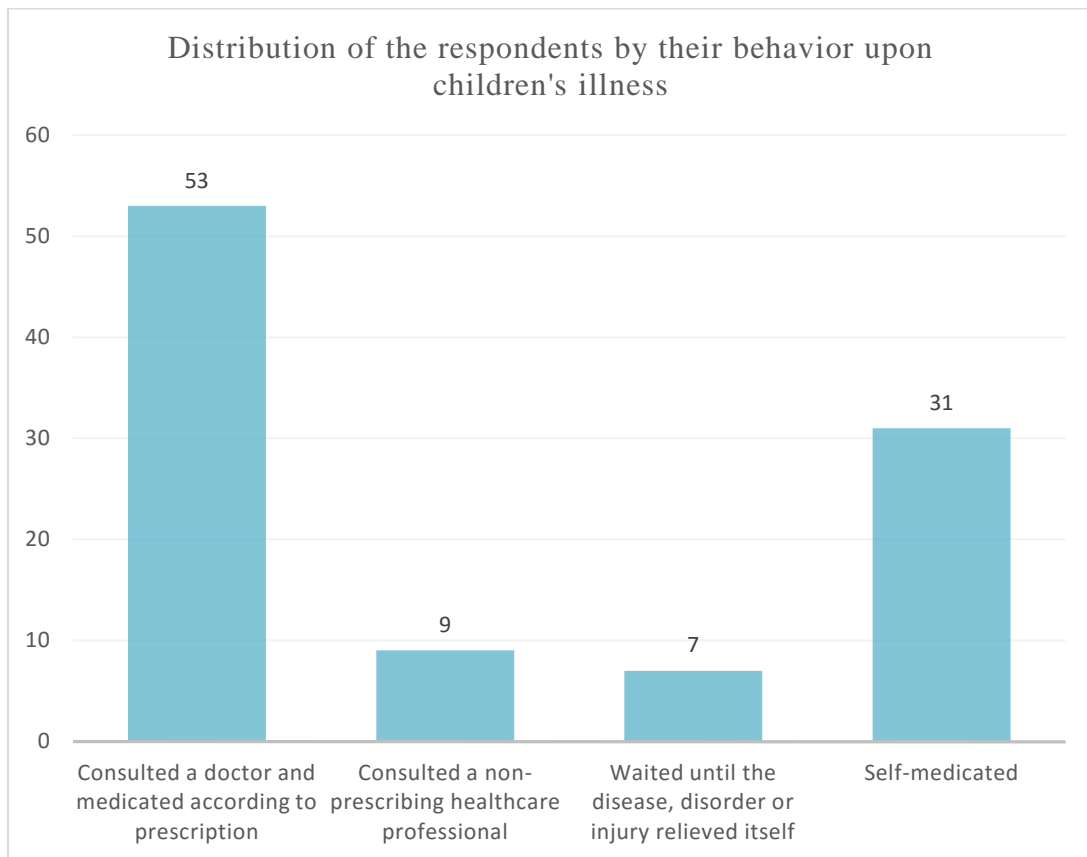


Figure 10: Distribution of the respondents by their behavior upon children's illness.

Table 17: Distribution of the respondents by their perceptions on safety of self-medication upon consult

Statements	Amount	Percentages (%)
Yes	7	18
No	32	82

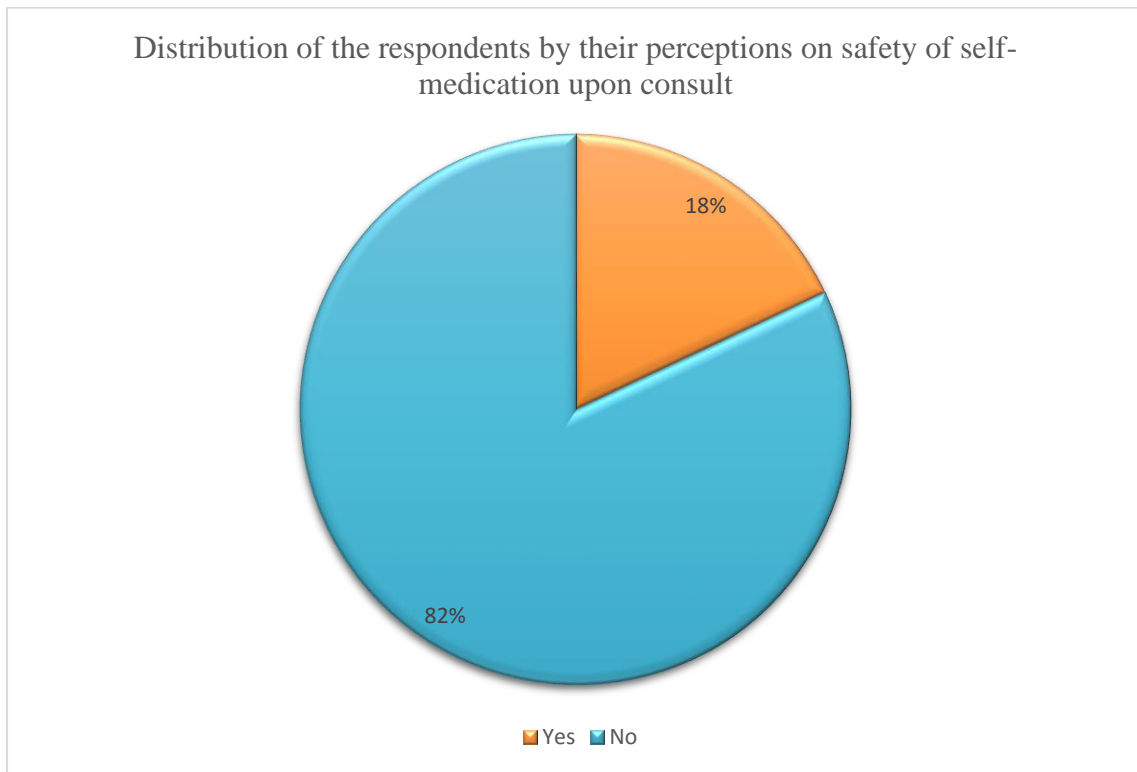


Figure 11: Distribution of the respondents by their perceptions on safety of self-medication upon consult.

Table 18: Distribution of the respondents by their reasons of self-medicating their child

Reasons	Amount	Percentage (%)
Considered ailment as minor, not requiring physician's consult	15	38
Self-decision by parents	8	20
Previous treatment by physicians was unsuccessful	5	13
Long waiting time to avail the doctor	1	3
Asked doctor for a medication, but he refused to prescribe	0	0
Shortage of drug supply in stores	1	3
Previous prescription as references for same illness	5	13
High cost of treatment in private clinics	1	20
Taking the child along is inconvenient	1	13
Lack of nearby health care provider	0	0
Problems with behavior/ attitude of medical staff	2	13

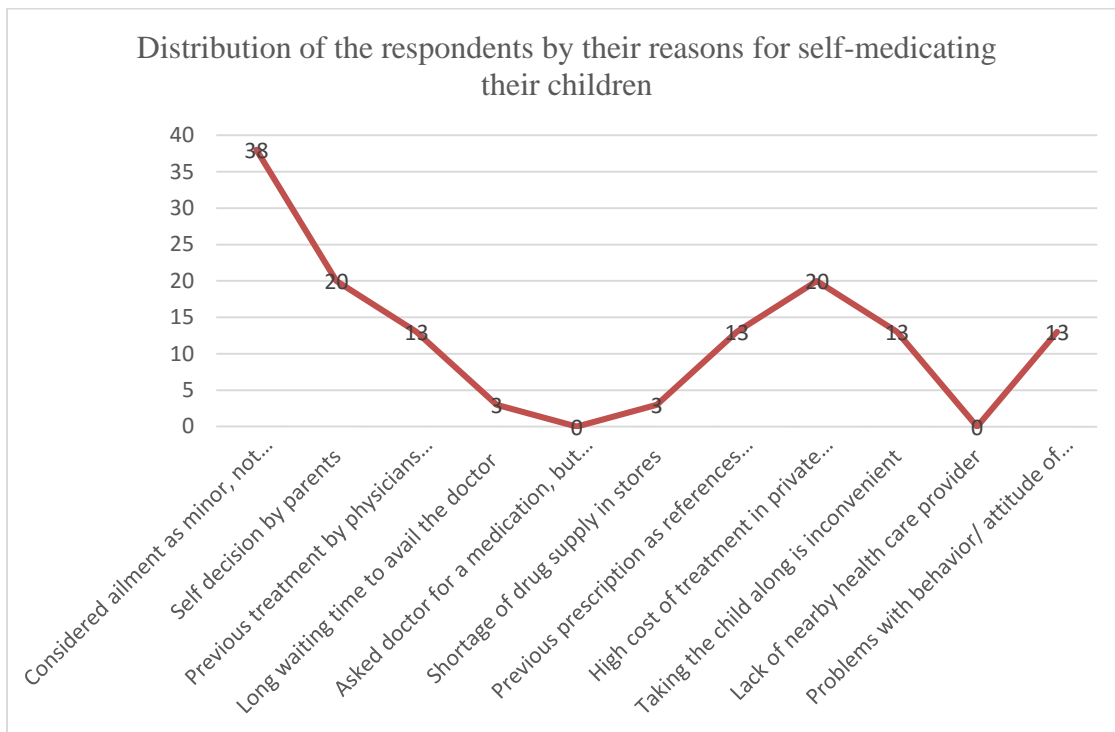


Figure 12: Distribution of the respondents by their reasons of self-medicating their child.

Table 19: Distribution of the respondents by the types of drugs they self-medicated to child

Types of drugs		Amount	Percentage (%)
Anti- bacterial	Amoxicillin	13	33
	Cotrimoxazole	2	5
Analgesic	Paracetamol	3	8
Anti- allergic	Chlorpheniramine	7	18
	Diphenhydramine	3	8
Respiratory	Ambroxol	3	8
	Salbutamol	1	2
	Budesonide	1	2
	Xylometazoline (nasal spray)	1	2
Gastrointestinal	Zinc sulphate	3	8
Dermatological	BenzyI benzoate	1	2
	Silver sulfadiazine (topical)	1	2

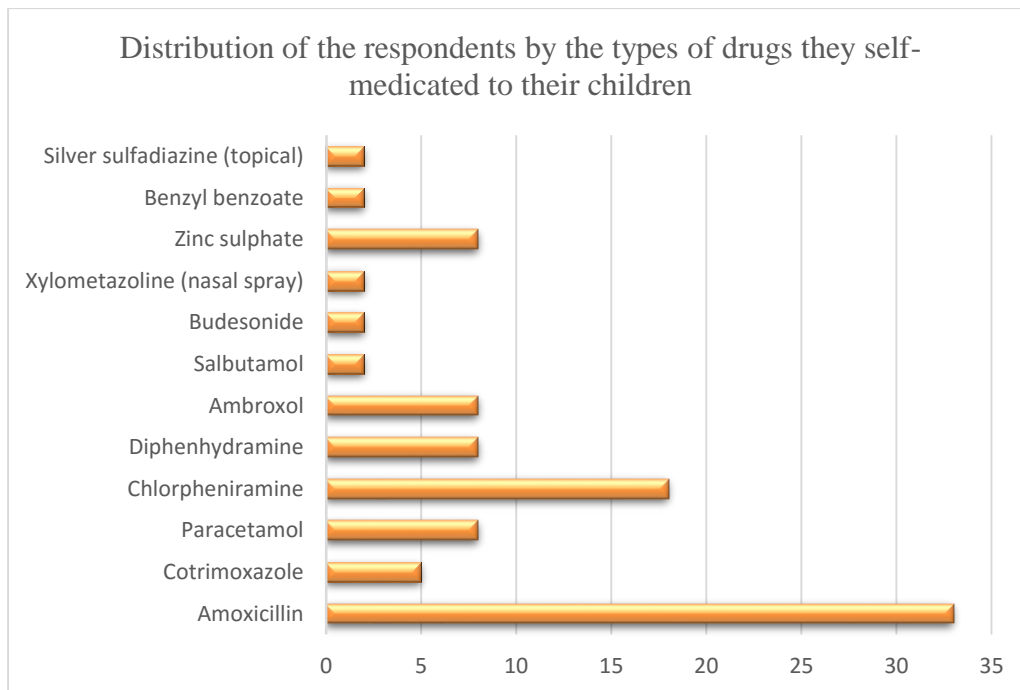


Figure 13: Distribution of the respondents by the types of drugs they self-medicated to child.

Table 20: Distribution of the respondents by the knowledge of the parents about the drugs self-medicated

Statement	Amount	Percentage (%)
Yes	12	31
No	27	69

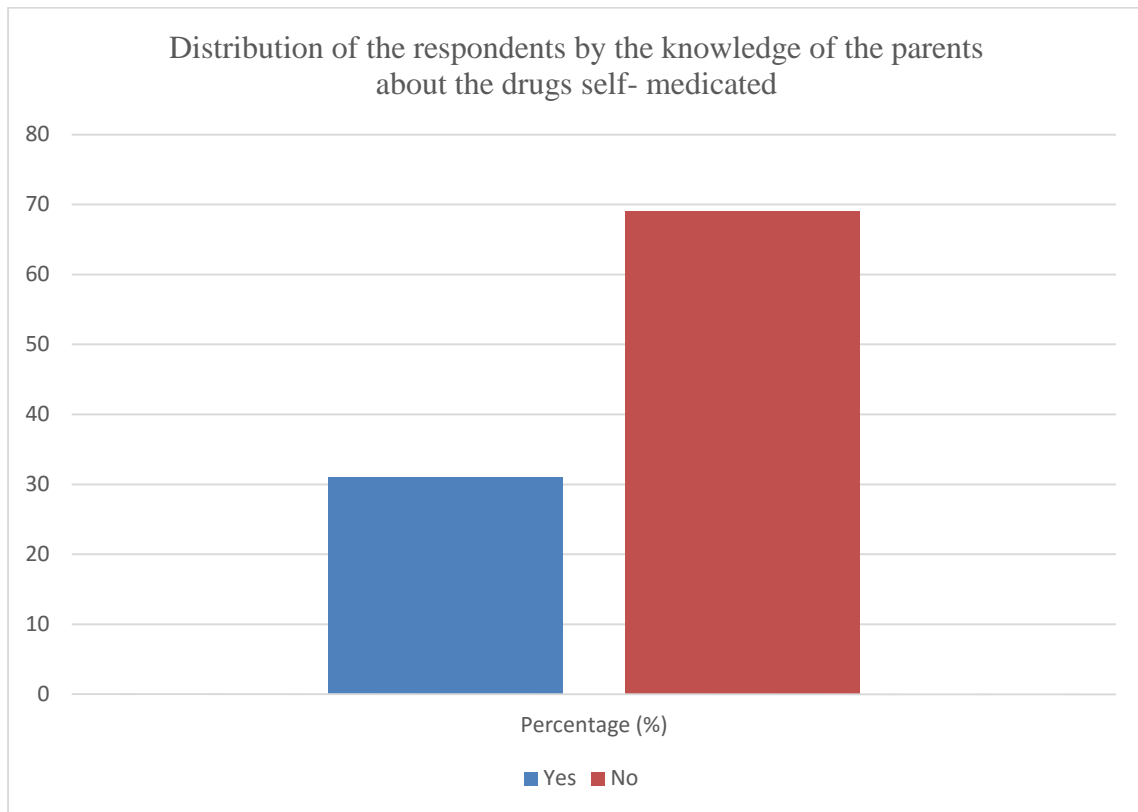


Figure 14: Distribution of the respondents by the knowledge of the parents about the drugs self-medicated.

Table 21: Distribution of the respondents by the sources from where they obtained drugs' information

Sources	Amount	Percentage (%)
Healthcare professionals	23	59
Drug sellers	7	18
Family and friends	5	13
Media (TV/ Radio/ Newspaper)	2	5
Patient information leaflet/package insert	2	5

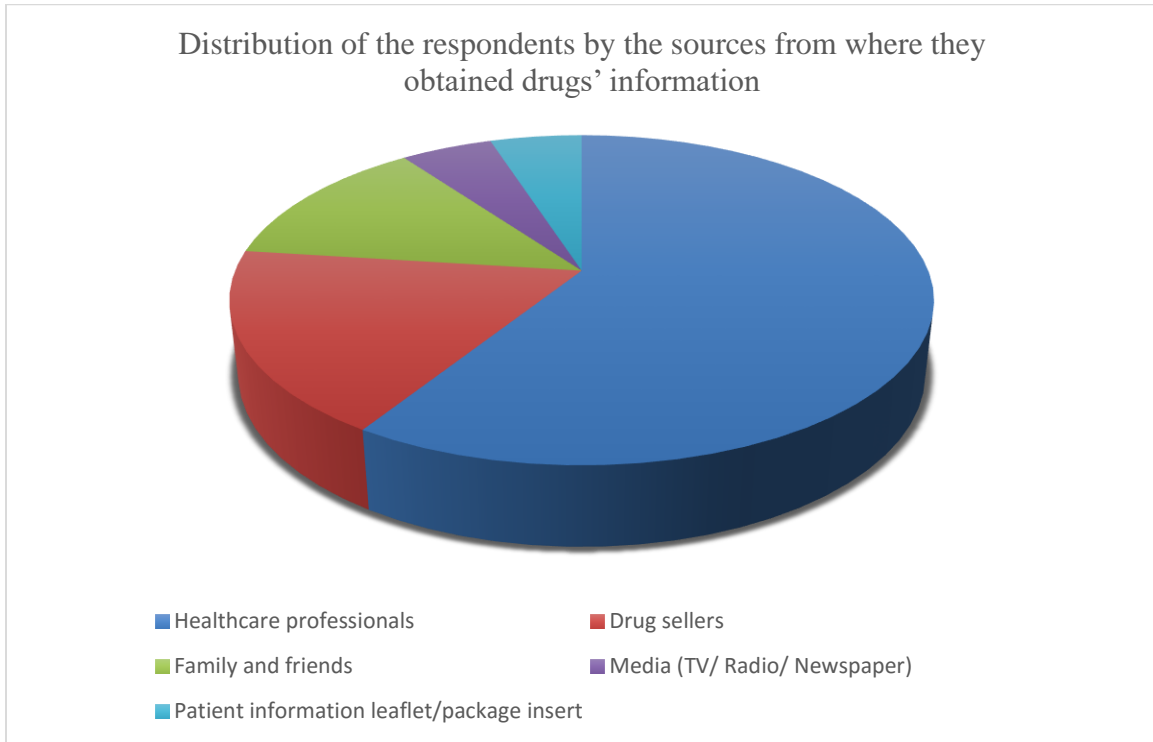


Figure 15: Distribution of the respondents by the sources from where they obtained drugs' information.

Table 22: Distribution of the respondents by the source of medications

Sources	Amount	Percentage (%)
OTC from dispensaries	13	33
Healthcare professionals other than relevant doctor	17	44
Friends and family	6	15
Family medicine cabinet	2	5
Others	1	3

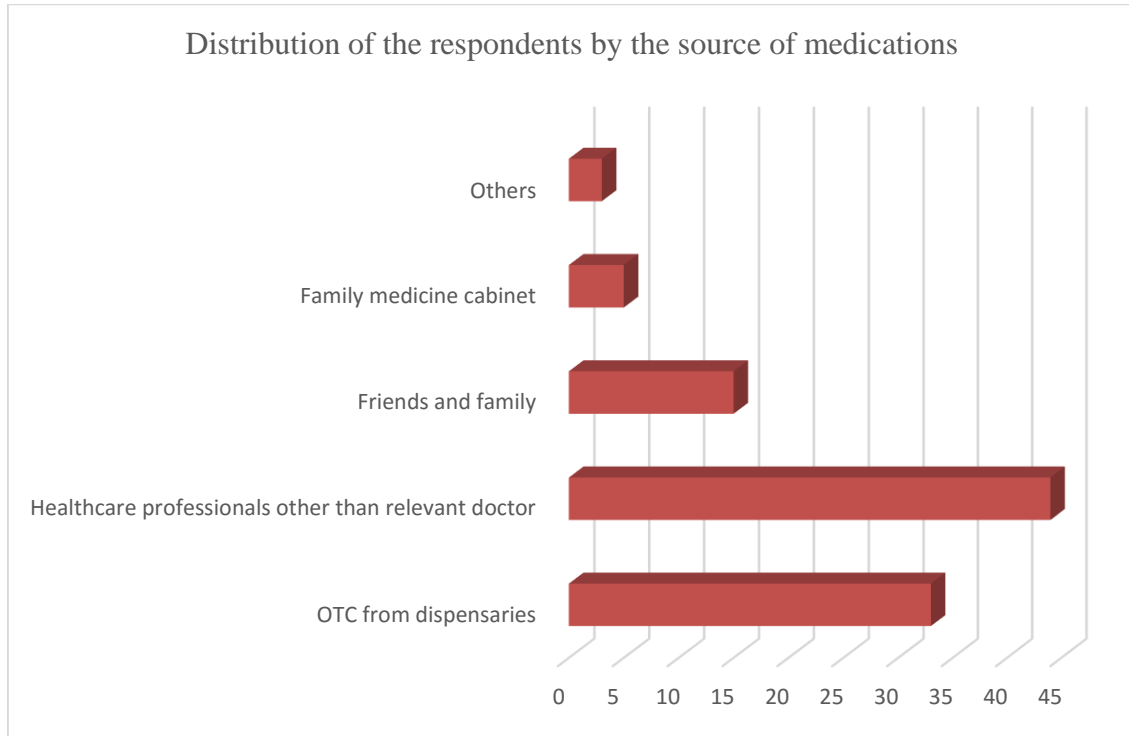


Figure 16: Distribution of the respondents by the source of medications.

Table 23: Distribution of the respondents by the types of drugs prescribed by consultants

Types of drugs		Amount	Percentage (%)
Anti- bacterial	Amoxicillin	27	39
	Cotrimoxazole	5	7
Analgesic	Paracetamol	4	6
Anti- allergic	Chlorpheniramine	16	23
	Diphenhydramine	2	3
Respiratory	Ambroxol	3	4
	Salbutamol	2	3
	Budesonide	1	2
	Xylometazoline (nasal spray)	1	2
Gastrointestinal	Zinc sulphate	5	7
Dermatological	BenzyI benzoate	2	3
	Silver sulfadiazine (topical)	1	1

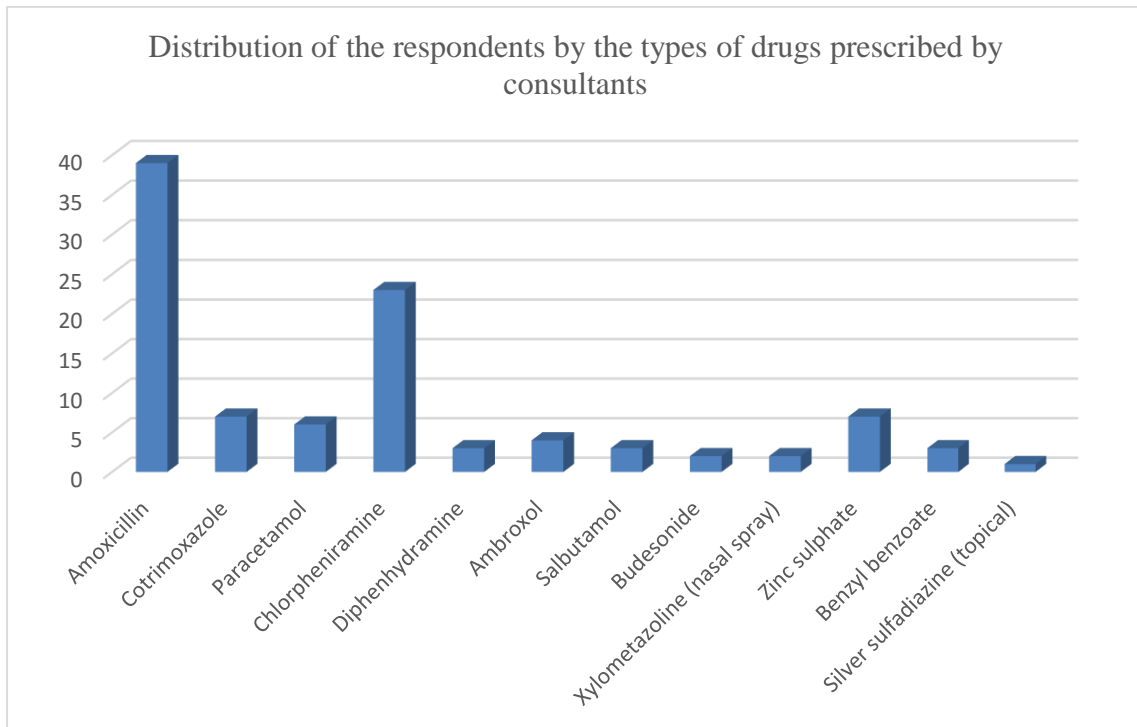


Figure 17: Distribution of the respondents by the types of drugs prescribed by consultants.

Table 24: Distribution of the respondents by the discontinuation of prescribed drug therapy by parents

Statement	Amount	Percentage (%)
Yes	26	38
No	43	62

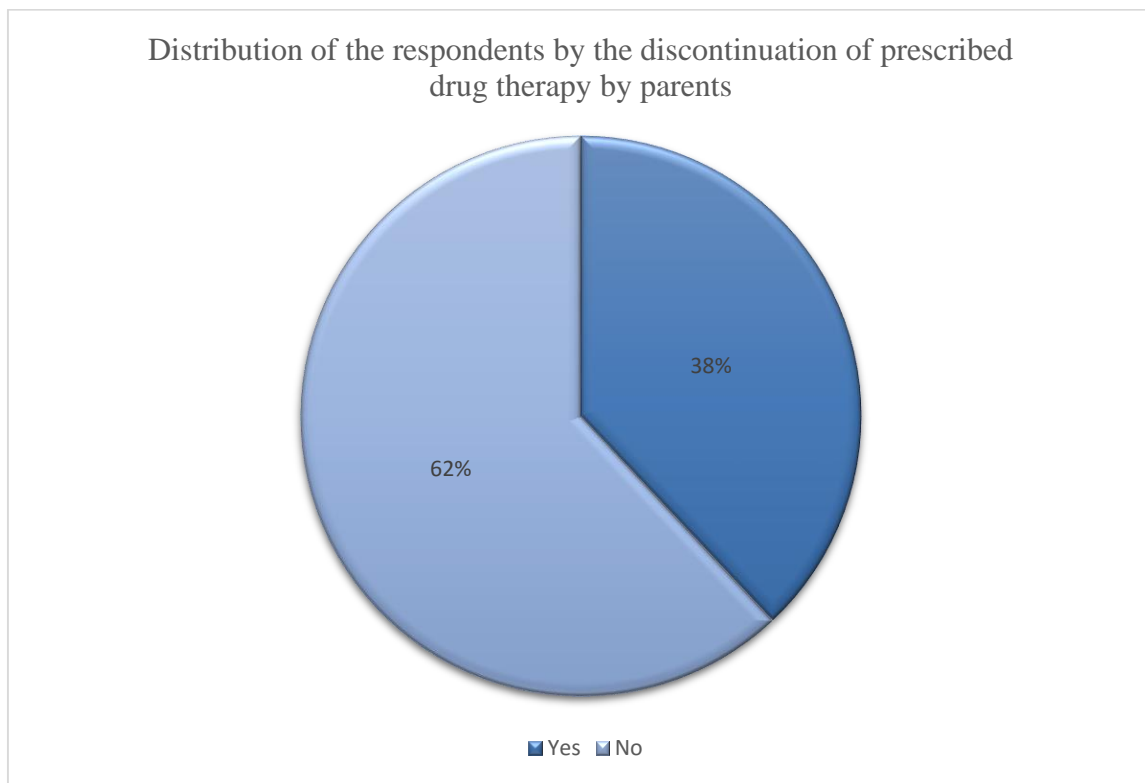


Figure 18: Distribution of the respondents by the discontinuation of prescribed drug therapy by parents.

Table 25: Distribution of the respondents by the reasons for discontinuation of prescribed drug therapy

Reasons	Amount	Percentage
Symptoms have disappeared	35	51
Drugs ran out	9	13
Side effects appeared	12	17
Child was unwilling to take the medications	7	10
Others	6	9

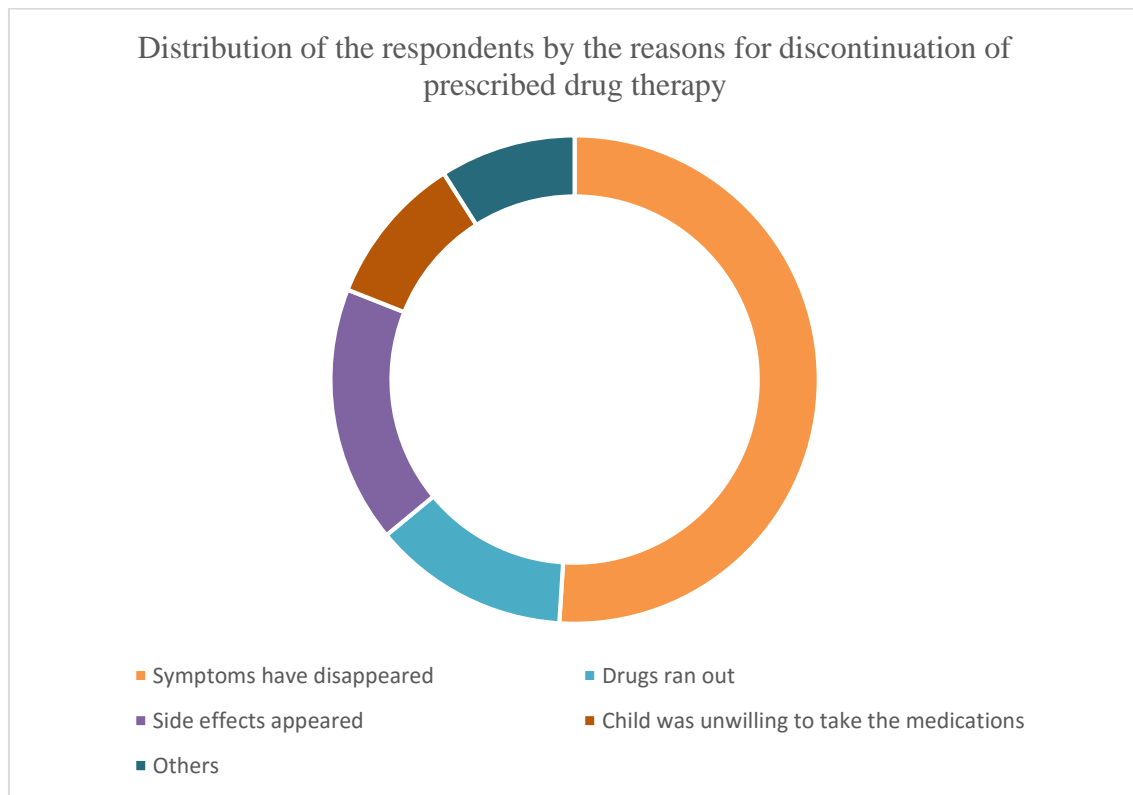


Figure 19: Distribution of the respondents by the reasons for discontinuation of prescribed drug therapy.

Table 26: Distribution of the respondents by the confirmation of side-effects due to use of medication

Statement	Amount	Percentage (%)
Yes	9	75
No	3	25

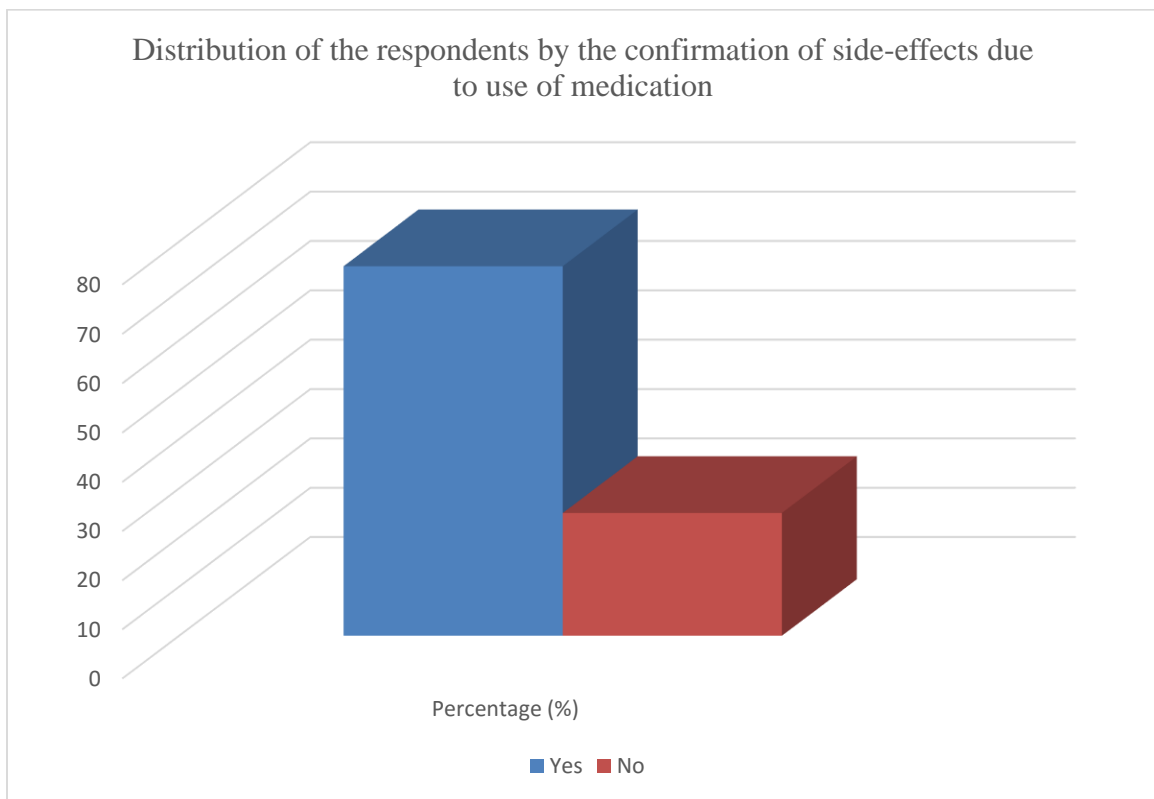


Figure 20: Distribution of the respondents by the confirmation of side-effects due to use of medication.

Table 27: Distribution of the respondents by the status of understanding of antibiotic use and resistance

Statements	Agree	Disagree	Neither agree or disagree	Don't know
Antibiotic resistance is promoted by using antibiotics when they are not needed	49	34	32	13
Antibiotic resistance is promoted by not completing the full course of antibiotics	62	28	23	15
Antibiotic resistance is promoted by self-medication of antibiotics	44	35	27	22
Antibiotic resistance is promoted by using antibiotics with other drugs	47	27	35	19
Viral infection with fever should be treated with antibiotics	52	17	25	34
Antibiotics will always be effective in the treatment of same infection in future	46	23	24	35

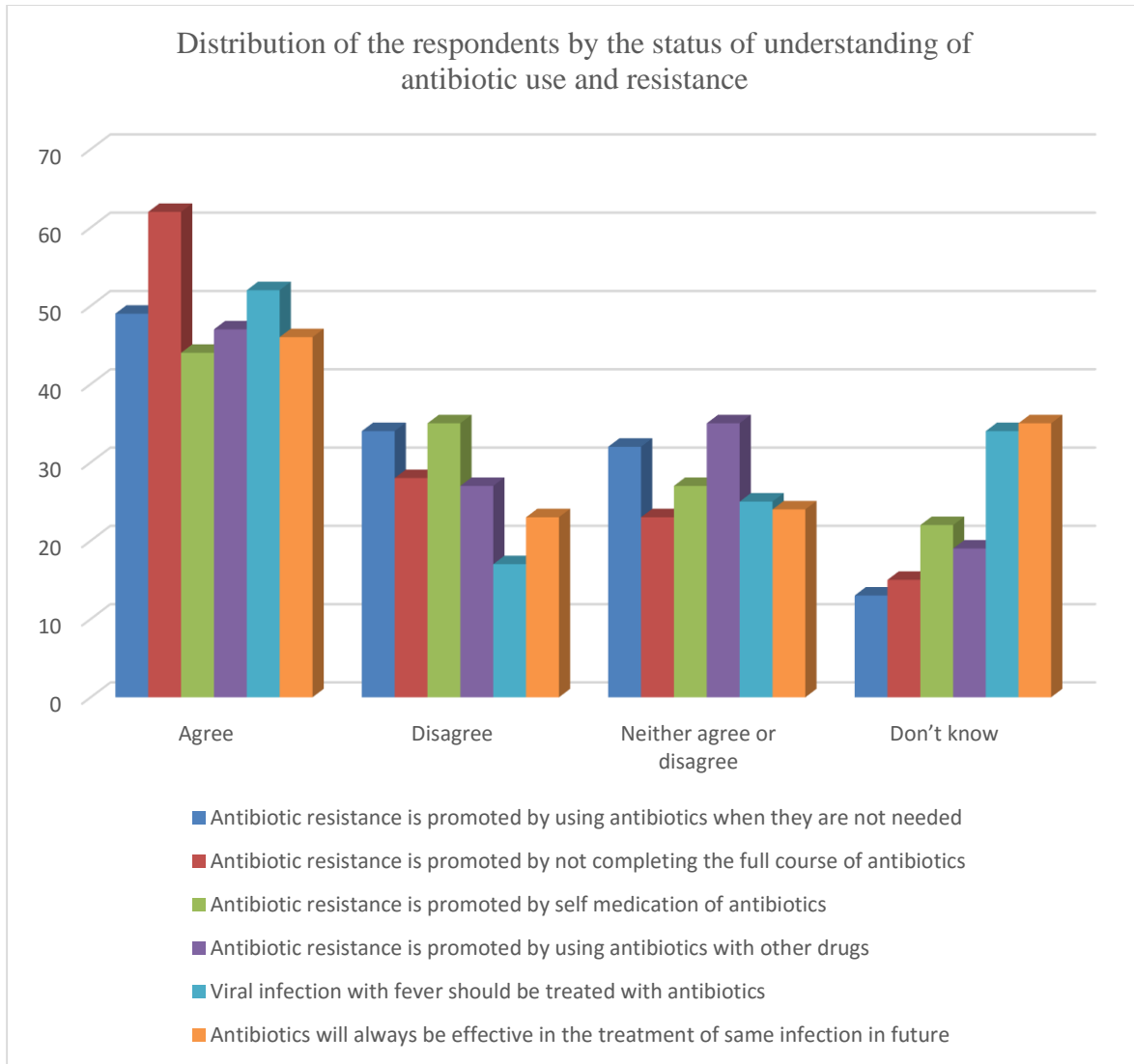


Figure 21: Distribution of the respondents by the status of understanding of antibiotic use and resistance.

Discussion

The study was conducted in Dhaka city only because it is the capital and largest city in Bangladesh regarding the number of population and also due to financial and time factors. This study found that male respondent i.e. fathers were involved in administrating self-medicated antibiotics relatively more than mothers; the possible explanation of this slight difference is that some women considered that the father is more appropriate for this mission or they could not leave their homes without companionship of a male relative from the first degree.

Our study found that SM practice in the group of 5-12 years was higher than that for children aged below one year or those between 1-5 years possibly because the children of 5-12 years are neglected to bacterial infections as the parents consider that older children have good immune and body defense which make them less worried about conditions of the children, along with the high expense of antibiotic medications.

The reason of practicing SM for 46 of the respondents was their perception that the child was exposed previously to the same current ailment, therefore they considered that the prescription will be the same if they visited the healthcare professionals and also considered that they had good experience and became familiar with the appropriate antibiotics for managing this current condition.

This study revealed that the most frequent conditions which motivated the parents to practice SM for their children were Upper Respiratory Tract conditions (cough, sore throat and flu or common cold respectively). The probable explanation for this finding is that the study was conducted in winter and spring which may increase the incidence of these conditions and because many individuals in the community, including the parents, believe that antibiotics can reliably treat and eradicate any microorganism causing upper respiratory tract infections whether its type and also because they believe that these conditions are self-limited and could be treated safely by self-medicated antibiotics without the need to see the healthcare professionals.

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