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**SOCIO-CULTURAL FACTORS INFLUENCING THE UTILIZATION OF FIRST-LINE
ANTIBIOTICS IN MANYATTA 'A' SUB-LOCATION, KISUMU CITY, KENYA**

BY

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ABSTRACT

The prevalence of self-medication with antibiotics in Kenya in 2009 was 58.2%, in Nyanza 68.5% and Kisumu 64.8%. Although antibiotics resistance is primarily a medical problem, factors influencing its spread are sociocultural, ecological and epidemiological. In Manyatta 'A' sub-location, Kisumu County, little is known about the socio-cultural factors in the utilization of first-line antibiotics, especially from the perspective of consumers. This study specifically explored knowledge about use of first-line antibiotics among pharmacy clients; analyzed beliefs, perceptions and behavior on antibiotics use and; appraised the methods preferred by pharmacy clients for learning about first-line antibiotics use. The study was guided by Kleinman's (1980) explanatory model of health and illness. Study design was descriptive. The study population comprised 28 pharmacies, pharmacy clients, chief pharmacists and pharmacy clerks. Sample size for pharmacies was 8 drawn through Prakash's (1994) 30% threshold. The 8 pharmacies were selected through simple random sampling. Sample size for pharmacy clients was 102 determined through a modified theoretical sampling strategy and justified according to Kathuri and Pals (1993) that a sample of at least 100 is sufficient for a survey. The 102 pharmacy clients, chief pharmacists and pharmacy clerks from the 8 pharmacies were purposively selected. Sample size for household follow-up interview was 31 informants determined according to Prakash 30% rule. The 31 informants were selected through systematic sampling. Quantitative and qualitative data were collected through 102 semi-structured questionnaires. More qualitative anthropological data were collected using 31 unstructured questionnaires, 8 key informant interviews and 3 focus group discussions. Quantitative data were analyzed using descriptive statistics through Excel and results presented in frequency tables. Qualitative data were analyzed thematically and presented through verbatim quotes. Results showed that amoxil and septrin were mostly used to treat coughs, diarrhea, and *yamo*. *Yamo* is an indigenous disease category referring to a constellation of perceived ailments including boils, rashes, coughs, measles, diarrhea, fever and flu associated with self-medication with antibiotics. Perceived knowledge on indication of the antibiotics was based on socialization and history of previous experience with the drug. Inaccessibility of health services and perceptions of severity or non-severity of illnesses influenced decisions to acquire antibiotics without prescription. The antibiotics regimen was stopped when symptoms disappeared. Preferred methods of learning about antibiotics use are door-to-door campaign and *barazas*. The study recommends the need to define more clearly measures of patients' knowledge, evaluation of consumers' perceptions about dosage form preferences, self-medication and non-compliance. Health planners, policy makers and program managers should develop effective interventions on appropriate use of antibiotics that takes into account health beliefs and perceptions of local population.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Pharmaceutical anthropology views medicines as objects of study. It is based on the premise that the lack of reliable information on local pharmaceutical knowledge in the public debate should prompt anthropologists to focus their attention on pharmaceuticals in their social and cultural contexts (Van der geest, 2006). Indeed, drug use is influenced by cultural preferences and beliefs (Vander Geest, 1987). People draw these objects into their own world by clothing them with explanations and meanings from their own cultures and antibiotics do not escape this reality (Radyowijati & Haak, 2003).

Antibiotics are chemical compounds used to treat bacterial ailments (Nordqvist, 2009). For practical purposes, they may be divided into two main categories. These include the first-line category that are mainly in general use and whose therapeutic values are well established. This category comprises amoxicillin (amoxil), co-trimoxazole (septrin), tetracycline, flagyl, metronidazole, erythromycin, ampiclox, ciprofloxacin, ampicillin and chloramphenicol. The second-line consists of those antibiotics in restricted use either because the indications for them are more limited or because they are deliberately kept in reserve. There are special circumstances in which antibiotics in the second category are required. Either because of resistance of the bacteria to first-line antibiotics or hypersensitivity of the patient (Davidson & Macleod, 1971). The British Government (2014) report on antimicrobial resistance has projected a surge in deaths caused by antibiotics resistance and warned that 10 million people could die every year by 2050 from diseases caused by antibiotic resistant germs. Of the 10 million, nearly 4.1 million will be in Africa.

Medication adherence or compliance describes the degree to which a patient correctly follows instructions about medicine use. Globally, 50 percent of patients fail to take their medicines correctly even when drugs are made available (World Health Organization, 2002). World wide, data indicate that antibiotics such as amoxicillin, cotrimoxazole, erythromycin, ampicillin/cloxacillin, metronidazole, neomycin, tetracycline and cephalexin are frequently used indiscriminately and often misused (Marliere, Ferraz, & dos Santos, 2000; Calva & Bojalil, 1996; Orero, Ripoll, & Gonzalez, 1998; Van Dong, Binns, & Van, 1997). Statistics have shown that antibiotics have been

used in excess for decades in the world such that only 25 percent of patients with respiratory illnesses had any bacterial etiology (Gonzales, Maselli, & Sande, 2001; Gonzales, Malone, Masell, & Sande, 2001). In the United States for instance, studies have shown that treatment indication, choice or duration of antibiotic therapy was incorrect in 30% to 50% of cases (CDC, 2013; Luyt, Brechot, Trouillet, & Chastre, 2014).

Indeed, knowledge alone does not ensure appropriate use of drugs, but knowledge and understanding of treatment are certainly important factors in whether drugs are used well (World Health Organization & Drug Action Program, 1998). Consequently, a European Commission (2013) survey showed that most Europeans (84%) were aware that unnecessary use of antibiotics makes them become ineffective. Two thirds (66%) knew that frequent use of antibiotics could lead to side-effects and 41.3% believed that antibiotics kill viruses as well as bacteria. This finding is consistent with survey data in the United States which showed that 45% of adults who used an antibiotic believed that antibiotics could effectively treat viruses (Boyd, Edgar, & Foster, 2008). Patients in a study conducted in the United Kingdom, France, Belgium, Italy, Spain, Turkey, Thailand, Morocco and Colombia believed that most respiratory infections except the common cold require antibiotic therapy. As such, 11 percent had to exaggerate their symptoms to get an antibiotic prescription from their physician (Pechere, 2001).

Key issues addressed in the studies by Boyd et al. (2008), WHO and DAP (1998), and Pechere (2001) associated to the present study include attempt to address patients' perceived knowledge on the indication for the antibiotics. However, there is a discrepancy in as far as the consumers knowledge on specific effects of unnecessary use of the antibiotics is concerned. Furthermore, the studies were mainly conducted in Western countries even though dynamics of drug use in developed countries cannot be said to be similar with those in developing countries. Nonetheless, the studies are important because they describe behaviours and perceptions relating to antibiotics use elsewhere.

Socioeconomic and behavioral factors associated with antibiotic resistance in developing countries include misuse of antibiotics by health professionals, unskilled practitioners and laypersons. Antibiotics misuse by patients results in increased prevalence of communicable diseases and drug resistance leading to wasting of resources and increased morbidity and mortality (Okeke, Laxminarayan, Bhutta, Duse, Jenkins, & O'Brien, 2005).

In the Philippines, India, Mexico and Brazil, drug store customers based their decisions to buy antibiotics on advice that was given by friends or relatives (Calva, 1996; Dua, Kunin, & White, 1994; Lansang, Lucas-Aquino, Tupasi, Mina, Salazar, & Joban, 1990; Schorling, de Souza, & Guerrant, 1991). Despite the role of reference groups in antibiotics seeking behaviour being given prominence, drug store customers' purpose of purchasing antibiotics and their knowledge on the indication of the purchased antibiotics has not been elaborated (Calva, 1996).

Public knowledge and attitudes towards antibiotic usage was examined in a cross-sectional study among the general public in the state of Peng in Malaysia. According to the results of the study, nearly 55% of the respondents had a moderate level of knowledge. Three quarters of the respondents (76.7%) could correctly identify that antibiotics are indicated for the treatment of bacterial infections. However, 67.2% incorrectly thought that antibiotics were also used to treat viral infections. About 59.1% of the respondents were aware of antibiotic resistance phenomena in relation to overuse of antibiotics. With regard to attitudes, 38% believed that taking antibiotics when having a cold symptom could help them recover faster (Oh, Hassah, Al-Haddad, Sulaiman, Shafie, & Awaisu, 2011). These results are important in bringing out lay knowledge on antibiotics use such as the perceived knowledge on treatment indication of the antibiotics and knowledge on effects of overuse of antibiotics. A limitation of the study was its inability to show who provided the respondents with advice on which antibiotics to acquire for the treatment of the illnesses.

This perceived knowledge on which illnesses are treated with antibiotics echoes other studies in Philippines and Mexico. The findings showed that antibiotics were used to prevent diarrhea after eating suspected contaminated foods or by sex workers to prevent sexually transmitted diseases (Lansang *et al.*, 1990; Abellanos, 1996). Knowledge is reflected in the prophylactic use of antibiotics to prevent diarrhea and sexually transmitted diseases. However, source of advice for acquisition of the antibiotics was overlooked.

Over 80% of all drugs in developing countries are purchased by people for themselves or a family member without a prescription (Homedes & Vgailde, 2001). Apparently, self-medication and the reasons for the practice were explored in a study among

consumers in India. Results of the study showed that 73% (n=200) of patients bought medicines directly from chemist without visiting a doctor because of being aware of doctors previous prescriptions (93%) and chemists' advice (Kamath, & Lakhangaonkar, 2015). What remained to be explored was the beliefs and perceptions that influenced the behavior of non-adherence to the antibiotics. The study also generalized to other types of drugs and not only antibiotics.

Additionally, a finding of a study in Palestine showed that self-medication with antibiotics was most common among women, older people and people of higher socioeconomic classes (Sweileh, 2004). The role of consumer behavior in the acquisition of antibiotics has not been adequately addressed. This lacuna extends to the beliefs and perceptions on dosage forms of the antibiotics, the types of requests for acquisition of antibiotics and methods of educating consumers on rational antibiotics use.

Efforts have been undertaken to improve drug use in developing countries. In india for instance, studies have documented intervention methods to address antibiotics use. These include face-to-face education (Santoso, Suryawati, & Prawitasari, 1996) and seminar or workshop (Podhipak, Varavithya, Punyaratabandhu, Vathanophas, & Sanchai, 1993). Podhipak *et al.* (1993) study was however limited to interventions on treatment practices of diarrheal diseases among pharmacists and drug sellers. Furthermore, it was not focused on the methods preferred by consumers for educating them about proper use of antibiotics.

Studies in sub-Saharan Africa have demonstrated widespread problems in knowledge, attitudes, beliefs, and behaviors among consumers, which influence their antibiotic usage practices (Emslie & Bond, 2003; Hawkings, Butler, & Wood, 2008; McNulty, Boyle, Nichols, Clappison, & Davey, 2007; Vanden Eng, Marcus, Hadler, Imhoff, Vugia, Cieslak, & Besser, 2003). Despite the fact that self-medication was documented in Osemene and Lamikanra (2012) study among university students in southeastern Nigeria, it was limited to the prevalence of self-medication practices with antimalarials and antibiotics. It did not extend to the perceptions that influence self-medication with first-line antibiotics and non-compliance to the antibiotic dosage.

Moreover, Omolase, Adeleke, Afolabi and Afolabi (2007) study amongst general outpatients in a Nigerian community hospital was designed to determine the proportion of general out patients who practiced self-medication. Also included were the drugs employed and the reasons for resorting to self-medication. The study recommended that health care providers should educate patients on the dangers of self-medication and that such messages should be extended periodically to the community by government health ministries. Moreover, in Cameroon, visual aids (instructional devices such as a chart, map, or model that appeals chiefly to vision) were found to cause considerable improvement in patient compliance to antibiotic treatment (Ngoh & Shephard, 1994). These studies were conducted mainly in health facilities and patients views concerning proper use of antibiotics were not elicited. They highlight methods of antibiotics use education but not from the perspective of patients.

In Tadege's (2002) study in Addis Ababa, respondents were asked to provide reasons for acquisition of antibiotics without prescription. The respondents believed that the disease was not serious (36.6%) and 19.8% of them believed that it was not an emergency care. Lower income and higher level of education was found to be significantly associated with the increased risk of self medication with antibiotics among community members in Khartoum State, Sudan (Awad, Eltayeb, Matowe, & Thalib, 2005). Nonetheless, an examination of aspects of consumers' knowledge and perceptions that influence the selection, acquisition and use of the antibiotics has not been adequately exposed by Tadege (2002) and Awad et al. (2005). These include consumers' source of advice, knowledge of the indication of the antibiotics, dosage form preferences and types of requests for the antibiotics.

The role of social networks in the process of medical care, specifically antibiotics use was brought out in a study of two student groups at Makerere University in Uganda. When asked the course of action if they felt the antibiotic being used was not helpful, 35.1% in group A and 50.6% in group B said they would go back to the same health care worker for advice (Nambatya, Nyairo, Bironse, Kachwiya, Musigunzi, & Kamulegeya, 2011). These statistics point to the confidence the students had on the healthcare provider to prescribe antibiotics. However, there is a dearth of information on whether the students knew the health effects associated with inappropriate use of antibiotics.

In western Uganda, resistance to Ampicillin, Amoxicillin and Chloramphenicol has been documented (Anguzu & Olila, 2007). Resistance in surgical in-patients is significantly higher than outpatients (Joloba, Bajaksouzian, Palavecino, Whalen, & Jacobs, 2001). Data on the impact of antibiotics use in Uganda revealed that 90% (45,591) of patients did not have a clinical indication for antibiotic treatment, with 42% within this group inappropriately prescribed antibiotics to (Means, Weaver, Burnett, Mbonye, & Scott, 2014). While Means *et al.* (2014) brings out the impact of antibiotics misuse, it does not specify factors which constitute patients' knowledge such as source of advice for acquisition of the antibiotics, perceptions on dosage forms, types of requests and non-adherence. Additionally, there was no examination of the methods that would be used to educate patients about proper use of antibiotics.

Studies show that methods to address inappropriate antibiotic use in Uganda include standard treatment guidelines (Nabiswa, Makokha, & Godfrey, 1993) and public health education through posters. However, the impact of public health education on appropriate use of antibiotics through posters was not successful as the messages were not correctly understood. These intervention studies did not elicit patients' proposals towards proper use of first-line antibiotics (Adome, Ortenblad, Azati, Nsabagasani, Turinde, & Owor, 1996).

In Kenya, first-line antibiotics used to treat diseases are no longer as effective while second-line antibiotics are too expensive and not nearly as accessible (Mumo, 2010). Kenya bureau of statistics (2009) report indicated that self-medication in Kenya was at 58.2%. Statistics also showed that 45 percent of pharmacy clients in Kenya arrived without prescriptions and requested specific antibiotics (Kwena, Sharma, Wamae, Muga, & Bukusi, 2008). In drug stores in Kibera, 94 percent of customers or patients requested smaller doses of antibiotics for the management of sexually transmitted infections (Thoithi & Okalebo 2009). These statistics suggest an urgent need to strengthen intervention strategies to mitigate the misuse of antibiotics by consumers. However, the studies (Kwena *et al.*, 2008; Thoithi & Okalebo, 2009) have not shown why the clients arrived without prescriptions and how they requested for the specific antibiotics.

Kenya bureau of statistics (2009) stated that the prevalence of self medication in Nyanza was 68.5% and in Kisumu 64.8%. Owuor, Alwar and Oyugi (2015) found out that in

Nyalenda B, Kisumu County, the proportion of households self medicating with antibiotics and/or antimalarials was 76.9% (n=350). One of the perceived factors that influenced self medication with antibiotics and/or antimalarials was convenience, since the health facility was far and the local health facilities inadequately equipped. The study was neither specific to first-line antibiotics nor did it explain what the household respondents in Nyalenda B knew about the antibiotics they self-medicated with. Moreover, the type of dosage form the respondents preferred for the antibiotics and whether the respondents adhered to the advice on how to use the antibiotics was also ignored.

According to Sifuna, Njagi, Okemo, Munyal, Orinda and Kariuki (2008) resistance to first-line antibiotics such as Tetracycline, Cotrimoxazole and Penicillin was reported in Jubilee, Kibuye, Kondele, Nyalenda and Manyatta markets in Kisumu. The highest level of resistance was detected against Cotrimoxazole (38.76 percent). E. coli resistant bacteria was higher in fish samples in Jubilee and Kondele markets which were classified as high-risk sources. Despite the fact that these findings suggest a real health risk through consumption of fish, consumers' knowledge about the use of the antibiotics and their beliefs and perceptions were not addressed. The study also fell short of describing the methods that the residents of these markets considered as appropriate for learning about proper use of first-line antibiotics. Use and misuse of antibiotics in Manyatta 'A' sub-location has been characterized by the existence of both registered and non-registered drug outlets where antibiotics are bought with or without prescription (Ministry of Health, World Health Organization & Health Action International, 2004). Resistance to antibiotics such as tetracycline, cotrimoxazole and penicillin have also been reported in Manyatta markets in Kisumu (Sifuna *et al.*, 2008).

1.2 Statement of the Problem

Antibiotics misuse by patients results in increased prevalence of communicable diseases and drug resistance leading to wasting of resources and increased morbidity and mortality. However, few studies exist to explain the behavioral factors associated with the rising trend of antibiotics resistance in Kisumu County. Although antibiotics resistance is primarily a medical problem, the factors that influence the spread of resistance are social, cultural, economic, ecological and epidemiological. In Manyatta 'A' sub-location, focus has been on resistance and prescribing patterns of antibiotics, prevalence of

self-medication with antibiotics and antimalarials within clinical settings. However, despite the increased interest in antibiotic utilization, not much research has been conducted on the socio-cultural context of first-line antibiotics use in Manyatta 'A' sub-location, especially from the perspective of consumers. Failure to understand the socio-cultural perspective of medication with antibiotics leads to inadequate communication about antibiotics use and inappropriate use. This means that the problems resulting from antibiotics misuse cannot be mitigated at community levels.

Few studies in Manyatta 'A' sub-location have holistically focused on how consumers' knowledge on first-line antibiotics influence their use, consumers' beliefs and perceptions that influence antibiotics seeking behavior and; methods appropriate for consumers for learning about proper use of first-line antibiotics. Specifically, consumers' knowledge on the indications of antibiotics; source of advice for acquisition of antibiotics; purpose of purchasing the antibiotics and knowledge on the effects of inappropriate use of antibiotics have not been fully explored. Specific aspects of consumers' beliefs and perceptions have also been largely ignored. These include perceptions on preferences for dosage forms of first-line antibiotics; types of requests and acquisitions of first-line antibiotics and whether consumers' adhere to advice of healthcare workers concerning how to use the antibiotics and; the consumers' views about proper use of the antibiotics as well as the methods that they would prefer for educating them about the use of first-line antibiotics. Accordingly, a proper health care management system should integrate patterns of belief about causes of illness and norms governing choice and evaluation of treatment. This has not been the case in most antibiotics utilization intervention studies. Hence, the strong need to examine the socio-cultural factors in the utilization of first-line antibiotics in Manyatta 'A' sub-location.

1.3 Research Questions

This study was aimed at addressing the following research questions:

- i) What is the knowledge about the use of first-line antibiotics among pharmacy clients' in Manyatta 'A' sub-location?
- ii) How do the pharmacy clients' beliefs and perceptions influence their behavior on use of first-line antibiotics in Manyatta 'A' sub-location?

- iii) What are the methods preferred by the pharmacy clients for learning about the use of first-line antibiotics in Manyatta 'A' sub-location?

1.4 Objectives of the Study

The study examined the socio-cultural factors in the utilization of first-line antibiotics in Manyatta 'A' sub-location.

Specifically, the study:

- i) Explored the knowledge about use of first-line antibiotics among pharmacy clients' in Manyatta 'A' sub-location.
- ii) Analyzed the pharmacy clients' beliefs and perceptions that influenced the behavior on use of first-line antibiotics in Manyatta 'A' sub-location.
- iii) Appraised the methods preferred by the pharmacy clients for learning about the use of first-line antibiotics in Manyatta 'A' sub-location.

1.5 Justification of the Study

A study on the socio-cultural context of first-line antibiotics use in Manyatta 'A' sub-location was appropriate because Manyatta 'A' sub-location is characterized by both formal and non-formal drug outlets where antibiotics are bought with or without prescription (Kenya Ministry of Health, World Health Organization & Health Action International, 2004). Resistance to first-line antibiotics such as tetracycline, cotrimoxazole and penicillin has also been reported in markets in Manyatta. This study therefore provided insights on behavioural factors that catalyze the misuse of first-line antibiotics in the region.

The study adds to the existing body of knowledge available on the topic of antibiotics use. Specifically, it is an important contribution to the scholarly research and literature on the sub-fields of medical anthropology. This is because it provides valuable knowledge on the anthropology of pharmaceuticals. Thus, in principle, the study has potential to encourage the interest of diverse readership within the field of social science and medicine.

The study addresses an important issue relating to the health risks associated with the use of first-line antibiotics among populations living in low income settings. The subject matter of the study is therefore relevant for the pharmaceutical policies and practices in

relation to the use of first-line antibiotics. This is because from the perspective of the Kenya National Drug Policy, rational drug use is mainly geared towards the formal health care services and most studies are biased towards this leaning.

Since research is a process, this study can provide a spring board for further research on how to plan and integrate programs on rational antibiotic use into existing preventive strategies especially in low income settings.

1.6 Scope and Limitation

The study was geographically confined within Manyatta 'A' sub-location, Winam Division, in Kisumu City. The study focused on first-line antibiotics use behavior by consumers and not on clinician prescribing behavior.

The nature of the study population demanded that all the pharmacy clients who purchased any category of first-line antibiotics, chief pharmacists and pharmacy clerks be categorized as difficult to find population. In line with this methodological consideration, it was therefore not possible to adopt a random sampling strategy in the selection of pharmacy clients, chief pharmacists and pharmacy clerks due to lack of physical list and a distinct sampling frame. On the other hand, the household follow-up interview study generated primarily qualitative data. Hence, the findings of the study could not be generalized to the entire population of Manyatta 'A' sub-location.

The pharmacy study interview reflected on prescription and dispensation of drugs by the pharmacy personnel. This led to suspicion and a change in behavior by the pharmacy personnel in the presence of the interviewer. This could have affected the validity of the data collected. However, the interviewer built rapport with the respondents and explained the importance of the study.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter reviewed literature on the social and cultural factors regarding the use of antibiotics. It highlighted the key themes and issues pursued in the study. It includes literature on consumers' knowledge on the use of antibiotics; beliefs and perceptions that influence consumers' behavior of antibiotics use and; the preferred methods of education on appropriate use of antibiotics. The chapter also presents the theoretical framework used in this study.

2.1.1 Consumers' knowledge on use of first-line antibiotics

Antibiotics have been used in excess in the world such that only 25% of patients with respiratory illnesses had any bacterial etiology (Gonzales *et al.*, 2001). Worldwide, antibiotics such as amoxicillin, cotrimoxazole, erythromycin, ampicillin/cloxacillin, metronidazole, neomycin, tetracycline and cephalexin have been frequently used indiscriminately and often misused (Marliere *et al.*, 2000; Orero *et al.*, 1998; Van Dong *et al.*, 1997).

Members of an ethnically diverse community in the United States believed antibiotics were effective for colds, were very likely to seek care for colds, and often obtained antibiotics without a prescription. Indeed, lay knowledge of appropriate treatments for infections may be inconsistent with available evidence of effective treatment (McKee, Mills, & Mainous, 1999). Other studies in the United States have shown that treatment indication, choice or duration of antibiotic therapy was incorrect in 30% to 50% of cases (CDC, 2013; Luyt *et al.*, 2014). Patients understand their illnesses within their own conceptual framework which includes their own beliefs, thoughts and feelings. They process that information and then make their own decisions and act (Kleinman, 1980).

Important socio-cultural factors captured in the studies (McKee *et al.*, 1999; CDC, 2013; Luyt *et al.*, 2014) include beliefs in the effectiveness of antibiotics to treat respiratory illnesses and acquisition without prescription. This perceived knowledge on treatment indication with antibiotics and acquisition without prescription point to misuse of the antibiotics. However, knowledge of patients on effects of frequent and inappropriate use were not exposed.

A comparative European study has shown that respondents from Lithuania were significantly less knowledgeable of antibiotics, compared with such countries as Sweden, Belgium, Austria, and the Netherlands (Grigoryan, Burgerhof, Degener, Deschepper, Lundborg, Monnet, Scicluna, Birkin, & Haaijer-Ruskamp, 2007). A study by Pavydė, Veikutis, Mačiulienė, Mačiulis, Petrikonis and Stankevičius (2015) in Lithuania revealed important findings related to inadequate public knowledge of antibiotics. Results showed that antibiotic knowledge among Lithuanian population was insufficient as almost two-thirds (n=1005) of the respondents (61.1%) had poor knowledge of antibiotics. A large proportion of the respondents (41.7%) thought that antibiotics worked on common cold, 26.0% that antibiotics were effective in treating viral infections, and 21.7% that antibiotics were effective in treating mixed (bacterial and viral) infections. In spite of the large sample size and high response rate (77.3%), several limitations of the study by Pavydė *et al.* (2015) should be noted. As the study was based on a self-administered questionnaire, the data were presented from recollection of respondents' memory, and, thus, subjectivity would be possible in some cases. Other limitations include education level and previous use of antibiotics being self-reported. Nevertheless, the study revealed a high percentage of inappropriate antibiotic knowledge and a high rate of self-medication with antibiotics among Lithuanian population.

Results of a European Commission (2013) survey showed that most Europeans (84%) were aware that unnecessary use of antibiotics makes them become ineffective; two thirds (66%) knew that frequent use of antibiotics can lead to side-effects and 41.3% believed that antibiotics kill viruses as well as bacteria. This finding is consistent with survey data in the United States which showed that 45% of adults who used an antibiotic believed that antibiotics can effectively treat viruses (Boyd *et al.*, 2008). These findings are significant because they demonstrate knowledge on not only the effects of misuse of antibiotics but also perceived knowledge on the treatment indication of antibiotics though in different geographical context. A limitation of the studies by the European Commission (2013) and Boyd *et al.* (2008) on antibiotics use is the paucity of information on the participants sources of advice for acquisition of the antibiotics. This is a key variable on knowledge about antibiotics use. Indeed, Kleinman (1978) posits the role of social networks notably family and neighbours in influencing the explanatory model that individuals employ when ill.

Insufficient public knowledge of antibiotics has also been previously reported in other countries in Europe including Italy (Napolitano, Izzo, di Giuseppe, & Angelillo, 2013), Poland (Godycki-Cwirko, Cals, Francis, Verheij, Butler, Goossens, Zakowska, & Panasiuk, 2014), and Macedonia (Ivanovska, Zdravkovska, Bosevska, & Angelovska, 2013).

A study conducted in the United States concluded that patient knowledge on antibiotics use is related to and affects other factors such as compliance, attitudes, and behaviors (Niemchick, 1999). This can also be seen in a study conducted by Pechere (2001) which evaluated patient contribution in antibiotic use where subjects (5379) from 9 countries including the United Kingdom, France, Belgium, Italy, Spain, Turkey, Thailand, Morocco and Colombia were questioned. Patients believed that most respiratory infections except the common cold required antibiotic therapy and 11% of them exaggerated their symptoms to get an antibiotic prescription from their physician. Comparatively, mothers concerns about their children taking antibiotics for fear of side effects differed from country to country with more concerns in Colombia (75%) and Turkey (64%), less in Thailand (28%) and Spain (14%) (Pechere, 2001). These findings show that patient lay knowledge has a direct influence on patient use and behavior concerning antibiotics. The results also indicate an obvious misuse of antibiotics where patient demand for antibiotics influenced prescription patterns. However, Pechere (2001) study did not indicate whether the patients had any knowledge about the effects of inappropriate use of the antibiotics. According to Kleinman (1980), patients' health knowledge may deviate from biomedical concepts due to patient's health beliefs.

Smaglik (1997) also placed equal responsibility for overprescribing on patients and a health care system that emphasizes treatment over education. The misuse of antibiotics in the study by Pechere (2001) is associated with the belief in the efficacy of antibiotics to treat most respiratory infections which leads to demand for wrong prescription. This factor accounts for professional health sector's inadequacy in ensuring proper diagnosis and prescription. The statistics suggest that dynamics in antibiotics use in different countries are not similar. However, the results reveal that aspects of knowledge such as knowledge on treatment indication and side effects of antibiotics are cross-cutting, albeit in varying contexts. After examining the different themes explored in the study, it appears

that information on the source of advice for the acquisition of the antibiotics was not included.

Comparatively, Yu, Genming, Cecilia, Yipin, Qi and Biao (2014) study of primary caregivers bringing children to a clinic for vaccinations in two rural Counties in central China did not also establish the sources of advice for acquisition of antibiotics. Accordingly, Yu et al. (2014) found that although 61% of parents believed that antibiotics are overused in China, 45% of parents considered it reasonable to request antibiotics directly from physicians and 53% said they would not be dissatisfied if physicians rejected their request for antibiotics. It is commonly argued that patients in China demand antibiotics even when they are unlikely to be effective (Sun, Sukham, Gordon, & Adrian, 2009; Wang, Niannian, Haidi, Shuman, Hua, & Zhanchun, 2013). These results show that parents are knowledgeable (perceived or not) about treatment indications for antibiotics hence the demand for prescriptions from physicians. The findings suggest that physician prescribing habits can be further understood when patient expectations are taken into account.

The role of reference groups as sources of advice for acquisition of antibiotics has been explored in Philippines, India, Mexico and Brazil where drug store customers based their decisions to buy antibiotics on advice that was given by friends or relatives (Calva, 1996; Dua et al., 1994; Lansang *et al.*, 1990; Schorling de Souza & Guerrant, 1991). These findings supported results of another study in Jordan which showed that 51.8% of adult Jordanians used antibiotics based on a relative's advice. Moreover, 67.1% of the respondents believed that antibiotics treat common cold and cough (Shehadeh, Suaifan, Darwish, Wazaify, Zaru, & Alja'fari, 2011). This also agrees with a study by Lau, Lee, and Luk (1995) which assessed self-medication practice in a rural area in Malaysia. The findings of the study showed that during an illness episode, patients commonly sought information and advice from a lay referral or therapy management group. This group affects self-diagnosis and treatment by contributing knowledge gained through experience and by sharing of medications. However, the knowledge on specific health effects of inappropriate antibiotics use remained largely unexplored in several studies (Calva, 1996; Shehadeh *et al.*, 2011; Schorling de Souza & Guerrant, 1991; Lau *et al.*, 1995).

In contrast, a study by Calva and Bojalil (1996) in a peri-urban community in Mexico City described the pattern of antibiotic use but paid little attention to the sources of advice for acquisition of antibiotics. It however highlighted specific aspects on knowledge on antibiotics use. Accordingly, the drugs most commonly reported were penicillins, erythromycin, metronidazole, neomycin, cotrimoxazole and tetracyclines. Antibiotics were the majority (29%) of the drug sales and the main perceived reasons for antibiotic use were acute respiratory tract ailments and gastroenteritis. Interviewees reported that antibiotic therapy was given in 27% of respiratory diseases and in 37% of all diarrheal episodes.

Public knowledge and attitudes towards antibiotic usage was examined in a cross-sectional study among the general public in the state of Peng in Malaysia. According to the results of the study, nearly 55% of the respondents had a moderate level of knowledge. Three quarters of the respondents (76.7%) could correctly identify that antibiotics are indicated for the treatment of bacterial infections. However, 67.2% incorrectly thought that antibiotics are also used to treat viral infections. About 59.1% of the respondents were aware of antibiotics resistance phenomena in relation to overuse of antibiotics. With regard to attitudes, 38% believed that taking antibiotics when having a cold symptoms could help them recover faster (Oh, Hassah, Al-Haddad, Sulaiman, Shafie, & Awaisu, 2011). These results are important in bringing out lay knowledge on antibiotics use such as the perceived knowledge on treatment indication of the antibiotics and knowledge on effects of overuse of antibiotics. A limitation of the study was its inability to show who provided the respondents with the advice on which antibiotics to acquire for the treatment of the illnesses.

The behavior, attitudes, and knowledge about antibiotic usage among adult residents was surveyed in Changhua County, Taiwan and the study concluded that residents had inadequate or incorrect knowledge about antibiotic usage. The findings of the study indicated that only 39.2 percent (n= 1024) of subjects had knowledge about basic antibiotic terminology; 15.3 percent of subjects always requested an antibiotic prescription when they suffered flu-like symptoms; 27.1 percent of subjects lacked knowledge about how to deal with the misuse of antibiotics; and 30 percent of the subjects did not know how to obtain information about antibiotic usage (Chen, Chen, Hwang, Lin, Yang, Tsay, Liu & Young, 2005). Requesting for antibiotic prescription

when the residents in the Taiwan study suffered flu-like symptoms is an indication that patient pressure is a reason for the prescription of antibiotics. According to Orr, Scherer, Macdonald and Moffatt (1993), prescribing antibiotics for the treatment of flu-like symptoms enhances belief that antibiotics are effective and raises antibiotic consumption. Doctors seem aware of this dilemma and are willing to identify inappropriate use of antibiotics for lower respiratory tract illness, but the practice nevertheless continues.

A study on social factors influencing the acquisition of antibiotics without prescription in Kerala State in India showed that people least likely to self-medicate were from higher income families, having more education and higher status occupations and receiving the benefits of medical insurance (Saradama, Higginbotham & Nichter, 2000). This concurs with the findings of a study in a community of Khartoum state which revealed that the practice of self-medication was most common among people of higher socio-economic status (Awad et al., 2005). The role of socio-demographic characteristics in antibiotics utilization are exemplified as the major factors associated with self-prescription of antibiotics in India and Sudan (Saradama *et al.*, 2000; Awad *et al.*, 2005). Even though antibiotics resistance is a current problem particularly in developing countries (Chalker, 2001), a major limitation exists concerning knowledge of consumers on the effects of inappropriate use of antibiotics. Although you cannot compare the geographical contexts of antibiotic use in the aforementioned studies, they are informative in terms of providing important socio-cultural factors such as the role of demographics in antibiotic use.

In public health facilities in Kenya, patients' knowledge of when and in what quantity each medicine should be taken was examined. Results showed that more than 75 percent of patients in 47 health facilities knew how to take their medicines. In 27 percent of health facilities, less than half of the patients knew how to take their medication. In this study (Ministry of Health, 2009), sampling was done only in public health facilities leaving out community based pharmacies which provide a significant part of pharmaceutical services. Moreover, antibiotics use within household setting was not given prominence in the survey. The focus on one sector of the health care system, that is the professional sector gives primacy to the physical explanatory framework of biomedicine (Kleinman, 1980). The controlled environment of the health facility rather

than the natural setting of community pharmacies and households imposes values on the patients' knowledge and perceptions of their problems.

2.1.2 Beliefs and perceptions that influence antibiotics use behavior

How people communicate about their health problems, the manner of presentation of symptoms, when and to whom to go for care, how long to remain in care and how to evaluate that care are all affected by cultural beliefs and perceptions (Haak & Hardon, 1988). Perception entails people's worldviews, knowledge and meanings that they attach to phenomena and the definition they offer (Brown, 1989). The perception one has about a situation or phenomenon normally guides the actions one takes regarding the situation (Hare, 1996).

In this context, a study conducted in the United Kingdom, found that exploring how patients' antibiotic drugs worked for them was effective in revealing their beliefs about medicines, and often led naturally to a candid account of actual use (Dowell, Jones, & Snadden, 2002). Consequently, an interview with consumers in Wales in the United Kingdom found that both perceived importance and personal threat with regard to antibiotic resistance were low. Respondents believed that it made sense to stop taking antibiotics as they started to get better (Hawkings *et al.*, 2008). The types of requests, self-medication with the antibiotics such as acquisition without prescription were not established. The findings nevertheless acknowledges the consumers' perceptions about non-severity of the illness as a factor in non-compliance to the antibiotics treatment regimen. World Health Organization (2003) points out that compliance is the patient's adherence to a drug regimen. If the steps of diagnosis, prescription, and dispensing of medical treatment are correctly followed, the most important part of rational drug use, the key determinant role, is the acceptance of therapy by patient. Patients' information about the purpose of the drugs that have been prescribed for the patient can decrease compliance errors.

Indeed, in the United States, patient use and behavior concerning antibiotics was related to patient knowledge (Niemchick, 1999). This can also be seen in a study conducted in Great Britain which suggested that 50% of patients were non-compliant with the dosage of their prescribed antibiotics. According to the results, 51% of medicines in the household were not currently being used and 40% of the medications found at home had

expired (Mackridge & Marriott, 2007). Another survey indicated that each year nearly 33% of the population of England could not complete the course of a prescribed drug regimen. In addition to this, nearly 25% of adults surveyed in the same study admitted to having unused antibiotics in their homes (De Bolle, Mehuys, Adriaens, Remon, Van Bortel, & Christiaens, 2008).

Results of the studies by Mackridge and Marriott (2007) and De Bolle *et al.* (2008) revealed an important aspect in antibiotic seeking behavior. That is hoarding of antibiotics in households, a practice that encourages non-adherence to the antibiotic regimen. Nonetheless, the studies failed to indicate whether the antibiotics that were kept in the households were in form of capsules, tablets or liquid preparations. The perceptions that influence the preferences of household members to these dosage forms were also not established.

To find out how prevalent household antibiotic storage was in Spain, results showed that of 1000 households, 42% contained one or more antibiotics. Only 19% had a person in the house currently under physician care with antibiotics (Burshardt, Massey, Simpson, Ariail, & Simpson, 2008). This showed an obvious misuse of antibiotics. Patients thought it was perfectly acceptable to hoard or keep some for later use. According to Mireles (2007), hoarding is defined in cases where multiple drugs are retained in the home, particularly when drugs are no longer needed or had expired. It is a habit that can cause unused drugs to build up in the home leading to wastage of the medication. Medication wastage is any drug product, either dispensed by a prescription or purchased over-the-counter that is never fully consumed. This phenomenon may be because of the patients' poor compliance, excessive and irrational prescribing, or the lack of control over the sales of prescription medications in the community pharmacy (Celik, Poyraz, Sencan, & Clark, 2010). Medicine wastage not only causes unnecessary economical loss in the health system, it also causes environmental pollution if the drugs are not disposed of properly (WHO, 2003). Non-adherent drug consumers who want to save drugs for later use may lack the knowledge that either drugs can be spoiled or expired during storage. Moreover, their illnesses may be different than the previous ones although symptoms may appear to be similar (Kamat & Nichter, 1998).

Burshardt *et al.* (2008) findings are an indication that patients' behavior concerning the use of antibiotics did not correspond with agreed recommendations from a health-care provider. Hoarding antibiotics in the house, given the effects of the practice (Mireles, 2007), is an indication that the steps of diagnosis, prescription, and dispensing of medical treatment occurred within the context of the popular health care sector. The treatment activities by the households members relating to the antibiotics can be located within lay explanatory model and its subsequent popular health care sector. According to Kleinman (1980), the healing activities in the popular health care sector involves lay representations of illness and cure since each culture prescribes a set of beliefs and practices for its members regarding health maintenance. The popular health care sector includes the self-medication of lay people or the use of social networks to choose treatment. Beliefs and perceptions regarding the behavior of self-medication with antibiotics was however not given prominence in the study by Burshardt *et al.* (2008).

Self-medication is defined as the utilization of drugs to treat self diagnosed disorders or symptoms, or the irregular or continuous use of a prescribed drug for chronic or repeated diseases or symptoms. A major deficit of self-medication is the lack of clinical assessment of the condition by a qualified medical professional, which could result in overlooked diagnosis and hindrances in appropriate treatments (WHO, 2000).

Results of a study in Scotland indicated that 57% (n=605) of patients consulted a doctor and were prescribed antibiotics and 75% believed in the efficacy of antibiotics to treat sore throats and influenza (Emslie & Bond, 2003). These findings demonstrate knowledge, beliefs and behaviors among consumers which influenced their antibiotic usage. The results acknowledge the confidence of the members of the public about the perceived efficacy of antibiotics. However, knowledge gap exists concerning patients' types of requests for the antibiotics and perceptions about preferences for dosage forms of antibiotics.

Self-medication with antibiotics was further reported in southern and Eastern European countries (Grigoryan, Haaijer-Ruskamp, Burgerhof, Mechtler, Deschepper, & Tambic-Andrasevic, 2006; Mitsi, Jelastopulu, Basiaris, Skoutelis, & Gogos, 2005). This unsuitable use may contribute to antibiotic resistance which is reaching alarming levels in Southern and Eastern Europe (Guillemot, Carbon, Balkau, Geslin, Lecoer, & Vauzelle-

Kervroëdan, 1998; Mayor, 2005). In Turkey, patients can buy many medications without a prescription. However, 70% of the people with health insurance preferred to consult a doctor and applied pressure on the doctor to write prescription which included the antibiotics the patient wanted. This pressure was often exerted to make the doctor prescribe drugs that were believed to be useful just in case they may be needed (Braund, Ching, & Jung, 20007).

Some studies in the USA have also revealed considerable self-medication with antibiotics obtained from leftovers from previous courses, at a local pharmacy or outside the country (Richman, Garra, Eskin, Nashed, & Cody, 2001; McKee, Mills, & Mainous, 1999; Vanden Eng, Marcus, Hadler, Imhoff, Vugia, Cieslak, & Besser, 2003). Other studies in the United States demonstrated that recent immigrants from Latin American countries, where antibiotics are available over-the-counter, had the greatest expectations for antibiotics for upper respiratory tract infections. Self medication performance varied significantly with a number of socio-economic characteristics, cultural beliefs and a lack of health insurance which were other possible determinants of self-medication with antibiotics for the immigrants (Mainous, Cheng, Garr, Tilley, Everett, McKee, 2005; Corbett, Gonzales, Leeman-Castillo, Flores, Maselli, & Kafadar, 2005). Mainous, Diaz, and Carnemolla (2008) also explored Latino adults' experience in treating common infections particularly in regards to self-medication with antibiotics in the United States. Results of the study showed that patients believed that physician visits for a diagnosis and prescription was unnecessary when the patient was familiar with the symptom and it had previously responded to antibiotic treatment.

The above studies provide valuable information regarding the cultural aspects in antibiotics utilization, especially in describing behaviors and perceptions on antibiotics use in Western countries. Caution needs to be exercised before applying these results to Asian, latin American and African countries. One should not assume the results obtained from studies in developed countries can be generalised to developing countries since dynamics in drug use differ globally.

Studies in developing countries have documented the prevalence of self-medication with commonly utilized antibiotics at 10% (n=314) in Palestine (Sawalha, 2007) and 81.8% in Jordan (Sawair, Baqain, Abu & Abu, 2009). This is a very high percentage, however this

finding is consistent with another study of self-medication with antibiotics in Yemen. Results showed that 1200(60%) of patients had taken an antibiotic in the last fifteen days without a medical prescription. Patients 312(26%) used the previous prescription paper to obtain antibiotics, while 74% obtained antibiotics from pharmacies and drug stores without any prescription required. The results showed that female (58%) children were more exposed to self-medication than males (42%). This was 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). The type of request for antibiotics in the study was indicated by the use of previous prescription paper to obtain antibiotics. This probably may lead to many problems, in addition to the misuse of antibiotics, the cost may be augmented. A shortcoming of the study was the failure to document the perceptions of patients that influenced their preferences for the antibiotics in either capsules, tablets or liquid preparations dosage forms.

The risk of buying antibiotics without a script in Kerala state in India was associated with the perception that it was expensive to consult a doctor and low satisfaction with medical practitioners (Saradama *et al.*, 2000). A study among adult Jordanians showed that 49.0% (n=477) of the respondents used left-over antibiotics without physicians' consultation (Shehadeh *et al.*, 2011). This finding reiterate the respondents' perceived knowledge on the use of the antibiotics and also brings to the fore antibiotic use behavior such as hoarding of antibiotics for future use.

Anthropologists have highlighted the use of antibiotics in reference to local conceptualizations of causality of illness as well as locally correct modes of healing (Chandler, & Hutchinson, 2016). This is depicted through explanatory models, which describe cultural ideas about illness and ways to understand and negotiate different perspectives of ill-health and misfortune (Kleinman, 1970). For example, Mark Nichter's ethnographic work in the Philippines provides a rich description of preventive and protective antibiotic use by patrons of sex workers. The patrons variously took antibiotics before sex, after sex, occasionally or routinely depending upon their own situations and familiarity with the particular sex worker (Nichter, 2001). Cultural beliefs about antibiotics such as the notion that there is a pill for every symptom are also exemplified by other studies in the Philippines. Results showed that antibiotics were believed and used

to prevent diarrhea after eating suspected contaminated foods (Lansang *et al.*, 1990; Abellanosa & Nichter, 1996).

These accounts have illustrated diversity in perceptions and behaviour on antibiotic use both between and within settings. These findings often draw contrasts with international standardised guidelines, demonstrating a gap between local and global perspectives of what is appropriate, rational and proper. According to (Nichter, 2008), medicine has been found to be a personal issue in many cases; what works for one person might not for the next and ways of taking medicines would need to be experimented with on a case by case basis. Bibeau (1997) further contends that in casting lay knowledge and behaviours regarding medicine use as misguided, the assumption of the primacy of medical scientific knowledge in how best to use these medicines is retained. Furthermore, the assumption of the implicit dichotomy of biomedical knowledge as true and local knowledge as belief is also reiterated. The cited studies (Saradama *et al.*, 2000; Nichter, 2001; Mohanna, 2010; Shehadeh *et al.*, 2011) draw the reader's attention to the fact that in most developing countries, antibiotics can be purchased without prescription which is a key socio-cultural factor in antibiotic utilization. However, patients' compliance to the antibiotic regimen and the beliefs and perceptions that drive non-compliance remained largely unexplored.

Several factors have been documented to account for the reasons for non-compliance to antibiotic regimen by patients. In Mexico, poor patient physician communication was partially responsible for the non-compliance of patients with antibiotic regimens (Reyes, Guiscafre, Munoz, Perez-Cuevas, Martinez, & Gutierrez, 1997). Physician-patient interactions are often inadequate for example; a mean of 54 seconds was recorded in a Bangladeshi study (Guyon, Barman, Ahmed, Ahmed, & Alam, 1994). Moreover, in rural Africa, because patients often traveled long distances and incurred large expenses for medical care, they were unlikely to return for follow-up visits, the patient may also be unable to read medicine labels (Soumerai, 1990).

A study on the pattern of antibiotic use by the public in an urban slum in Nigeria reported non-adherence to a six-hourly dosage regimen of antibiotics. Results showed that 57.39% (n=359) of respondents complied only partially with antibiotic full dose and 6.05% never complied. Reasons mentioned for non-adherence included lack of understanding of dosage instructions by dispensers from the various sources of purchase (86.9%) and

improvement in respondent's health condition (41.2%). The level of self-medication in the study ranged from 44.3% to 79.2% (n=359) for the four most commonly used antibiotics in the community such as ampicillin/cloxacillin, tetracycline, metronidazole and ampicillin (Kehinde & Ogunnowo, 2007). These results point to dispensing system and pharmacist as well as patient related reasons to non-adherence and irrational use of antibiotics. The WHO (2002) asserts that the dispensing of medication is a huge responsibility and a disorganized dispensing and counseling process can be a cause of non-compliance. Pharmacists may advise inappropriate over the counter (OTC) medication consciously (seeking profit) or unconsciously. It is of crucial importance that patients understand what their problem is and what they have to do to apply their therapy. The patients cannot comply with treatments unless they clearly understand the treatment directions. They tend to forget a major proportion of the information which they learnt during consultations with the health care professional.

In most illness episodes, self-medication is the first option (WHO, 2002). Among Nigerian dental students, the prevalence of self-medication with antibiotics was 53.5% and amoxicillin was the most commonly self-medicated antibiotics (Ehigiator, Azodo, & Ehikhamenor, 2010). Hounsa, Kouadio and De Mol (2010) also documented that about one-fifth of all antibiotics purchased from private pharmacies in Abidjan, Ivory Coast were self-medication. The influence of beliefs and perceptions on dosage form preferences and types of requests for the antibiotics were not investigated.

The studies (Kehinde & Ogunnowo, 2007; Ehigiator *et al.*, 2010; Hounsa *et al.*, 2010) were conducted in different ecological and socio-cultural contexts of antibiotic use and comparison of the results to the rest of the sub-Saharan Africa may be problematic. However, the studies are useful because they show aspects of behavior related to antibiotic use such as self-medication and non-compliance to the antibiotics regimen.

Statistics indicate that 45 percent of pharmacy clients in Kenya arrived without prescriptions and requested specific antibiotics (Kwena *et al.*, 2008). Data on socio-demographic characteristics of a study on adult outpatients attending Kenyatta National Hospital showed that most common self-medicating age group was 25-29 years with 25.9 percent while the least self-usage of antibiotics was in those ages below 20 years with 3.5 percent. Educational status of primary or lower, presence of a chronic

illness, negative perception of health status and low income increased the likelihood of self-administration with antibiotics. The most common reasons were to avoid a more serious infection (44.2 percent), avoidance to pay for the physician or tests (29.1 percent) and lack of time to visit a physician (11.6 percent) (Misati, 2010). The study relied on data on antibiotic use from respondents in a public health setting while antibiotics use is also widespread in the private sector.

In drug stores in Kibera, 94 percent of customers or patients requested smaller doses of antibiotics for the management of sexually transmitted infections. Around half of ill patients visiting the hospital previously sought care from informal drug sellers in rural western Kenya (Kwena et al., 2008; Thoithi & Okalebo 2009). These studies are mostly on resistance patterns and on rates of prescription of antibiotics. How the antibiotics were requested by patients from the health care facilities is not known. Furthermore, the beliefs and perceptions that influenced non-adherence to the antibiotics regimen were not examined.

In Nyalenda B sub-location, Kisumu County residents of households perceived self-medication with antibiotics and/or antimalarials as convenient and appropriate and this had an influence on the behaviour of self-medication. The perceptions influencing self-medication were: availability of information through advertisement of antibiotics and or antimalarials and advice given by medical practitioners; distance from the health facility; inadequately equipped local health facilities and sexually transmitted infections (Owuor, Alwar & Oyugi, 2005). The study was primarily quantitative so that the structured questionnaires restricted the respondents to predetermined responses. Respondents' perceptions that influence their preferences for antibiotics in various dosage forms for first-line antibiotics, types of requests and non-compliance to the antibiotics regimen were not investigated. Moreover, the study generalized to antimalarials and not specifically to first-line antibiotics.

2.1.3 Methods of learning about antibiotics use

Educational approaches attempt to inform or persuade prescribers, dispensers or patients to use drugs in the proper, rational and efficient way. There are types of this approach such as in-service training, face-to-face education, small group discussions, seminars, workshops and printed educational materials (Smith, 1996). Patient or consumer

education has an important role in improving irrational use of drugs since inappropriate prescribing patterns may derive from the demands of patients (WHO & DAP, 1997). Interventions geared towards the patient may therefore be an effective means to reduce antibiotics overuse, increasing patients' awareness of the negative aspects of antibiotics and thereby minimizing the pressure on the physician (Thoolena, de Riddera, & van Lensvelt-Mulders, 2011). Increasing the public knowledge is generally seen as the key element of such interventions. An intervention design stresses the importance of clear, consistent messaging and the use of a mix of communications (Belongia & Schwartz, 1998).

To improve the public's knowledge of antibiotics, various national campaigns have been directed to educate the public in developed countries. For example, the European Commission for Disease Control has annually conducted the European antibiotic awareness day since 2008 (Zenner & Shetty, 2011). In the United States, the Center for Disease Control's *Get Smart: Know When Antibiotics Work* has been conducted as well. This campaign reinforces not taking antibiotics for viral infections in order to decrease patient demand and encourages patients to use antibiotics appropriately. It advocates for not skipping doses, not saving antibiotics and not taking antibiotics prescribed for someone else. Huttner, Goossens, Verheij and Harbarth (2010) points out that public campaigns can contribute to the habit of more careful use of antibiotics in outpatients, at least in high-income countries.

The *Get Smart: Know When Antibiotics Work Campaign* is an important educational campaign because it draws attention to the global concerns about antibiotic resistance. However, its major deficiency is that it is focused on prescribing behavior and use of antibiotics within outpatient healthcare settings. It contains a collection of educational tools for use by healthcare providers in family practice, internal medicine, emergency departments, pediatrics and urgent care clinics. These educational tools are full of biomedical terms that is not easily comprehended by the general population within households in the community especially in low income settings in developing countries. Additionally, the campaign does not elicit patients' proposals on how to ensure rational use of antibiotics as well as include the methods preferred by community members to educate them on antibiotics use.

In Canada and France, the European commission has funded antibiotic teaching resource which is a representative educational program for children (Lecky & McNulty, 2011). Patient-oriented educational interventions such as videos and brochures or leaflets significantly improved the knowledge and attitudes about antibiotics in both patients and potential patients in the United States. This significantly reduced antibiotic use, although effects were overall small (Bauchner, Osganian, Smith, & Triant, 2001). The finding that patient-oriented interventions were only moderately successful appears somewhat in contrast to Arnold and Strauss (2005) study in Germany. The study analyzed the effectiveness of professional and patient based educational interventions in improving the selection, dose and treatment duration of antibiotics prescribed by health care providers in outpatient settings. They found that patient-based interventions could be effective, particularly in the form of multifaceted interventions combining physician, patient and public education.

The educational methods in the studies (Bauchner et al., 2001; Arnold & Strauss, 2005; Huttner *et al.*, 2010; Lecky & McNulty, 2011) have been highlighted in the context of countries in Western Europe and North America. Caution should therefore be exercised in generalizing from the conclusions of the studies. While an intervention may work well in one setting, it may not work in another. This suggests the context of the intervention and the process of implementation may be critical in determining success.

Gonzales, Steiner, Lum and Barrett (1998) study demonstrated the effectiveness of programs to reduce the use of antibiotics for acute bronchitis or other upper respiratory infections in Mexico. The most successful intervention was multi-dimensional and included patient mailing, in-office patient educational materials, the use of provider opinion leaders, and provider education. The shortcoming of the intervention study was its inability to appraise these educational approaches from the context of patients at the household level. Community members did not provide suggestions on how appropriate use of the antibiotics should be enhanced.

In India, studies have documented intervention methods to address antibiotic use such as face-to-face education (Santoso *et al.*, 1996) and seminars or workshops (Podhipak *et al.*, 1993). Face to face education or persuasion is a common intervention strategy which consists of interactive group discussions for prescribers and/or patients. The principle of

this method is to talk directly to practicing prescribers and patients about appropriate drug use. Approaches based on face-to-face contact are educational outreach, patient education and influencing opinion leaders (Soumerai, 1990).

A randomized and controlled study aimed to evaluate the impact of public education on the rational use of medicines in Mumbai India. Results of the study showed that the intervention group exhibited a significant improvement in correct knowledge of antibiotic use. Similarly, there was a significant improvement in the attitudes and practices of rational use of medicines including antibiotics. The study concluded that public education led to a significant improvement in rational use of medicines. Information brochure was an effective tool of providing health related education to the general public (Pandey & Chaudhari, 2016).

Most of the studies (Podhipak *et al.*, 1993; Sharma *et al.*, 2001; Gupta *et al.*, 2004; Sharma *et al.*, 2014; Pandey & Chaudhari, 2016) were done mainly in health care facilities where there is relative ease of access and monitoring of medicines use. This is as opposed to the community pharmacies and households in communities where use and misuse of antibiotics is also practiced. Additionally, entertainment for education strategies such as door to door campaigns and social gatherings were not analyzed as part of educational approaches aimed at promoting rational antibiotics use.

An educational intervention in the form of small group discussions was introduced in a study group to improve the appropriate use of antibiotics in 32 dispensaries and 7 hospitals in Delhi. The findings of the study showed that though antibiotic use declined after intervention, there was a need for such interventions regularly to bring about long-lasting changes in prescribing behaviour (Sharma, Gupta, Chaudhury, & Bapna, 2014). Podhipak *et al.* (1993) study was however limited to interventions on treatment practices of diarrheal diseases among pharmacists and drug sellers. It did not focus on the methods preferred by consumers for educating them about proper use of antibiotics.

Two effective educational interventions for improving patient knowledge about the correct use of drugs prescribed to them have been demonstrated in India. A study was conducted in Delhi by Sharma, Gulati and Rishi (2001) on the impact of educational interventions on patients' knowledge about correct daily dose. Educational interventions

such as patient counselling and patient information leaflets were employed. Results of the intervention showed that improving the labelling process increased dispensing time. It also increased patient knowledge and thus increased the likelihood of compliance at home. Gupta, Sharma and Sheth (2004) study on the other hand concluded that the use of educational interventions such as patient counselling and patient information leaflets led to improvements in drug dispensing and use by patients.

A small group discussion as an educational approach attempts to explore the underlying causes of irrational use of drugs. Results are then used to develop specific interventions (Quick, Laing, & Ross-Degnan, 1994). A study done in Indonesia showed that the educational approach of a small group discussion was an effective educational method in improving irrational use of antibiotics in acute diarrhea. Also, on site small-group face-to-face educational intervention had greater impact in reducing the inappropriate use of antibiotics than a large-group formal seminar away from the work-site (Suryawati, 1993).

Similarly, an interactive group approach has been used with community members in Indonesia as an educational method on antibiotic use. Groups of mothers were taught how to review drug package inserts and make decisions about informed purchasing of over the counter (OTC) drugs. This step led to a change in the patterns of antibiotics purchases. As a result of the small group intervention, families reduced their monthly purchase of brand name antibiotics compared with a seminar group. The impact of these educational interventions stems from the powerful forces generated during group discussions. Members of the group absorbed group norms and were motivated to change their practices more profoundly than in a passive learning environment (Suryawati & Santoso, 1997).

Since most people purchase their drugs from unqualified drug sellers, educating drug sellers would probably be more beneficial for public health in many low-income countries in Africa (Viberg, Kala, Mujinja, Tomson, & Lundborg, 2007). Concurrently, the need to educate patients on the dangers of self-medication is acknowledged by Omolase *et al.* (2007) who examined the proportion of general out patients in a Nigerian Community hospital who practiced self-medication. This also included the reasons for resorting to self-medication. The study recommended that health care providers should educate patients on the dangers of self-medication. Those messages should be extended

periodically to the community by government health ministries. What remained to be identified was how such messages on the dangers of self-medication could be disseminated to the patients through educative methods that are preferred by patients. Printed materials including posters are the most common and least expensive type of educational interventions. Printed material can be posted on health centers and hospital walls, and personally handed to prescribers and patients. Scientific literature, pharmacy and therapeutics newsletters, and printed guidelines are examples of printed materials used as interventions (Soumerai, 1990). Consequently, educative methods like visual aids and advanced organizers were found to cause considerable improvement in patient compliance to antibiotic treatment in Cameroon (Ngoh & Shephard, 1994). However, patients' proposals towards rational use of antibiotics were not elicited and analyzed.

Visual aids are instructional devices such as a chart, map, posters or model that appeals chiefly to vision. If a visual aid is not properly designed for its intended use and audience, it can lead to a breakdown in communication especially if the language is too complex (Brown, Angus, Marin, Balmes, Barker, Ewart, Halbower, Lutz, Mularski, Nathanson, Mark, Stewart, & Upson, 1994). In Uganda for instance, the impact of public health education on appropriate use of antibiotics through posters was not successful as the messages were not correctly understood (Adome *et al.*, 1996). Standard treatment guidelines have also been used to address inappropriate antibiotic use in Uganda (Nabiswa *et al.*, 1993). Knowing and understanding the context of drug use situation is crucial in order to be able to evaluate the impact of an intervention (Le grand, Hogerzeil, & Haaijer-Ruskamp, 1999). A limitation in the studies (Soumerai, 1990; Nabiswa *et al.*, 1993; Ngoh & Shephard, 1994; Adome *et al.*, 1996; Omolase *et al.*, 2007) is the lack of information on the theoretical background of the interventions. Explicit consideration of theories on health behavior relating to antibiotics use was absent in the studies. Choices involving the type of information and the way it should be communicated to (potential) patients appeared to be based on common sense rather than on theory. An easy comment would be the difficulty in these interventions to successfully assist in reducing antibiotic use because they did not incorporate theories of health behaviour.

A study from Kenya showed that small-group training of counter attendants and one-on-one interactions with pharmacists could also improve diarrhea treatment in private pharmacies, reducing sales of antibiotics. After training, there was a significant increase

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A study from Kenya showed that small-group training of counter attendants and one-on-one interactions with pharmacists could also improve diarrhea treatment in private pharmacies; reducing sales of antibiotics. After training, there was a significant increase in knowledge about diarrhea. Antidiarrheal sales declined by an average of 15 % in Kenya and there was a trend toward improved communication (Ross-Degnan, Soumerai, Sutoto, Goel, Bates, & Makhulo, 1996).

There has been a focus on antibiotics use interventions within the clinical settings (Nabiswa *et al.*, 1993; Adome *et al.*, 1996), targeting prescribing for respiratory infections or diarrhea, usually in children (Ross-Degnan *et al.*, 1996). The studies (Podhipak *et al.*, 1993; Santoso *et al.*, 1996; Suryawati, 1993; Ngoh & Shephard, 1994; Ross-Degnan *et al.*, 1996) did not explore patients' proposals towards proper use of first-line antibiotics. Furthermore, the intervention studies were not based on baseline data on existing antibiotic use. For effective interventions, insight was needed in the socio-cultural context in which inappropriate antibiotics use took place.

2.2 Theoretical Framework

The study was conceptualized and executed through Arthur Kleinman's (1980) explanatory model of health and illness. *Explanatory Models (EM) are the culturally specific logics of disease, a narrative understanding of what illness is and what can be expected from it. This logic shapes perceptions of and interactions with the culturally constructed and socially organized, lived experiences of illness.*

Kleinman rejects the physicalistic reductionism of the biomedical model and replaces it with the following scheme: disease, which refers to abnormalities in the structure and/or function of organs and organ systems, pathological states whether or not they are culturally recognized that is the biomedical model; illness, which refers to a person's perceptions and experiences of certain socially, disvalued states including but not limited to disease; and sickness, which is a blanket term to label events involving disease and/or illness. According to Kleinman, medical anthropologists need to remember that their domain is sickness, even though their special contribution will be mainly with regard to illness (Kleinman, 1988).

As a set of beliefs, the Explanatory Model of health and illness contains any or all of the following five elements: etiology or cause of the infection; onset of symptoms; pathophysiology or the functional changes associated with or resulting from disease or injury; course of sickness that is severity or type of sick role; and treatment. These five issues provides a framework for people to explain how they view their illness. This is in terms of how it happens, what causes it, how it affects them, and what will make them feel better or how one should seek treatment for this disease (Kleinman,1978). Explanatory model guides people on how they should act when confronted with illness and how to respond to disease. At the onset of an illness, people organize their symptoms and signs into a recognizable pattern and give it a name or identity (Kleinman, 1980).

Kleinman (1980) asserts that healing activities in plural medical systems can be classified into three different sectors with different therapeutic options namely: the popular health care sector, involving lay representations of illness and cure since each culture prescribes a set of beliefs and practices for its members regarding health maintenance. The popular sector includes the self-medication of laypeople or the use of social networks to choose a treatment. The popular sector involves all the things a person does at home without seeking or consulting for help outside the home. The focus in this sector is in the beliefs of people and how these affect the kind of actions people take when sick. Decisions here may be individual, family or community based; the folk sector involve certain individuals who specialize in forms of healing that are either sacred or secular, or a combination of both without the aid of any formal training. However, the folk sector is heterogeneous in representation and can range from secular, technical experts such as bone setters, midwives, or herbalists, to spiritual healers such as the shaman; professional health care

sector which is an organized body with an emphasis on diagnosis and cure of the disease. In this sector, treatment is carried out by persons with specialized training and knowledge. The professional health care sector is best represented by the practice of biomedicine with its structured organization of physicians, specialists, nurses, and other health care workers and professionals. It includes not only primary care givers and specialists but also the entire body of health administrators.

The specific Explanatory Model is constituted in a semantic illness network. An informant's semantic illness network refers to a set of statements he or she actually makes over a given period of time, using EMs to respond to particular contingencies for example an episode of sickness or an anthropologist's questions. EMs are unlikely to be homogeneous even within the same community. Moreover, a person's EM is likely to alter over time, in response to his or her particular medical experiences and to the clinical encounters in which the person becomes acquainted with practitioners' explanatory model (Kleinman, 1988).

Explanatory models do not exist in isolation since socio-demographic factors such as gender, age, and source of income also greatly influence the explanatory models that people employ when ill. People's perceptions of how serious an illness is and how it will affect their life may depend on the explanation of the origin of their condition. It may also depend on whether they are able to afford to miss work or whether they can afford private health insurance (Kleinman, 1988). The socio-economic context will also influence the types of treatment that patients can afford for their illnesses and whether these take place mainly in the popular, folk or professional sectors. The gender, age group and stage of the life cycle of different individuals will also greatly influence the explanatory models that they employ. Those of children, the elderly, new mothers and family breadwinners are all likely to be very different from one another (Kleinman, 1978).

The relevance of the model to the present study is its direct applicability to drug utilization and in particular to determinants of first-line antibiotic use. In applying this model in the present study, the choice and utilization of antibiotics in health seeking behavior is explained by reconciling the tenets of the model with the three questions or objectives of the study.

The explanatory model provided an idea of how patients experienced and interpreted their conditions. This method allowed the researcher to draw illness experiences from the respondents in a structured way by examining knowledge on antibiotic use; beliefs and perceptions that influenced antibiotic seeking behavior; as well as the methods preferred by the respondents for educating them about appropriate antibiotic use.

The explanatory model of health and illness is concerned with etiology or cause of the infection (Kleinman, 1980). This was important because it helped into the inquiry on the respondents' socio-cultural beliefs and perceptions regarding the cause of their illnesses. This was therefore not intended to permit statements about actual causes *per se* but rather, to yield information on the respondents' normative statements or on what they thought was the cause of the symptoms. The emic perspective of the explanatory model proved particularly useful because it allowed the researcher to understand treatment patterns with antibiotics according to patients' explanatory models instead of only through the lens of biomedicine. It also had the merit to broaden the focus, previously limited to experts, onto the medical knowledge of laypeople. Reference to knowledge in the current study was specifically on knowledge on indication of purchased first-line antibiotics; source of advice for purchasing the antibiotics; purpose of purchasing the antibiotics and; knowledge on the effects of frequent and inappropriate use of the purchased antibiotics.

According to Kleinman (1980), interest in the medical knowledge of laypeople has been fostered by the cross-cultural observation that self-treatment is usually the first therapeutic choice in both urban and rural areas. Significantly, Kleinman estimated that in the United States and in Taiwan, common people choose self-treatment in about 80% of illness episodes.

The model is concerned with what patients considers as the strategies for treating their illnesses including, self-medication, consultation with friends or family or going to see a doctor (Kleinman, 1980). Hence this was useful in contextualizing the first objective of the study; as well as the second objective of the study on beliefs and perceptions that influenced the behavior of self-medication with the first-line antibiotics. Reference to beliefs and perceptions in the current study was specifically on perceptions; types of requests for the first-line antibiotics; types of acquisition for the antibiotics including with or without prescription; and perceptions about non-compliance to the first-line antibiotics.

Semantic illness networks are also described in a similar work on the explanatory models approach (Good, 1977). Here, the term semantic illness network is used to label the network of words, situations, symptoms and feelings which are associated with an illness and give it meaning for the sufferer. Accordingly, human illness is considered fundamentally semantic or meaningful and all clinical practice is inherently interpretive. The case studies on semantic illness networks come from a Turkic-speaking region of Iran (Good, 1977) and an out-patient clinic in the United States (Good, 1981). Over a period of months, Good collected information about symptoms, choice of therapies, social situation and the etiological circumstances his informants reported to him. Special attention was given to how social and situational changes affected the illness semantic configuration during this time. In this way, he reconstructed his informants' illness networks.

In conclusion, this chapter reviewed literature on the social and cultural factors regarding the use of antibiotics. It focused on key themes that captured the questions and objectives of the study. It included literature on consumers' knowledge on the use of antibiotics; beliefs and perceptions that influence consumers' behavior of antibiotics use and; the preferred methods of education on appropriate use of antibiotics. The chapter also presented Arthur Kleinman's Explanatory Model of health and illness which formed the theoretical framework that guided this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used in this study. It provides a description of the study design, study area, study population, sampling procedures and methods of data collection. It also explains the methods of data analysis and presentation and the ethical considerations.

3.1.2 Research Design

The study employed a descriptive research design. The design aided in achieving a snapshot picture of the socio-cultural factors in the utilization of antibiotics. Hence it was useful in capturing information within a short period of time. The design allowed the incorporation of elements of both quantitative and qualitative research methodologies within the same study. The study was conducted in two phases that is the pharmacy study and the household follow-up interview study that lasted five months. The first month involved community profiling. The second and third month involved conducting key informant interviews and focus group discussions. The fourth and fifth month involved administering semi-structured and unstructured questionnaires.

Because of the challenges of extracting the full import of a large mass of raw data, descriptive statistics was very important in reducing the data to manageable form. Where in-depth narrative descriptions were involved, the research used description as a tool to organize data into patterns that emerged during analysis.

3.1.3 Study Area

Factors that justified the selection of Manyatta 'A' sub-location as the study area include: a report on resistance to first-line antibiotics such as Tetracycline, Cotrimoxazole and Penicillin which was reported in Kondele and Manyatta markets in Kisumu, with the highest level of resistance detected against Cotrimoxazole (38.76 percent) (Sifuna *et al.*, 2008); the high prevalence of self medication with antibiotics in Kisumu (64.8%) (Kenya bureau of statistics, 2005) and; the presence of both registered and non-registered drug outlets in Manyatta area where antibiotics can be bought without a prescription (Kenya Ministry of Health, World Health Organization, & Health Action International, 2004).

Manyatta 'A' sub-location is one of the seven unplanned settlement in Kisumu located five kilometers from Kisumu city centre, off the Kisumu-Nairobi road in Kolwa West location of Winam Division in Kisumu East District (Pereira, 2011). The area consists of six villages, Kondele, Metameta, Flamingo, Konambuta, Magadi and Gonda. According to the last population census, Manyatta 'A' sub-location comprises 23,503 males and 24,501 females totaling 48,004 inhabitants in 12,525 households over an area of 24 km² with a density of 20,334 people/km² (Kenya National Bureau of Statistics, 2009).

Manyatta 'A' sub-location is characterized by poor liquid and plastic waste disposal. In the poorer neighborhoods, waste is frequently dumped by the roadsides and in some cases ends up blocking drainage (World Vision, 2008). Soil and rock structure in lower Manyatta 'A' sub-location restrict the construction of pit latrines and as a result developers put up toilets that fill up rapidly, spewing waste into the neighborhood. There are isolated instances of *flying toilets*¹ although most people resort to sharing toilets in the neighboring plots when their own compound has none. The risks of being contaminated with related diseases are greater in areas where it is more difficult to avoid contact with waste. Water sources include boreholes, shallow wells, unprotected water springs, piped water and water vendors. Households are rarely connected to the water network and can only rely on borehole and other sources of water which are most of the times unsafe for drinking because of contamination during collection and storage of water. There is also lack of proper ventilation and in the extreme cases due to the lack of resources; some housing units do not have any means of ventilation (Pereira, 2011).

Self-employment in the informal sector provides a source of income for a significant number of Manyatta residents where more than 70 percent of household heads are employed in informal sector. These jobs include selling groceries in small kiosks and hawking as well as handcart, motorcycle and bicycle taxi operators services. House renting is also a source of income for many dwellers providing permanent and reliable source of income. Other jobs include posho mills, tailoring, carpentry and welding. Service industries such as salons, barbers and shade restaurants also provide sources of income. Manyatta 'A' sub-location has four major markets: Manyatta, Kondele, Koyango and Kaego. The markets have no access to water, electricity, refuse collection or proper

¹*Flying toilets* - the use of plastic bags for defecation, which are thrown into ditches, on the roadside, or simply as far away as possible

toilets. There are no public dispensaries and the private hospitals in the area are beyond the reach of many. Most people walk long distances to the provincial or district hospitals or to the Lumumba health centre which is approximately 3 kilometers from Manyatta 'A' sub-location. Residents complain of poor services at the hospitals including long queues and cost sharing (UN HABITAT, 2005).

3.1.4 Study Population

The study population comprised of 28 pharmacies and pharmacy clients who had purchased any category of first-line antibiotics and were residents of any of the six villages in Manyatta 'A' sub-location. The study population also comprised of chief pharmacists and pharmacy clerks. The total population of all pharmacy clients buying first-line antibiotics from the pharmacies, chief pharmacists and pharmacy clerks could not be identified through official statistics. Therefore this necessitated the use of community profiling.

3.1.5 Sample Size and Sampling Procedure

3.1.5.1 Sampling Procedure for the Pharmacy Study

Manyatta 'A' sub-location has approximately 28 pharmacies arrived at during community profiling where the study mapped the location of all the pharmacies in the sub-location. This was because a physical list of all the registered and non-registered pharmacies in the sub-location could not be obtained. The sample size for the pharmacies was 8. This was drawn from the 28 pharmacies through Prakash (1994) 30 percent rule which states that if a population under study is homogenous, 30 percent of the population is sufficient for a survey. The pharmacies were homogenous to the extent that first-line antibiotics are sold in the pharmacies. The 8 pharmacies were then identified through simple random sampling. This was made possible because a physical list of all the pharmacies (n=28) in Manyatta 'A' sub-location had already been generated through community profiling. From the list, identification numbers were assigned to each of the pharmacies. Since there were a total of 28 pharmacies, and 28 is a two digit number, every individual pharmacy in the population was assigned a two digit number beginning 01 to 28. Then, an already computer generated random numbers table (appendix 6) was used to determine which of the 28 pharmacies was chosen in the sample. The first 8 numbers that were in the range from 01 to 28 on the list that corresponded to the subsequent numbers on the random

numbers table were selected without replacement to sample size 8. The number that was greater than the total number of pharmacies in the population was omitted.

The sample size for the pharmacy clients was 102 arrived at through a modified theoretical sampling strategy which was employed as a sampling strategy and not as a sampling method (Glaser & Holton, 2004). The appropriateness of this sampling strategy was to aid in both the determination and selection of the sample size and in the collection of both quantitative and qualitative data. Sampling and data collection were concurrent activities while data analysis occurred before and after all the 102 interviews were concluded. Respondents were therefore purposively selected from each of the 8 pharmacies to sample size (n=102) and not to data saturation. The sample size was considered appropriate according to Kathuri and Pals (1993) who indicate that a sample of at least 100 is sufficient for a survey. This is further corroborated by Prakash (1994) who asserts that if a population under study is homogenous, a small sample of 100 is sufficient. The 102 was therefore justified on this principle. The pharmacy clients were homogenous to the extent that they all purchased any category of the first-line antibiotics. This pragmatic method of implementing strategy resulted in a modified theoretical sample to enable the collection of both quantitative and qualitative data from pharmacy clients through semi-structured questionnaires. The quantitative data was generated from frequencies of responses from the unstructured section of the semi-structured questionnaires.

The inclusion criteria for the pharmacy clients was that they must have bought any category of the first-line antibiotics from pharmacies within any of the villages in Manyatta 'A' sub-location. They must have also been residents of Kondele, Metameta, Flamingo, Konambuta, Magadi and Gonda villages in Manyatta 'A' sub-location. The pharmacy attendants identified clients who purchased first-line antibiotics in the pharmacies and introduced them to the investigator. The investigator then determined the residency status of the pharmacy clients. Eight chief pharmacists were purposively selected for key informant interviews from the 8 pharmacies due to their capacity to provide in depth information about commonly purchased first-line antibiotics. Purposive sampling method was also used to identify 20 pharmacy clerks from the 8 pharmacies to be included in the focus group discussions.

3.1.5.2 Sampling Procedure for the Household Follow-up Interview

The qualitative household follow-up interview approach reinforced data generated from the pharmacy study that contained both quantitative and qualitative information by providing illustrations to help explain what lacked clarity. The sample size for the household follow-up interview was 31 determined according to Prakash (1994) 30 percent threshold. The sample size determination was made possible because a sampling frame of 102 pharmacy clients had already been defined. Hence, 30 percent of the 102 pharmacy clients resulted in 31 pharmacy clients who were followed to their respective households for qualitative interviews. Systematic sampling procedure was used to select the 31 pharmacy clients targeted for the follow-up interviews. In order to determine the sampling interval, the researcher divided the population size ($N=102$ pharmacy clients) by the sample size ($n=31$ pharmacy clients) resulting in 4. From the list of the 102 pharmacy clients interviewed at the community pharmacies, the researcher selected every 4th client in the list of 102 until achieving the required number ($n=31$) to be included in the household follow-up interview. In order to locate the 31 pharmacy clients in their respective households, a locator information guide in the structured questionnaires (appendix 3) for pharmacy clients containing relevant tracer information was used.

3.2 Methods and Instruments of Data Collection

This study used data triangulation in which different methods of data collection and analysis were employed. Quantitative data provided numeric descriptions of the socio-demographic characteristics, knowledge, beliefs, perceptions and behavior on antibiotics use. The quantitative data was generated from closed-ended questions on demographics and frequencies of responses from the unstructured questionnaires. Qualitative data provided in-depth explanations of the participants' knowledge about the use of first-line antibiotics and the beliefs, perceptions and behavior in the use of first line antibiotics. It also enabled in-depth explanations of the preferred methods of educating the members of the community about first-line antibiotics use. A drug chart (appendix 7) containing the commonly used first-line antibiotics was used to aid the respondents in identifying the drugs as first-line antibiotics kept in the respondents' homes.

3.2.1 Key Informant Interviews

Key informants refer to individuals who have the requisite information pertinent to the research problem and, elicited through responses on a one-on-one basis (Oso & Onen,

2008). Key informant interviews with 8 chief pharmacists were conducted using interview guides (Appendix 2). The views of the eight informants were considered crucial to this study since they dealt directly with clients who purchased first-line antibiotics from their respective pharmacies. From these interviews, qualitative data was obtained which provided a deeper understanding on the socio-cultural factors in the utilization of first-line antibiotics by residents of Manyatta 'A' sub-location.

3.2.2 Focus Group Discussions

The study utilized three focus group discussions for 20 pharmacy clerks identified with the help of chief pharmacists. Three focus group discussions were appropriate because they facilitated identification of issues not well covered in previous discussions which were pursued in details in subsequent FGD sessions. These included perceptions on self-medication and non-compliance on the antibiotic regimen. The participants were selected purposively from 8 pharmacies. The participants were sub divided into three groups of 6, 7 and another 7 participants. The researcher moderated all discussions during FGD sessions. The discussions were conducted in English. Proceedings of sessions were recorded using digital sound recorder and transcribed after each session. An FGD guide (Appendix 5) that contained the list of questions to be asked served as a reference tool to ensure that discussions were focused towards achieving the objectives of the study.

The aim of conducting FGDs was to get the perspective of pharmacy clerks on the central issues being studied. These issues included: commonly purchased first-line antibiotics by pharmacy clients; knowledge of pharmacy clients on the purchased antibiotics for instance indication, dosage and frequency; pharmacy clients' sources of advice for purchasing the antibiotics; reasons for purchasing the antibiotics and; knowledge on effects of frequent and inappropriate use. The pharmacy clerks were also considered for focus groups because of their ability to provide information on the pharmacy clients' perceptions about their preferences for dosage forms of the antibiotics such as capsules, tablets or liquid preparations; how the pharmacy clients requested for the antibiotics at the pharmacies; why pharmacy clients purchased antibiotics without prescriptions and; the methods appropriate for educating the respondents about antibiotics use.

3.2.3 Semi-structured Interviews

A semi-structured interview allowed new ideas to be brought up during the interview as a result of what the interviewee said. In this method, a semi-structured questionnaires (Appendix 3) with both closed and open ended questions were administered to 102 pharmacy clients. The semi-structured questionnaire was divided into two sections. The first section on demographics which was structured and the second section on knowledge, beliefs, perceptions and behavior, and preferred methods of education which was primarily unstructured. The choice of answers in the demographic questions were fixed in advance. The aim of these interviews was to capture quantitative data on the respondents', knowledge, beliefs, perceptions and behavior on the use of first-line antibiotics. In addition to the the methods preferred by the respondents for educating them about use of first-line antibiotics. The semi-structured approach enabled the collection of both qualitative and quantitative data.

3.2.4 Unstructured Interviews for household follow-ups

In the household follow-up interview, unstructured interviews (Appendix 4) were administered to a total of 31 informants. These were either actual drug users or drug messengers who had earlier been interviewed at the pharmacies and who were followed to their respective households for qualitative interviews. The unstructured interviews were made up of primarily open-ended questions to elicit free responses. This augmented the quantitative data from the pharmacy clients by providing qualitative data on the participants' knowledge, beliefs, perceptions and behavior regarding antibiotics use. In addition to the preferred methods of antibiotics use education.

3.2.5 Pre-Testing

Presser, Couper, Lessler, Martin, Martin, Rothgeb and Singer (2004) prescribes that a sample size for a field test should be based on ten percent of the sample size for a study. Hence, the sample size for the pilot test for the present study was determined on this basis. Thus 10% of 102 pharmacy clients meant that 10 semi-structured questionnaires for 10 pharmacy clients not included in the sample were conveniently selected then pre-tested. The pretest was conducted in purposively selected pharmacies in Manyatta 'A' sub-location also not included in the sample but from the same study area. The sample size for the pretest of unstructured questionnaires was 10% of 31 informants for the follow-up interview. Therefore 3 unstructured questionnaires were pretested among three

informants that were not part of the sample size (n=31). The key aim of pre-testing was to provide a basis for the construction of reliable instruments so that important feedback obtained from the pre-testing was used to make the final form of the instruments. This improved the instruments workability through correct wording and appropriate ordering. In addition, the prepared instruments were discussed with the supervisors to ensure that they were adequate enough to collect data that would eventually address the objectives of the study. The pre-test procedure was aimed at detecting problems with the design and formatting of questions to minimize low response rates caused by misunderstandings and ambiguity, hence, improving reliability and validity.

3.2.6 Reliability

Reliability was ensured through test-retest method. This method involved comparing the results of a test at one time with results using the same subjects at a later time. Semi-structured questionnaires for 8 pharmacy clients conveniently selected were prepared and then pre-tested in 8 purposively not previously selected pharmacies in Manyatta 'A' sub-location. The pharmacy clients were then followed to their respective households for a follow-up interview twice in two weeks and the responses then collected and collated. The key aim of reliability was to ensure that the measuring strategy had the capacity to produce consistent results.

3.2.7 Validity

The study employed triangulation as a validity procedure. Here, the researcher searched for convergence among multiple and different sources of information to form themes or categories in the study (Creswell, 1998). By using several kinds of methods or data, including quantitative and qualitative approaches, triangulation strengthened the study by combining methods (Patton, 2001). The qualitative nature of the follow-up interview also provided in depth illustrations of the numeric descriptions initially generated in the pharmacy interview. The key aim of validity was to ensure that the research questions in the instruments were actually measuring the characteristics that constitute socio-cultural factors in the use of first-line antibiotics.

3.3 Data Analysis and Presentation

Descriptive statistics were used in analyzing the quantitative data which was presented in frequency tables. Microsoft Excel computer package for windows 2003 was applicable

for use with descriptive statistics because it enhanced the summarization of theme frequencies generated from responses in the unstructured questionnaires. Qualitative data from unstructured questionnaires, key informant interviews and focus group discussions were analyzed thematically.

Part of thematic analyses involved transcribing data from key informants' interview guides and focus group discussion guides into written forms. It also involved reading and re-reading the qualitative data from unstructured questionnaires, key informants' interview guides and focus group discussion guides to become more familiar with the data. Specific attention was paid to patterns that occurred.

Initial codes were generated by documenting where and how the patterns occurred. This happened through data reduction where the researcher collapsed the data into labels in order to create categories for more efficient analysis. Coding the text involved categorizing particular text segments by assigning a code to any segment of the text in the unstructured questionnaires, key informants' interview guides and focus group discussion guides. The researcher also made inferences about what the codes meant as well as combining codes into overarching themes that accurately depicted the data. Theme frequencies were then compared as well as identifying theme co-occurrence. This was followed by defining what each theme was, which aspects of data were being captured and what was interesting about the themes.

The emergent themes were discussed on the basis and tenets of Arthur Kleinman's (1980) explanatory model of health and illness. As a methodological device, the EM method allowed the researcher to draw illness experiences from the pharmacy clients from their point of view in a structured way using both quantitative and qualitative methods. Thematic analysis helped in capturing the respondents' knowledge, beliefs, perceptions and behavior regarding the use of first-line antibiotics and the preferred methods of educating the respondents about antibiotics use. Qualitative data were presented in textual descriptions and illustrations using verbatim quotations

3.4 Ethical consideration

Permission to proceed with the study and guarantee respect for human subjects was obtained from Maseno University Ethics Review Committee. Informed consent was

obtained from all participants after explaining the nature of the study. Respect for the privacy and dignity of the respondents/participants was maintained throughout the data collection and analysis process. This involved informing the respondents/participants that their participation in the study was completely voluntary and they were assured of confidentiality. Given the study area and the population, the semi-structured questionnaires for the pharmacy clients and unstructured questionnaires for household informants were translated and backtranslated from English to Dholuo to ensure full comprehension by the respondents/informants. No identifying name tags were used in the data collection instruments. Study records that contained information about the participants were handled as confidentially as possible. All research records were coded so that no person outside the study could identify the participants personally. Participants' names were not used in the report about the study. The principle investigator kept all the information learnt in this study. All data were stored on a secure computer, accessed only by the principle investigator.

In conclusion, this chapter presented the methodology that was used in this study. It provided a description of the study design, study area, study population, sampling procedures, and methods of data collection. This study used data triangulation in which different methods of data collection and analysis were employed for enhanced validity. It also explained the methods of data analysis and presentation and the ethical considerations.

CHAPTER FOUR

KNOWLEDGE ABOUT THE USE OF FIRST-LINE ANTIBIOTICS AMONG PHARMACY CLIENTS IN MANYATTA 'A' SUB-LOCATION

4.1 Introduction

The chapter presents and discusses results of the study on the pharmacy clients' knowledge about the use of first-line antibiotics. The chapter also describes the demographic characteristics of respondents in terms of gender and age.

4.2 Socio-Demographic Characteristics of the Respondents

4.2.1 Gender of respondents

Results of the gender of pharmacy clients are summarized in table 4.1.

Table 4.1: Gender of pharmacy clients

Gender distribution of pharmacy respondents	Frequency	Percent
Male	25	24
Female	77	76
Total	102	100

The findings indicate that more than three quarters of the pharmacy clients (n=102) were females while less than half of the respondents in the study were males. The variation in gender participation was due to the high number of female pharmacy clients who purchased the antibiotics at the pharmacies and were available for the interviews. The dominance of women in this study and subsequently in healthcare provision is attributed to their availability at that particular point in time during the interviews. Thus, the women in the study are involved in the utilization of antibiotics at the point of selection and acquisition as drug messengers or at the point of actual use as actual drug consumers. In this context, the female respondents either purchased the antibiotics for themselves or for their children or an adult member in their respective households. This aspect points to the significance of health education about antibiotic use in the community targeting women clients.

4.2.2: Age of pharmacy clients

Most (72.3%) of the pharmacy clients were estimated to be in the age group of 18 to 30 years while respondents within the age group of 31-40 years constituted 13.9%.

Respondents within the age group of 41-50 years constituted 8.9% and 4.0% for those interviewees who were above 50 years of age. The results are presented in table 4.2.

Table 4.2: Age of pharmacy clients

Age distribution of pharmacy respondents	Frequency	Percent
18-30	74	73.0
31-40	14	13.5
41-50	9	8.5
Above 51	5	5.0
Total	102	100

The results suggest that this age group (18 to 30 years) participates in perceived or real health enhancing behavior regarding the use of the acquired antibiotics. In this predominant age group, there seemed to be high usage of antibiotics suggesting their involvement in formal and informal health care with first-line antibiotics. However, the study did not explore this through correlation and could not therefore establish the significant contribution of this predominant age group in the use and misuse of antibiotics. It should also be noted that pharmacy clients visit the pharmacies either to purchase the antibiotics for themselves or for others.

A study in Malaysia showed that respondents who were 18 to 30 years old were the most frequent groups significantly associated with negative attitudes towards antibiotic usage (Oh *et al.*, 2011). Age was also associated with knowledge regarding antibiotic use among adults in the community of Jordan. Younger respondents (18–25 years old) were more likely to utilize antibiotic(s) in the past year (Shehadeh *et al.*, 2012). This contrasts other studies in Hong Kong (Lee, Tsang, Lee & To, 2001) and Italy (Denglar & Robert, 1996) which showed the role of age in antibiotics use but among children.

4.3 Knowledge about the use of first-line antibiotics among pharmacy clients

The first task of this study was to explore the pharmacy clients' knowledge related to the use of antibiotics. Knowledge was determined under the following sub-headings: commonly purchased antibiotics by pharmacy clients; knowledge on the purchased antibiotics by the pharmacy clients; source of advice for the purchase of the antibiotics;

purpose of purchasing the antibiotics and; knowledge on effects of inappropriate use of the purchased antibiotics by pharmacy clients

4.3.1 Commonly purchased antibiotics by pharmacy clients

Table 4.3: First-line antibiotics purchased by pharmacy clients

First-line antibiotics acquired	Frequency	Percent
Erythromycin	7	6
Tetracycline	5	5
Septin	18	18
Amoxicillin	38	38
Flagyl	17	17
Ampiclox	11	10
Ampicillin	3	3
Doxycycline	2	2
Norfloxacine	1	1
Total	102	100

These results show that amoxil, septrin, flagyl and ampiclox were mostly purchased by the pharmacy clients in the study. Other antibiotics that were purchased include erythromycin tetracycline, ampicillin, doxycycline and norfloxacine. The reasons for these frequencies in purchase of the antibiotics are illustrated by verbatim quotes from key informants' interviews and pharmacy clerks in focus group discussions:

Some (pharmacy) clients come and say Amoxil, septrin.... Mostly they use it for coughs, sore throat and flagyl for stomach ache (Key informant, 36 years old)

They have had the same problem and used the drugs before! Somebody (pharmacy client) just come and say give me Amoxil and you still don't know what he or she is suffering from (Female pharmacy clerk, 25 years old)

A client will come with ten shillings for Amoxil and if you try to advice you may loose the customer because they may view you as invading their privacy (male pharmacy clerk, 30 years old)

Consequently, Kleinman's model (1988) is concerned with what patients consider as the strategies for treating their illness including self-medication or consultation with health care providers. Accordingly, the verbatim quotes from key informants and pharmacy clerks helps to elucidate the pharmacy clients' semantic illness networks and how they respond to episodes of sickness. The pharmacy clients' perceived knowledge on the treatment indication of the antibiotics and patient demands have an influence in the

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prescribing and dispensing practices of the pharmacy personnel. The illustrations also highlight aspects of misuse of the antibiotics such as purchase without prescriptions, reliance on previous experience with the antibiotics to diagnose current illnesses and not purchasing the antibiotics in full doses.

Other studies have also indicated that the most frequently used agents were amoxicillin, cotrimoxazole, erythromycin, ampicillin/cloxacillin and tetracycline (Marliere *et al.*, 2000; Calva and Bojalil, 1996; Van doung *et al.*, 1997). The antibiotics are easily accessible as over-the-counter drugs (Kenya Ministry of Health, World Health Organization & Health Action International, 2004). Poor control of drug distribution means that many restricted pharmaceuticals are easily available over the counter. Ready access to prescription antibiotics promotes a popular health culture wherein people engage in self-diagnosis by noting treatment outcomes; retain and reuse old medications for what they see as recurring illnesses. Misuse of antibiotics by patients is facilitated through a drug distribution system that encourages over the counter sale of antibiotics (Kamat & Nichter, 1998).

Qualitative data from the present study reveal that the respondents attach a belief that the acquired antibiotics could be used to relieve several illnesses including coughs, flu/cold, stomach ache, rashes and *yamo*². One informant for instance stated that:

Septrin prevents someone from becoming sick, minor illnesses like flu, rashes that appear on the body and it also treats *yamo* (Female informant, 39 years old).

Another female household informant noted that:

I know that Amoxil is good for somebody who is coughing, has rashes or stomach problems (Female informant, 30 years old).

The qualitative results from a key informant interview also revealed that *yamo* is a perceived cause of the illnesses (respiratory tract infections and gastrointestinal tract infections) that pharmacy clients report at the pharmacies when they seek the antibiotics.

Accordingly, one key informant noted that:

They (pharmacy clients) say '*yamo*'.....change of weather caused chest problems for example coughs, or that they took contaminated meals such as meat (Chief pharmacist, 36 years old)

²*Yamo* is an indigenous disease category referring to a constellation of ailments including boils, rashes, coughs, measles, diarrhea, fever and flu associated with self-medication with antibiotics. *Yamo* is perceived as an illness causing agent as well as a classification of illnesses.

The narrative implies that *yamo* is caused by weather changes and since *yamo* is a classification of illnesses, the respondents are in essence acknowledging that the illnesses characterized as *yamo* are albeit sub-consciously, also caused by weather changes. *Yamo* is perceived as an illness causing agent and a classification of illnesses and the antibiotics are used to prevent *yamo* as well as to treat it. The narratives also emphasize the participant's belief in the efficacy of septrin for prophylactic use and to treat flu and body rashes. The narratives reiterates the participant's belief in the efficacy of amoxil to treat several illnesses as well. The perceived knowledge on the efficacy of the antibiotics presents opportunities for misuse of the antibiotics such as purchasing without prescription and over-use. Most upper respiratory tract infections such as the common cold, flu and sore throats are generally caused by viruses and antibiotics do not work against viruses (Nordqvist, 2009) hence compromising their therapeutic outcomes.

According to Kleinman (1980), understanding the folk taxonomies of diseases is an important approach in understanding people's therapeutic approaches. Kleinman further argues that a structural analysis of the cultural understandings and classification of diseases, that is folk taxonomy of diseases, can enable the understanding of people's motivations in practicing alternative medicine. The application of values to types of illness has an important influence upon the decisions people make in responding to particular episodes of sickness. People have their own perceptions about the etiology or cause of the infection based on their behavior, diet, body build, and personality or hereditary. Respondents' cultural understandings on diseases can be crucial in influencing their choices of remedy with the antibiotics.

4.3.2 Knowledge about the antibiotics purchased

Results from the pharmacy study showed that more than half (52%) of the pharmacy clients have perceived knowledge on the illness which the purchased antibiotics is indicated for. Approximately 32% of pharmacy clients knew the name of the first-line antibiotics purchased, while an estimated 16% did not know anything about antibiotics purchased as presented in table 4.4.

Table 4.4: Pharmacy client’s knowledge about the first-line antibiotics purchased

Knowledge on first-line antibiotic	Frequency	Percent
Indication (i.e. correspondence of the symptom and the drug)	54	52
Name of drug	32	32
Don’t know	16	16
Total	102	100

Follow-up interview provides illustrations of informants’ knowledge on the indication of the antibiotics purchased. Thus, informants noted:

I have known from the past, from my parents when they used to send me to the shop, that flagyl treats stomach ache (Female informant, 20 years old)

I knew from my mother, she used to say that Amoxil is good, when the child has a flu or is coughing, it will help (female informant, 30 years)

Knowledge that flagyl and amoxil is indicated for stomach ache and flu or coughing respectively has been imparted to the informants as a result of the processes of socialization. Stoelben *et al.* (2000) however contrasts the assertion that drug consumers acquire knowledge on antibiotics through socialization. Stoelben points out that adolescents gain drug knowledge through drug consumption and not before taking drugs. This leads to a potential risk of misuse of the drugs since, illnesses may appear similar but the drugs used to treat the illnesses may not be the same. Health beliefs and practices are integrated into one’s cultural orientation. Some belief systems may encourage the overuse of antibiotics, particularly the use of non-prescribed antibiotics (Mainous *et al.*, 2008).

The perceived knowledge of what illnesses requires the antibiotics therapy is as a result of past experience with the drug as indicated by the narrative below:

I have used it (amoxil) before, sometimes back and it helped me that is why I bought it (Female informant, 23 years old)

A participant in one of the FGD sessions also provided insights into pharmacy clients antibiotics use knowledge. He noted that:

They only know what to use it for, for example tetracycline they relate with diarrhea and sexually transmitted infections.....they tell you amoxil, am coughing, I have wounds... when they come to the pharmacies and its upon you to advice (Male pharmacy clerk, 31 years old)

The narrative above suggests that pharmacy clients did not have knowledge about proper diagnosis and treatment with the antibiotics and that is why a pharmacy clerk advised them on proper use. The advice of pharmacy clerk alluded to in the narrative further indicates the place of drug dispensers in the process of acquisition of antibiotics. Given that the study did not confirm the qualifications of the pharmacy clerks, it is not possible to ascertain if indeed the advice on proper diagnosis and subsequent prescription was evidence based. The perspectives of dispensers therefore predispose the community members to proper or improper use of the antibiotics. Thus, according to Kleinman (1988), explanatory models are unlikely to be homogenous even within the same community. A person's explanatory model is likely to alter over time in response to particular medical experiences and to the clinical encounters in which the person becomes acquainted with practitioners' explanatory model.

The narrative also acknowledges that pharmacy clients have a perceived knowledge on the indication of the antibiotics purchased. Some pharmacy clients can influence the dispensing behavior of pharmacy personnel because when they come to the pharmacies, they already know what drug they want and the perceived illness that the drugs alleviate. A study done in Philippines by Calva (1996) revealed that antibiotics were used commonly by commercial sex workers prophylactically against STDs and HIV and were seven times less likely to use condoms with greater than 80% of their customers. Use of antibiotics prophylactically by commercial sex workers offers them a false sense of security in high-risk environment. Other surveys have also shown that consumers have misconceptions about the types of illnesses that can be effectively treated with antibiotics (Burak & Damico, 1999; Burak & Damico, 2000; Dowler, Thomas, & Saddler, 2003; Vandenberg *et al.*, 2003).

Pharmacy clients' lack of knowledge on the antibiotics purchased is indicated by the respondents who did not know anything about the first-line antibiotics purchased. Thus, an informant reported that:

I know that its (Septrin) just a drug and it helps, I have not studied drugs and i see that they relieve coughing when I use them (Female informant, 28 years old).

The informants who did not know anything about the first-line antibiotics purchased acknowledge their reliance on pharmacy attendants who provided the diagnosis and prescription based on the respondents' description of their symptoms. The respondents

described the subjective state of how they felt and in the absence of a medical test, their perceptions of their illnesses influences prescribing patterns of the pharmacy attendants. The situation is aggravated when drug consumers know the names of those first-line antibiotics without adequate understanding of indications and their use and when the drugs are sold without restriction. Also, knowing the name of the drug and dose does not qualify for adequate knowledge of drugs (Tadege, 2002).

Extrapolating from these analysis, pharmacy clients play an important role in the interactions that lead to prescription. Pharmacy clients formulate and articulate their values to achieve health needs that is, treatment with first-line antibiotics. The pharmacy attendants power in relation to prescription and dispensing of the antibiotics is exerted in response to the situational context to meet the needs of the pharmacy clients. This power relation in client physician interaction could serve to reinforce health enhancing or health lowering behaviours relating to antibiotic use.

4.3.3 Source of advice for acquisition of first-line antibiotics

Pharmacy clients were asked about their sources of advice for the acquisition of the first-line antibiotics. Most of the pharmacy clients (30%) were advised by pharmacists or those working in the pharmacy and health care providers but without prescription (28%). Other (25%) respondents were advised by neighbors, friends and relatives. Ten percent of the pharmacy clients received advice from health care providers but with prescription (10%) while 7% had no source of advice (respondent knew about it). The results are as presented in table 4.5.

Table 4.5: Advice for purchase of antibiotics

Sources of advice	Frequency	Percent
Received no advice (respondent knows about it)	7	7.0
Advised by neighbors, friends or relatives	25	25.0
Advised by Doctors Nurses, Health workers but without prescription	29	28.0
Advised by Doctors Nurses, Health workers but with prescription	10	10.0
Recommended by pharmacists or those working in the pharmacy	31	30.0
Total	102	100

These results are further reinforced by FGD findings which also showed that pharmacy clients' sources of advice for acquisition of the antibiotics were reference groups. A pharmacy clerk noted that:

Mostly they get advice from relatives and neighbors or they say they have used it before to treat the same symptoms because most come without prescription.....they say it has treated somebody before or it had been prescribed to them before so they come and request for it (Male participant, 32 years old).

Deducing from the above illustration, respondents rely on informal sources for consultation on antibiotic use. Without the avenue for consulting a doctor, the respondents may resort to informal sources of information such as friends, relatives or neighbors for acquisition of the antibiotics and also from previous illness experiences. The over the counter drug decision and purchase behavior particularly health seeking behavior is influenced by these informal sources.

During an illness episode, individuals commonly seek information and advice from a referral networks. This affects self-diagnosis and treatment by providing reference points for perceptions of illnesses by contributing knowledge gained through experience and by sharing of medications (Nancy & Markm, 1997; Lau *et al.*, 1995). Hardon and Van der Geest (1987) has also showed the role of reference groups as sources of advice for antibiotics use. Drug store customers in the Philippines, India, Mexico and Brazil relied on advice that was given by friends or relatives to buy antibiotics (Calva, 1996; Dua *et al.*, 1994; Lansang *et al.*, 1990; Schorling *et al.*, 1991). Survey data of adults in the United States showed that in almost every case where a respondent reported asking a healthcare provider for a prescription for an antibiotic, the provider gave it (Boyd *et al.*, 2008). Social networks shape the respondents' knowledge and perceptions about the antibiotics which in turn influence the behavior concerning the selection, acquisition and use of the antibiotics. The high reliance on health care personnel for acquisition of the first-line antibiotics gives health workers a window of opportunity to promote rational antibiotic use.

4.3.4 Purpose of purchasing the antibiotics

Table 4.6: Purpose of purchasing the antibiotics by pharmacy clients

	Amoxil (%)	Septrin (%)	Flagyl (%)	Erythromycin (%)	Tetracycline (%)	Ampicillin (%)	Ampiclox (%)
Coughs	12	8		4			
Stomach Ache			9		5		
Cold/Flu	8	10					
Diarrhea			8		1		
Headache/Fever	4	3					
Boils	1					1	4
Rashes	1	2				1	
Cuts/Wounds						1	7
Sore throat		3					
Pain		2	1				
Fatigue/Malaise	1	3					

These results (table 4.6) indicate that amoxil and septrin were mostly used for the treatment of coughs, but also for cold/flu, head ache, boils, rashes and fatigue/malaise. Flagyl on the other hand was used for the treatment of stomach ache, diarrhea and pain; while erythromycin for the treatment of coughs; tetracycline for stomach ache and diarrhea; ampicillin for boils, rashes and cuts/wounds and finally ampiclox for boils and cuts/wounds. The antibiotics were mostly indicated for the treatment of illnesses such as coughs, cold/flu, stomach ache and diarrhea. This is in agreement with studies done in Mexico which showed that the main reasons for medication with antibiotics were respiratory tract ailments and gastrointestinal infections for minor symptoms such as cough, sore throat, stomach upsets and diarrhea (Doung, Binns, & Van, 1997) and colds (McKee *et al.*, 1999).

A study by Enato and Uwaga (2011) evaluated self-medication practices and prescribing patterns of general antibiotics in Port Harcourt, Nigeria and results revealed that one of the most frequent medical conditions in which general antibiotics were used were upper respiratory tract infections. A study by Olayemi, Olayinka and Musa (2010) in Nigeria also documented gastrointestinal tract infections as the predominant condition for self-medication with antibiotics. Diarrhea is a common illness in developing countries because of poor sanitary conditions and limited water accessibility (Calva & Bojalil, 1996).

Overuse of antibiotics for many infections, for example, upper respiratory tract infections (URTI), has been reported although the majority of these infections are caused by viruses against which antibiotics have little or no clinical benefit (Gonzales *et al.*, 1997). Additional studies have also revealed that depending on where they live and the type of practitioner they visit, 45 to 80 per cent of patients with symptoms of respiratory infections and diarrhea are likely to receive an antibiotic. This is despite the fact that it will not be effective if they have a viral illness rather than a bacterial one (Kotwani, Chaudhury & Holloway, 2010; Kumar, Indira, Rizvi, Rizvi & Jeyaseelan, 2008).

The disclosure of the participants' illnesses that prompted the acquisition of the antibiotics is based on self-report. It was therefore not possible to establish whether the antibiotics treat the reported illnesses by the pharmacy clients. Further, it is important to note that people reported understanding about symptoms of their illness may deviate from biomedical concepts since they experience symptoms and label them based on their cognitive framework (Kleinman, 1980). The misuse of antibiotics by the respondents in the study was inferred from the pharmacy clients' perceived knowledge, beliefs and behavior regarding the use of the antibiotics. These perceptions were related to purchasing the antibiotics without prescriptions, taking the antibiotics for colds and other illnesses and non-adherence.

4.3.5: Knowledge on inappropriate use of antibiotics

More than half (55%) of the respondents interviewed believed that inappropriate use of the antibiotics had health effects while 25% did not. Other respondents (20%) did not know whether inappropriate use of antibiotics had effects or not (Table 4.7a). Less than half (41.4%) of the respondents reported side effects as the effects. Drug resistance

(29.3%), increase in illness (17.2%) and death (8.6%) were also some of the mentioned effects of inappropriate antibiotic use. Results are presented in table 4.7b.

Table 4.7(a): Effect of inappropriate antibiotic use

Do you think frequent and inappropriate antibiotic use has any danger?	Frequency	Percent
Yes	54	55
No	26	25
Don't know	22	20
Total	102	100

Table 4.7(b): Knowledge on health effects of inappropriate antibiotic use

Health effects of inappropriate use	Frequency	Percent
Drug resistance	17	29.3
Side effects	24	41.4
Illness increases	10	17.2
Death	6	8.6
Don't know	2	3.4
Total	58	100.0

The findings indicate an improved awareness of the respondents on the effects of inappropriate use. This contradicts another study in the United States in which 58% of consumers were not aware of the health dangers associated with antibiotic use (Vandenberg *et al.*, 2003). The fact that the respondents are aware of the health effects of inappropriate use of the antibiotics does not necessarily translate to proper use. This is supported by the findings of the present study which indicated that more than half of the pharmacy clients acquired the antibiotics without prescription. The findings of the follow-up interview also showed that respondents discontinued taking the antibiotics as soon as the symptoms disappeared.

These behaviors regarding antibiotics use contradicts the knowledge status of the pharmacy clients which indicate greater awareness of health effects of antibiotics use. However, the findings above are not consistent with the key informant and FGDs findings which revealed that drug consumers did not know if there were effects of inappropriate first-line antibiotic use.

One chief pharmacist for instance stated that:

They don't know the effects and they don't want to know, they just want to be cured for example a client will come with ten shillings for amoxil, if you try to advice, you may lose the customer because he or she may view you as invading their privacy (Chief pharmacist, 41 years old)

An FGD participant noted that:

They don't know and that's why we advise them and they tend not to cooperate because they have a fixed mind after they have discussed it out there with other groups. They just come for the drugs they have been told by friends, they don't know what they are suffering from. Most of them don't even complete their doses because you find that somebody buys half dose, a customer will come and tell you, give me two amoxil (Pharmacy clerk, 26 years old)

The above statements by pharmacy personnel bring to the fore antibiotics use practices by drug consumers in the community. From the perspective of the pharmacy personnel, pharmacy clients do not know whether inappropriate use of antibiotics have health effects. The pharmacy personnel assessed the respondents' knowledge on inappropriate antibiotic use not from structured questions but from pharmacy clients' normative statements and observations of the client's antibiotics use behavior. For instance buying half doses and not completing doses, and reliance on reference groups for informal prescriptions. This supports the pharmacy study results which indicated that 25% of the respondents received advice from reference groups. The respondents perceive themselves or other patients as susceptible to negative health outcomes if they do not behave in a certain way, that is, if the antibiotics are not used "correctly".

In conclusion, this chapter has presented and discussed results on the knowledge about use of first-line antibiotics among pharmacy clients. Results show that more than three quarters (76%) of the pharmacy clients interviewed were females. The dominance of women in the study and subsequently in healthcare provision is attributed to their availability at that particular point in time during the interviews. This is because the women either purchased the antibiotics for themselves or for their children, or an adult member in their respective households. Results on age show that most of the respondents were between ages 18 to 30 years. This factor points to the contribution of this age group in perceived or real health enhancing behaviors that relates to the use of antibiotics.

Commonly purchased antibiotics by the respondents were amoxil, septrin, flagyl and ampiclox to treat illnesses like coughs, cold/flu, head ache, boils, rashes and

fatigue/malaise, stomach ache, diarrhea and *yamo*. *Yamo* is an indigenous disease category referring to a constellation of ailments including boils, rashes, coughs, measles, diarrhea, fever and flu associated with self-medication with antibiotics. *Yamo* is perceived as an illness causing agent as well as a classification of illnesses. These observations imply that respondents' cultural understandings on diseases can be crucial in influencing their choices of remedy with the antibiotics. More than half of the pharmacy clients had a perceived knowledge on the illness which the purchased antibiotics was supposed to treat. This perceived knowledge was imparted to the pharmacy clients as a result of the processes of socialization as well as past experience with the drug. The knowledge is also imparted through advice by pharmacy attendants, further indicating the place of drug dispensers in the process of acquisition and cultural constructions of the antibiotics by pharmacy clients.

Respondents relied on informal sources for consultation to purchase the antibiotics. The health seeking behavior particularly the over the counter drug decision and purchase is influenced by informal sources such as family, neighbours, friends, and healthcare workers but without formal prescriptions. The findings show that most of the respondents believed that there were effects of inappropriate use of antibiotics. The mentioned effects include drug resistance, side effects, increase in illness and death. The respondents perceive themselves or other patients as susceptible to negative health outcomes if they do not behave in a certain way, that is, if the antibiotics are not used "correctly". The fact that the respondents are aware of the health effects of inappropriate use of the antibiotics does not necessarily translate to proper use.

CHAPTER FIVE

PHARMACY CLIENTS' BELIEFS AND PERCEPTIONS THAT INFLUENCE THE BEHAVIOR ON USE OF FIRST-LINE ANTIBIOTICS IN MANYATTA 'A' SUB-LOCATION

5.1 Introduction

The chapter presents and discusses data on the beliefs and perceptions that influence the behavior on use of first-line antibiotics. Specifically, the chapter addresses this theme according to the following sub-headings: perceptions and beliefs concerning dosage forms; types of requests; types of acquisition and the perceptions behind the acquisitions and; adherence to advice on use of the antibiotics.

5.2 Beliefs, perceptions and behavior influencing the use of first-line antibiotics

The second objective of the study analyzed the beliefs and perceptions that influenced the behavior on use of first-line antibiotics. Drug use, as part of the process of medical care requires the people who give and take drugs to make various types of decisions. At all points, they are affected by their varied cultural perceptions, by their social networks and by psycho-social factors. Although national campaigns have been carried out with the aim of modifying public misconceptions regarding the effectiveness of antibiotics for all types of illnesses, and thus prevent the development of antibiotic resistance (Andre, Vernby, Berg, & Lundborg, 2010; Curry, Sung, Arroll, Goodyear-Smith, Kerse, & Norris, 2006; McNulty *et al.*, 2007; Woodhead & Finch, 2007), the general public had been reported to have beliefs and perceptions that bring misunderstandings and a lack of knowledge about antibiotics (Asekun-Olarinmoye *et al.*, 2014).

5.2.1 Beliefs and perceptions about dosage forms

All the respondents preferred one or the other dosage form such as tablet, capsule or liquid preparation. It emerged that most (41%) of the pharmacy clients had preference to the antibiotics in the form of capsules followed by liquid preparations (40%) and tablets (19%) as presented in table 5.1.

Table 5.1: Dosage form preferences by the pharmacy clients

Dosage form	Frequency	Percent
Tablet	20	19
Capsule	42	41
Liquid preparations	40	40
Total	102	100

Themes that emerged from the qualitative follow-up interviews concerning preference for the antibiotics in various dosage forms include: difficulty of swallowing tablets/capsules, belief that tablets/capsules are for adults, belief that liquid preparations are for children, ease of preparation, perceived efficacy of tablets/liquid preparations/capsules, and ease of swallowing tablets/ liquid preparations. Thus, informants from the household follow-up interview stated:

It's (syrup) good for children because they cannot use capsules (Female informant, 26 years old)

Amoxil syrup is given to a child for seven days then you have to discard after and may be the cough has not been relieved (Female informant, 19 years old)

The child is still young to use capsules, unless it is recommended by the doctor (Female informant, 26 years old)

The belief that the antibiotics in capsules and tablets dosage forms are for adults coincides with instances where the respondents actually used the antibiotics on themselves or an adult member of the household. Likewise, the belief that liquid preparations are for small children also coincides with antibiotics use in children at that particular point in time. This belief has been reinforced into the individuals through history of use and prescribing patterns of the community pharmacies, private clinics and public health facilities. The perception that antibiotics use in certain age groups exist specifically in certain dosage forms may distort the idea of use by household members. This may in turn influence the choice and use of the drugs. Patient demand influences prescribing behavior (Schwartz, Soumerai, & Avorn, 1998). When the child is suffering from RTIs or GTIs the pharmacy clients are given relevant antibiotics in suspension form and when they themselves or adult members of the households are sick, they are given the antibiotics in capsules or tablets. It can therefore be argued that respondents' preferences on the requested antibiotics may have also been influenced by the repeated exposure to these dosage forms given their varied sick roles.

5.2.2 Types of requests for the first-line antibiotics

The pharmacy study revealed that half (52%) of the pharmacy clients requested for the antibiotics they wanted by telling the symptoms of their illnesses. This suggests that pharmacy clients are also in essence requesting for the advice of the dispenser and also testing the expertise of the person on the other side of the counter of their ability to diagnose minor illnesses and select appropriate drugs. A further 24% of the respondents in this study stated that they requested for the antibiotics by mentioning the name of the drug. In Australia however, trade names were by far the most common means of identification (Yelland & Vietch, 1989). Still, others requested for the antibiotics from the pharmacies by presenting a piece of paper on which the name of the drug was written (23%). The remaining 1.0% requested for the antibiotics they wanted by mentioning the group to which the drug belongs. The results are as presented in the table 5.2

Table 5.2: Types of requests for the first-line antibiotics

Types of requests	Frequency	Percent
By mentioning the name of the drug	25	24
By mentioning the group to which the drug belongs, e.g. antibiotics	1	1.0
By telling the symptom of your illness	52	52
By presenting a piece of paper on which the name of the drug was written	24	23
Total	102	100

Verbatim quotes from key informant interviews with chief pharmacists and focus group discussions with pharmacy clerks further illustrates these findings:

Some (pharmacy clients) come (to the pharmacies) when they are coughing and say I need Amoxil, some say they have diarrhea and I give them flagyl and explain to them how to use it (Key Informant, 38 years old)

They (pharmacy clients) say that it (antibiotics) will treat whichever sickness is ailing them, for example they say I want flagyl for diarrhea or stomach ache and septrin or Amoxil for coughs (Key informant, 39 years old)

Requesting for the antibiotics by pharmacy clients is a communication process that begins with decision about the message to be conveyed to the pharmacy personnel. It involves key elements of interpersonal communication process which facilitates the selection, acquisition and subsequent use of the antibiotics. The social, cultural and physical context in which the person becomes ill and the varied sick roles influences antibiotic seeking

behavior. When the patient feels a change in the physiological functioning of the body, he or she organizes the symptoms and signs into a recognizable pattern and gives it a name and etiology of the illness (Kleinman, 1980). Depending on the participants perceptions about the illness and economic factors, the participants decide whether to consult a physician for proper diagnosis and treatment or to acquire drugs from the pharmacies without prescriptions.

At the pharmacies, the pharmacy client communicates their intentions for treatment options through verbal or written mediums. The pharmacy clients verbally requested for the antibiotics they wanted by telling the symptoms of their illnesses or by mentioning the name of the antibiotics. Interestingly, there are some familiar brand names of antibiotics products that dominate over others (see table 4.3). This indicates that the drug consumer has made up his or her mind leaving no room for discussion on diagnosis and choice of drug for that particular illness with the health care provider.

The pharmacy clients also requested for the antibiotics by verbally describing their illnesses implying that they acquired the antibiotics without prescription. The assessment of the pharmacy clients' illnesses and the decision to prescribe and/or dispense the antibiotics by the pharmacy personnel is based on the pharmacy clients' own descriptions about how they felt. Pharmacy clients' therapeutic outcomes from medication with the antibiotics could not be established since it is not clear whether the prescriptions were based on accurate description of the illnesses. It is not clear if indeed the pharmacy clients were authoritatively able to describe their symptoms and were able to acquire the right antibiotics for that illness.

It should be noted that a client who comes to the community pharmacy with a piece of paper on which the name of the drug was written could be a formal or non-formal prescription. The prescriber was also not known. Any person who knows the names of drugs or any support staff working in health facilities might have provided such "prescriptions". Symptomatic relief with over the counter medications allows individuals to manage illness complaints, especially those not validated by doctors (Kamat & Nitcher, 1998).

Some pharmacy clients requested the antibiotics by mentioning the group to which the drug belong for example antibiotics, an indication that they felt capable of diagnosing their conditions and the supposed remedy for these conditions. This perceived knowledge about the use of the antibiotics gave the respondents confidence such that when they visit the pharmacies they believe they already 'know' what the specific antibiotics is indicated for. This is a perception that may result in wrong choice of drugs and treatment. This is because previous illness may appear the same yet not the same antibiotics may be used to treat the illness.

5.2.3 Type of acquisition of the first-line antibiotics

Majority (73%) of the pharmacy clients interviewed purchased the first line antibiotics without prescription. The remaining 27% purchased the antibiotics with prescription (table 5.3a).

Table 5.3(a): Type of acquisition of the first-line antibiotics

Type of acquisition of the first-line antibiotics	Frequency	Percent
With prescription	28	27
Without prescription	74	73
Total	102	100

The respondents reasons for purchasing the antibiotics instead of going to hospital were because the illness was minor hence there was no need to see a health professional (34.7%); others reported that they were not satisfied by the services provided at the health institutions (21.3%); still, some reported that they took the same drugs before for the same type of illness (13.3%) and financial constraints (14.7%). Some respondents mentioned that a friend or relative or neighbor took the first-line antibiotics before for the same type of illness (6.7%), followed by health facilities being far away (4.1%). Some respondents trusted the pharmacists or those working in the pharmacies (2.8%) while others believed that the procedure was less costly (2.4%) at the pharmacy. Results are illustrated in table 5.3b).

Table 5.3(b): Reasons for acquisition of the antibiotics without prescription

Reason for acquisition without prescription	Frequency	Percent
Took the same drugs before for the same type of illness	10	13.3
A friend/relative/neighbor took it before for same type of illness	5	6.7
The illness was minor; need not see a health professional	26	34.7
The procedure was less costly	1	2.4
Not satisfied by the health institution	15	21.3
Government health facilities far away/not there	3	4.1
Financial constraints	12	14.7
Trust the pharmacists/those working in the pharmacies	2	2.8
Total	74	100

Informants in the follow-up interview provided verbatim illustrations as to why they acquired the antibiotics without prescription. Accordingly, dissatisfaction by the services provided at the health institutions was cited as one of the reasons. Thus, one informant noted that:

I went to the hospital and queued for a long time and then, they wanted money, just talking to the doctor was three hundred shillings which I didn't have (Female informant, 36 years old)

Concerning those informants who said they took the same drugs before for the same type of illness, the verbatim quotations below provides relevant illustrations:

Why should I go to the doctor if I know the sickness goes away with that medication? If it doesn't go away with that (medication) i'll go to the doctor (Male informant, 32 years old)

Another informant from the follow-up interview also stated that:

If I already know my symptoms and what medicine will make me better, I'm not going to go to the doctor so they can give me a prescription there. If I go, they'll want money for the visit, and then I have to go buy the prescription and that's more money, another cost. If I know what medication I'm going to take and will work for me, I'll go buy it and it's cheaper for me (Female informant, 27 years old)

Themes that emerged from the excerpts above reveal ambivalence towards physician consultation. Consultation fee, dissatisfaction with health facilities and other financial barriers weigh against the benefits of a physician visit for these illnesses. The participants noted that they would consult a physician for something serious. However, because they knew what needed to be done for this condition, the extra cost and other barriers seemed excessive. Economic constraints influence health care seeking and self-medication among

respondents with low socio-economic status. A study in Nigeria also reported that self-medication with antibiotics was an economical choice of treatment for some illnesses. The socioeconomic status and health experiences influenced an individual health related attitude and behavior (Ehigiato *et al.*, 2010).

The narratives indicate that informants felt that it was not worth the expense to obtain antibiotics through physician visits when other strategies such as purchasing over the counter drugs were available and perceived as safe. The cost of consulting private practitioners and the inconvenience of accessing public medical services (which often lack medical supplies) lead members of the households to engage in the self-treatment of ill household members or themselves. They consult attendants at pharmacies or experiment with medicines they have heard about through friends or relatives.

Acquisition without prescription seems appropriate because the respondents are relying on previous experience with similar symptoms. These results are troubling from a public health standpoint with regards to appropriate diagnosis and treatment, yet they are not unexpected. As Mainous *et al.* (2008) suggests, it would be expected that when patients are diagnosed and given a treatment for a condition, after the use of which they are better, they would consider that diagnosis to be correct and the treatment effective. It would be unrealistic to believe that patients would disregard previous experience in seeking care and treatment expectations (Dosh, Hickner, Mainous, & Ebell, 2000; Larson Dilone, Garcia, & Smolowitz, 2006). The reliance on previous experiences with similar ailments concurred with the findings of a study on undergraduate university students in Khartoum state (Awad & Eltayeb, 2007). In a study among Latino adults in the United States, consumers believed that physician visits for a diagnosis and prescription were unnecessary when the patient was familiar with the symptom and it had previously responded to antibiotic treatment (Mainous *et al.*, 2008).

The action of self-care of common illnesses constitutes self-reliance and expresses independence by the respondents. It also highlights the contribution of household members in primary health care. Self-medication was the first response to alleviating the symptoms. The findings further indicate that a great majority of the illnesses in this study were first tackled at the popular/domestic sector. According to Kleinman (1980) the focus in the popular sector is the beliefs of people and how these beliefs influence the kind of

actions that people take when sick. Decisions here may be individual based, family based or the entire community.

The study therefore accounts for health system inadequacies with regard to the misuse of antibiotics. Purchasing the antibiotics without prescription reflects on the inadequacy of the professional sector of health to regulate over the counter acquisition of commonly purchased antibiotics. The findings also reiterate the plurality of the medical system so that the utilization of biomedical products like antibiotics occur within the context of the professional and popular sectors. For instance, the decisions to purchase which antibiotics for which illness is based on informal or formal sources. The source of the antibiotics is the community pharmacy of which the antibiotics are purchased with or without prescription and the subsequent use of the antibiotics according to the prescriptions provided by the healthcare worker or not.

5.2.4 Adherence to advice

Pharmacy clients reported that they would discontinue taking the acquired antibiotic as soon as the symptoms disappeared (34.7%). This was followed by those who said they would discontinue when illness was relieved (20.8%). The rest reported that they would discontinue if they believed the antibiotic was not working (11.9%) and when side effects caused problems (3.0%) (Table 5.4).

Table 5.4: Reasons for discontinuation of antibiotics

Reasons for discontinuation	Frequency	Percent
When illness is relieved	21	20.8
When I believe the drug is not working	12	11.9
When side effects create problems	3	3.0
When symptoms disappear	35	34.7
Total	71	70.3

From the above results, it was evident that drug consumers discontinued taking the antibiotics despite the advice of the health care provider, with non-compliance rate observed in more than half of the respondents in the study. In prospect however, it was difficult to ascertain the validity of the pharmacy clients' responses as to why they would discontinue taking the first-line antibiotics acquired. This is because they had just acquired the antibiotics from the pharmacies and had not used them. Because of this

reason, the follow-up interview became worthwhile as it provided qualitative data on why the pharmacy clients actually discontinued taking the first-line antibiotics before the date that was advised by the health care provider. One informant in the follow-up interview noted:

I was taking it (flagyl tablets) and the illness stopped before I completed the dose so I discontinued (Male informant, 27 years old)

Another informant also stated that:

I used it for five days, was already healed, the cough had already disappeared (Female respondent, 24 years old)

Non-compliance, as indicated by the verbatim quotes above was associated with the drug therapy itself and a perception of non-severity of the illnesses. The antibiotics use behavior here can be viewed as an indicator of the degree of the seriousness of the illness. To the respondents, non-compliance was a form of self-regulation in the sense of reducing or stopping the medication. It was a way of evaluating the current state of the illness and, in general, to assert control over the illness. That is why the respondents confirmed that they stopped taking the drugs when they started feeling relieved and not as advised by the health care provider. The act of taking the antibiotics gave the respondents a sense of improved well-being and their reason for taking these antibiotics was instrumental, that is to help them lead a 'normal' life.

A study in Denmark revealed that a patient who has received a drug goes through a rational decision process, based on their knowledge and expectations. The patient's beliefs about their own illness and its severity, the expected benefits of the drugs and the costs of treatment are important predictors of compliance (Dukes, 1993). In other studies elsewhere and Addis Ababa, non-compliance with the commonly used antibiotics was also observed in more than 50% of the respondents when the respondents forgot and resumed taking drugs (Amare, Gedif, Alemayehu, & Tesfahun, 1997; Roger, 1983). Non-adherent drug consumers who want to save drugs for later use may lack the knowledge that either drugs can be spoiled or expired during storage. Moreover, their illnesses may be different than the previous ones although symptoms may appear similar (Kamat & Nitcher, 1998).

In conclusion, this chapter has presented and discussed results on the pharmacy clients' beliefs and perceptions that influenced the behavior on use of first-line antibiotics.

Results show that the pharmacy clients preferred the antibiotics either in the form of capsules, tablets or liquid preparations. Themes that emerged to account for the preferences for the dosage forms were: difficulty of swallowing tablets or capsules, belief that tablets or capsules are for adults, belief that liquid preparations are for children, perceived efficacy of tablets or liquid preparations and ease of swallowing tablets or liquid preparations. The pharmacy clients' preferences for the purchased antibiotics in various dosage forms may have been influenced by the repeated exposure to these dosage forms given their varied sick roles. The beliefs are reinforced into the individuals through history of use and prescribing patterns of the community pharmacies, private clinics and public health facilities.

Most of the pharmacy clients requested for the antibiotics by verbally describing their illnesses, implying that they acquired the antibiotics without prescription. The assessment of the pharmacy clients' illnesses and the decision to prescribe and/or dispense the antibiotics by the pharmacy personnel was based on the pharmacy clients' own descriptions about how they felt. It is not clear if indeed the pharmacy clients were authoritatively able to describe their symptoms and were able to acquire the right antibiotics for that illness.

The antibiotics were purchased without prescription by most of the respondents in the study because the illness was perceived as minor hence there was no need to see a health professional. Dissatisfaction with the services provided was also cited as one of the reasons for purchase without prescription as well as reliance on previous experience with similar symptoms. Purchasing the antibiotics without prescription reflects on the inadequacy of the professional sector of health to regulate over the counter acquisition of commonly purchased antibiotics. The findings also reiterate the plurality of the medical system so that the utilization of biomedical products like antibiotics occur within the context of the professional and popular sectors. For instance, the decisions to purchase which antibiotics for which illness is based on informal or formal sources. The source of the antibiotics is the community pharmacy of which the antibiotics are purchased with or without prescription. The subsequent use of the antibiotics according to the prescriptions provided by the healthcare worker or not.

Results showed that non-compliance to proper use of the antibiotics was noted in most of the respondents. Pharmacy clients discontinued taking the antibiotics when illness was relieved or when symptoms disappeared, when they believed the antibiotic was not working and also because of side effects. Non-compliance was perceived as a form of self-regulation in the sense of reducing or stopping the medication. It was a way of evaluating the current state of the illness and, in general, to assert control over the illness. The implication of the pharmacy clients' health behavior of using antibiotics based on the perceived seriousness of an illness leads antibiotics misuse a factor in antibiotics resistance.

CHAPTER SIX

METHODS PREFERRED BY THE PHARMACY CLIENTS FOR LEARNING ABOUT THE USE OF FIRST-LINE ANTIBIOTICS IN MANYATTA 'A' SUB-LOCTION

6.1 Introduction

The chapter presents and discusses data on the pharmacy clients' proposals towards what should be done to ensure proper use of the antibiotics in the community. It also presents and discusses data emerging from the inquiry on the preferred methods of education on antibiotics use by the pharmacy clients.

6.1.2 Respondents proposals towards the use of first-line antibiotics in the community

Pharmacy clients were requested to provide comments about what they felt should be done to ensure that the first-line antibiotics are used appropriately. An important observation is that given the knowledge status of the respondents on antibiotics use, some respondents did not know that they used the antibiotics irrationally.

However, the informants' comments to promote rational antibiotic use are classified under educational, managerial/regulatory and infrastructural measures. Educational approaches attempt to inform or persuade prescribers, dispensers, or patients to use drugs in the proper, rational and efficient way. There are many types of this approach such as in-service training, face-to-face education, small group discussions, seminars, workshops and printed educational materials. Managerial strategies attempt to improve drug decision-making by a variety of techniques including use of specific processes, forms, packages and monetary incentives. Regulatory or infrastructural approaches attempt to restrict allowable decisions by placing absolute limits on availability of drugs. These strategies rely on rules or regulations to change behavior. Interventions using this approach are limiting or banning registration, changing product registration status as well as prescribing and dispensing controls (Le grand, Hogerzeil & Ruskamp, 1999).

The informants acknowledged the effects of inappropriate use of antibiotics and the need to educate the community on proper use of this category of drugs. This justified results of the study which revealed that 55% of the respondents in the current study believed that inappropriate use of antibiotics had effects. These comments bring to light the need for an

integrated approach to address antibiotic use practices that involves drug users as well as drug prescribers and dispensers. Accordingly, Arnold and Strauss (2005) asserts that multifaceted interventions targeting both the physician and the patient are more effective than interventions focusing solely on the patient. Thus, informants reported that:

The members of the community should be taught the effects of wrong use of antibiotics (Male informant, 22 years old).

If used properly with the right directions they treat well.....we should use them (first-line antibiotics) as prescribed by the doctor and report serious reactions to the doctor. Doctors should encourage their patients to finish their doses (Female informant, 29 years old).

Residents should not start small children with powerful strong antibiotics because it may interfere with the less powerful drugs when they use them (Female informant, 24 years old).

Create an awareness of the drugs and symptoms that require their use, tell people about seeking medical attention first, not just buying drugs, then you advice on full dosage, you can even carry some to show them practically (Female informant, 26 years old)

Deducing from the narratives, the informants affirm their belief in the efficacy of the antibiotics and the need for an educational intervention for information delivery concerning utilization of antibiotics. Hence, the informants' recommendations concerning antibiotics use could be integrated and implemented with other educational methods. These can include include printed materials, seminars/workshops and face-to-face interventions. The verbatim quotes reiterates the community members' concerns for the effects of the antibiotics. The knowledge of the community members relating to acquisition and use of the antibiotics is reflected in the verbatim quotes through: one, the need for a formal prescription for the antibiotics and compliance with the antibiotic regimen; two, a sense of awareness that there is a negative effect if the atibiotics are not used correctly; and three, community education to be conducted so that the antibiotics are not used appropriately to avoid side effects.

The informants' recommendations also point to managerial strategies to refer to various restrictions on antibiotics use prescribing and subsequent use. For instance, emphasis on structured prescription, cost restrictions and endorsement by higher qualified health care provider as illustrated by the following comments:

Everyone should see a pharmacist or go to the doctor before taking the medicine.....to take full dosage of the medicines (Female informant, 26 years old)

Doctors should come and confirm at the pharmacies if they are allowed or illegal because

some can sell expired drugs or some (pharmacy personnel) are not qualified, they should do follow-up (Female informant, 33 years old)

The informants' comments also highlight infrastructural approaches for enhancing proper antibiotics use in the community. Hence the following comments:

Hospitals should be many because somebody can become sick and they don't have money so they can find somewhere cheap (Female informant, 26 years old)

If you can bring more clinics, so that many people can be helped because there is too much dust (Female respondent, 39 years old)

Drugs should be stored in a proper place if they are not they can be contaminated by heat or darkness (Male informant, 27 years old)

These findings corroborates results of the present study which revealed that pharmacy clients' reasons for acquisition of the antibiotics without prescription (73%) were perceived inaccessibility of health services (4%). Informants' availability in terms of no time to go to hospital, busy and drugs being readily available or cheap in the pharmacies (21.3%) (table 5.3b). The narratives acknowledge community members perception of a crisis in health care. The perception is that if hospitals or more clinics are developed within the community then services including antibiotics will be cost-effective to members of the community. The comments also suggest that antibiotics should be stored in safe and conducive environment.

6.1.3 Preferred methods of education on antibiotics use by the pharmacy clients

Results showed that 30% of the interviewed pharmacy clients considered walking door to door the most appropriate method of education on proper use of antibiotics. Nineteen percent of the respondents' preferred groups/peer/colleague groups and drama or role play or roadshows (21%). Seventeen percent of the respondents' preferred media, 7% were for face to face conversations, 4% for seminars or workshops and 2% for posters as shown in table 6.1.

Table 6.1: Preferred methods of education on antibiotics use by pharmacy clients

Methods	Frequency	Percent
Drama/role play/road shows	21	21
Posters/leaflets/brochures	2	2.0
Seminar/workshops	5	4.0
Social gatherings	19	19
Media	17	17
Face to face	7	7
Door to door	31	30
Total	102	100

Door-to-door education campaign was considered most appropriate method because of informants' availability. Through this approach, the researcher can knock on the community members' door and see if they are at home or visit their homes to leave a piece of educational material on appropriate use of antibiotics. Suffice it to say that a combination of both strategies of door-to-door education campaign would be appropriate. The face to face contact with community members increases the likelihood that they would remember your name and probably the message. Kleinman (1980) argues that the roles and relationships inside and outside of the immediate and extended family should be identified, for example, who is in charge of the family. This is important in home visits, for determining with whom to speak when making health care decisions. However, other informants felt that it was not the best method since some people would not be available. Furthermore, other community members would not be accommodative due to the attitude of household members to strangers. Because of this, some informants preferred social gatherings as illustrated from the responses below:

Organize in a group, announce in advance in the market or school so that you teach people, because in door-to-door people have attitudes and some people are busy, you will not find everybody in the house (Female informant, 23 years old)

You can use the chief's *barazas*³ since chiefs can easily reach people in the community (Male informant, 34 years old)

These excerpts indicate the importance the community members attach to social gatherings specifically the *baraza* as sources of information on health issues. The *baraza* provides a structured way of information gathering and dissemination. The *baraza* has traditionally functioned as a link between the national government and the communities at

³*Baraza*: A Swahili word for a deliberation meeting held by a collective group of people of wisdom. A place where public meetings are held.

the grassroots in as far as issues of development including health is concerned. This method is considered appropriate for educating the community about proper use of first-line antibiotics because it brings community members together at one place. Nonetheless, reservations are expressed for this method because some community members might not be available at the time of the meetings. This is supported by the illustration below:

Door-to door is good because not everybody will attend *barazas* (Female informant, 22 years old)

The other preferred methods of education included seminars and workshops. An informant noted that:

Seminars even in these areas and you tell people that if you buy drugs you should use them in the required way (Female informant, 24 years old)

Face-to-face education of community members through seminars or workshops can enhance short-term improvements in diarrhea case management and reduction in antibiotic use for self-limiting uncomplicated infections. Considering that gastrointestinal infections such as diarrhea and respiratory tract infections were the common medical conditions which prompted the acquisition of the antibiotics. Seminars may only appeal to a segment of the population and cannot be organized for all the residents of Manyatta 'A' sub-location. As such, it is not a guarantee that once the information on proper antibiotics use has been passed to the attendees in those seminars, it will trickle down to the rest of the community members.

Informants who preferred posters, leaflets or brochures are educated beyond literacy levels and are able to read posters or printed material on antibiotics use. Steiner, Sandler and Fagnan (2004) contends that posters and brochures in clinic waiting rooms reinforce realistic expectations from patients. They also encourage patients to ask for the most appropriate symptomatic treatments rather than to simply request antibiotics. Sola and Sadler (2003) evaluated the effectiveness of existing Spanish materials for antibiotics use education among recent immigrants in the United States. Key findings were that pictures of healthy families on posters and brochures were more appealing than pictures of sick children. Moreover, this audience was not likely to understand technical explanations about viruses and bacteria and which types of illness they cause. Interventions that are directly aimed at patients for example through brochures or leaflets appear to implicitly assume that these interventions are equally effective in reducing the use of antibiotics.

This is perhaps based on the idea that physicians' prescriptions are guided by patient expectations (Thoolena, de Riddera, & van Lensvelt-Mulders, 2011).

A study critically reviewed the available evidence to identify the most effective drug use interventions (Mugford, Banfield, & O'Hanlon, 1990) and the following provisional conclusions may be drawn. That printed materials alone are ineffective (Avorn & Soumerai, 1983; Lexchin, 1989). Leaflets, brochures and posters may not be effective methods of delivering messages about proper use of first-line antibiotics in the community. This is because some community members can throw them away and others could read them once and keep them. Moreover, there is the possibility that some community members with lower literacy level will not understand their contents. This compares to the context of the current study because Manyatta 'A' sub-location is an informal settlement and a low income setting. Some community members may not be able to read or write the contents of the leaflets, brochures or posters.

Some informants preferred health talks in schools, churches and health centers. The community-based pharmacies are in a unique position to provide medication services for their patients. They can do this by providing counseling on the use of prescription and over the counter medications, monitoring of adverse drug reactions and provision of drug information to the community. Evidence of benefits and acceptance of the above expanded role of community pharmacy services have been shown (Sarrif, 1994). Informants from the follow-up interviews thus reiterated:

You can pass by the schools, churches the way you have passed here, all those can help (Female informant, 45 years old)

You can go to the health centers and teach people around there (Female informant, 32 years old)

Results indicated that more than half of the pharmacy clients acquired the antibiotics without prescription. Other pharmacy clients also requested the antibiotics by mentioning their symptoms suggesting a level of trust on the ability of the pharmacy attendants to select appropriate drugs for the symptoms. Pharmacy attendants' counseling can minimize risks of self-medication with antibiotics. They can do this by helping such consumers in identifying illnesses which are amenable to self-medication. Pharmacy clients could also be referred to pick the most appropriate antibiotics, counseling on its proper use and monitoring for desired therapeutic outcome.

Drama, role play or road shows were also considered appropriate methods of education on antibiotics use. As much as communication campaigns have become a cornerstone of global health promotion efforts, it is important to integrate entertainment-education approach to deliver rational antibiotics use messages. Entertainment-education strategies are based on the idea that self-efficacy will lead to expected results. The approach fits well in the entertainment for education purpose of storytelling, songs, and other community-based activities that are indigenous to the community (Le grand, Hogerzeil, & Ruskamp, 1999) and this could be done through the social groups in the community such as youth groups, women groups and community *barazas*. Educational interventions focused on the appropriate use of antibiotics in the public can be successful especially when local context and barriers are adequately analyzed and addressed (Arnold & Straus, 2005; Ranji *et al.*, 2008).

Findings of the study show that public announcements and media such as radio, television, and internet were also proposed as effective methods for educating the community on antibiotic use. One informant contended that:

You can make public announcements in the community using vehicles (Female informant, 39 years old)

Another informant expressed that:

Choose one radio station that is popular in Kisumu like radio *Nam Lolwe* (Female informant, 23 years old)

The challenge with electronic media is that not all community members have access to electricity and own a radio or television. Furthermore, not all the residents are computer literate and have access to the internet. These disparities imply that some people in the community will not be able to receive the information on antibiotics use. Even those who own radios or television may miss out on antibiotic use education due to conflict of time. Based on preliminary observations, public announcements have been used to pass information on issues related to health to community members. The preferred method is appropriate since the information is passed in local languages using public address systems. This method of relaying information is mostly conducted around market places and main roads within the community and due to the nature of unplanned settlements, remote parts in the villages may not be accessible.

To promote proper use of drugs by drug consumers, it was indicated that the use of compliance aids such as symbolic labeling would be beneficial (WHO & DAP, 1998). In counseling and advising drug consumers, educational level play a role in understanding the message being told orally or in written form on the package of the drug. Therefore, appropriate counseling and advice provided by health care providers to their (actual drug consumers) treatment is dependent on their educational level. Non-compliance is particularly significant when the orally communicated information and advice is full of hasty jargon drug information. Such information may not be understood by illiterate group of drug consumers and or cannot be read or understood by all categories of drug consumers.

Studies have showed that educational interventions focused on the appropriate use of antibiotics in the public can be successful especially when local context and barriers are adequately analyzed and addressed (Arnold & Strauss, 2005; Ranji, Steinman, Shojania, & Gonzales, 2008). Indeed, the social context of healthcare disclose three structural domains of health care in society: these include professional, popular and folk domains (Kleinman, 1980). The preferred methods of education by the community members espouses the different explanatory systems possessed in each domain including interactions, settings and institutions. In this context, the proposed methods by pharmacy clients are within the domains of the household, community and the national government. In conclusion, pharmacy clients were requested to provide comments about what they felt should be done to ensure that the first-line antibiotics are used appropriately. Informants'

comments to promote rational antibiotic use were classified under educational, managerial/regulatory and infrastructural measures. Educational approaches attempt to inform or persuade prescribers, dispensers, or patients to use drugs in rational and efficient way. Managerial strategies attempt to improve drug decision-making by a variety of techniques including use of specific processes, forms, packages and monetary incentives. Regulatory or infrastructural approaches attempt to restrict allowable decisions by placing absolute limits on availability of drugs. These strategies rely on rules or regulations to change behavior.

Informants acknowledged the effects of inappropriate use of antibiotics and the need to educate the community on proper use of this category of drugs. The comments bring to light the need for an integrated approach to address antibiotic-use practices that involves drug users as well as drug prescribers and dispensers. Door-to-door campaign was the most preferred method because of the availability of the pharmacy clients. However, other informants felt that it was not the best method since some people would not be available. Moreover, other informants felt that door to door campaign would not be appropriate since some community members would not be accommodative due to their attitudes to strangers. Because of this limitation, some informants preferred social gatherings such as a *baraza* since it would bring most of the community members together at one place. The *baraza* provides a structured way of information gathering and dissemination which has traditionally functioned as a link between the national government and the communities at the grassroots in as far as issues of development including health is concerned. Reservations were however expressed for a *baraza* because some community members might not be available at the time of the meetings.

Face-to-face education of community members through seminars or workshops was also preferred. Though seminars may only appeal to a segment of the population and cannot be organized for all the residents of Manyatta 'A' sub-location. It is not a guarantee that once the information on proper antibiotics use has been passed to the attendees in those seminars then it would trickle down to the rest of the community members. Respondents who preferred posters, leaflets or brochures may be able to read posters or printed material on antibiotics use. Though some community members may not be able to read or write the contents of the leaflets, brochures or posters due to low literacy levels. Drama, role play or road shows were also preferred as appropriate methods of education on

antibiotics use. Integrating entertainment-education strategies to deliver rational antibiotics use messages are based on the idea that self-efficacy would lead to expected results. This could be done through the social groups in the community such as youth groups, women groups and *barazas*. Preference to the use of media such as radio, television, and internet is a challenge. This is because not all community members have access to electricity and own a radio or television and not all the residents are computer literate and have access to the internet.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This chapter presents the summary of the findings presented and discussed in this thesis according to the study objectives. Conclusion of the study, recommendations and areas for further research are also presented.

7.1.2 Summary

The first objective of the study explored the knowledge on antibiotics use among pharmacy clients. The findings showed that frequently purchased antibiotics by pharmacy clients in the current study were Amoxil, Septrin, Flagyl, erythromycin and ampiclox. The reasons why these antibiotics were purchased were to treat coughs, flu/cold, diarrhea, skin rashes, and *yamo*. *Yamo* is perceived as an illness causing agent and a classification of illnesses and the antibiotics are used to prevent *yamo* as well as to treat it. The disclosure of the participants' illnesses that prompted the acquisition of the antibiotics was based on self-report. It was therefore not possible to establish whether the antibiotics treat the reported illnesses by the pharmacy clients. Further, it is important to note that people reported understanding about symptoms of their illness may deviate from biomedical concepts since they experience symptoms and label them based on their cognitive framework (Kleinman, 1980).

The participants' perceived knowledge on indication of the antibiotics requested was based on socialization and history of previous experience with the drug. Pharmacy clients also knew the antibiotics by name while others did not know anything about the purchased antibiotics. This Lack of knowledge acknowledges the pharmacy client's reliance on pharmacy attendants who provided the diagnosis and prescription based on the respondents' description of their symptoms. This shows the place of drug dispensers in the process of acquisition of antibiotics. Given that the study did not confirm the qualifications of the pharmacy clerks, it is not possible to ascertain if indeed the advice on proper diagnosis and subsequent prescription was evidence based. Thus, according to Kleinman (1988), explanatory models are unlikely to be homogenous even within the same community. A person's explanatory model is likely to alter over time in response to particular medical experiences and to the clinical encounters in which the person becomes acquainted with practitioners' explanatory model.

Sources of advice for the purchase of the antibiotics were varied, ranging from healthcare providers without prescriptions to informal sources such as neighbors, friends and relatives. Without the avenue for consulting a doctor, the respondents may resort to informal sources of information such as friends, relatives or neighbors for acquisition of the antibiotics and also from previous illness experiences. The over the counter drug decision and purchase behavior particularly health seeking behavior is influenced by these informal sources. The high reliance on health care personnel for acquisition of the first-line antibiotics gives health workers a window of opportunity to promote rational antibiotic use. More than half of the pharmacy clients interviewed believed that inappropriate use of the antibiotics had effects such as drug resistant, side effects, increase in illness and death. This indicate an improved awareness of the consequences of misuse of antibiotics. However, this does not necessarily translate to proper use since more than half of the pharmacy clients acquired the antibiotics without prescription. Findings from FGDs with pharmacy clerks however revealed that drug consumers or messengers did not know if there were effects of inappropriate first-line antibiotic use.

The second objective of the study analyzed the beliefs and perceptions of pharmacy clients that influenced the behavior on use of first-line antibiotics. To achieve this objective, beliefs and perceptions that influence antibiotics use were identified in more specific terms. Results showed that the antibiotics were preferred in either capsules, liquid preparations or tablets dosage forms. Most pharmacy clients preferred capsules because of the belief that they were for adults. Others did not prefer tablets or capsules because of difficulty of swallowing. Preference for the antibiotics in liquid preparations was attributed to ease of swallowing and the belief that liquid preparations were for children. Perceived trust in the efficacy of capsules, liquid preparations or tablets dosage forms also influenced preferences of pharmacy clients to the antibiotics. The belief that capsules and tablets are for adults coincided with instances where the pharmacy clients used the antibiotics for themselves or an adult member of the household. Likewise, the belief that liquid preparations were for small children also coincides with use in children at that particular point in time.

Most of the pharmacy clients requested for the antibiotics at the pharmacies by telling their symptoms to the pharmacy attendants implying that they acquired the antibiotics without prescription. When the patient feels a change in the physiological functioning of

the body, he or she organizes the symptoms and signs into a recognizable pattern and gives it a name and etiology of the illness (Kleinman, 1980). The assessment of the pharmacy clients' illnesses and the decision to prescribe and/or dispense the antibiotics by the pharmacy personnel is based on the pharmacy clients' own descriptions about how they felt. Pharmacy clients' therapeutic outcomes from medication with the antibiotics could not be established since it is not clear whether the prescriptions were based on accurate description of the illnesses. It is not clear if indeed the pharmacy clients were authoritatively able to describe their symptoms and were able to acquire the right antibiotics for that illness. Inaccessibility of health services and perceptions of severity or non-severity of the illness influenced decisions to acquire the antibiotics without prescription. Acquisition without prescription seemed appropriate because the respondents were relying on previous experience with similar symptoms. The action of self-care of common illnesses constitutes self-reliance and expresses independence by the respondents. It also highlights the contribution of household members in primary health care. Self-medication was the first response to alleviating the symptoms. The findings further indicate that a great majority of the illnesses in this study were first tackled at the popular/domestic sector. According to Kleinman (1980) the focus in the popular sector is the beliefs of people and how these beliefs influence the kind of actions that people take when sick. Decisions here may be individual based, family based or the entire community. Purchasing the antibiotics without prescription reflects on the inadequacy of the professional sector of health to regulate over the counter acquisition of commonly purchased antibiotics. The findings also reiterate the plurality of the medical system so that the utilization of biomedical products like antibiotics occur within the context of the professional and popular sectors. The findings further indicated that respondents discontinued taking the antibiotics despite the advice of the health care provider. The respondents said they would discontinue or discontinued taking the acquired antibiotic as soon as the symptoms disappeared; when illness was relieved; if they believed the antibiotic was not working and; when side effects of the antibiotic created problems.

The third objective of the study appraised the methods preferred by the pharmacy clients for educating them about the use of first-line antibiotics. To help achieve this objective, informants were first asked to verbally provide proposals for promoting proper use of the antibiotics. The proposals to promote rational antibiotic use were classified under educational, managerial/regulatory and infrastructural approaches. These comments

highlighted the need for an integrated approach to address antibiotic use practices that involves drug users as well as drug prescribers and dispensers. Methods suggested by the pharmacy clients for educating them about proper use of first-line antibiotics included *chief barazas* which were considered appropriate because it would bring many community members together at one place. Door-to-door campaign was considered most appropriate method because of informants' availability. Door-to-door education campaign was considered most appropriate method because of informants' availability. Through this approach, the researcher can knock on the community members' door and see if they are at home or visit their homes to leave a piece of educational material on appropriate use of antibiotics. Suffice it to say that a combination of both strategies of door-to-door education campaign would be appropriate. The face to face contact with community members increases the likelihood that they would remember your name and probably the message. Kleinman (1980) argues that the roles and relationships inside and outside of the immediate and extended family should be identified, for example, who is in charge of the family. This is important in home visits, for determining with whom to speak when making health care decisions.

Ultimately, Arthur Kleinman's explanatory model of health and illness provides a framework upon which the socio-cultural factors in the use of antibiotics can be explained in this study. The model focuses on the individual patient and the subsequent explanatory model. The focus of the study was on consumer behavior in relation to the antibiotics and not on prescribing behavior. This focus on consumers is consistent with the emic perspective of the explanatory model and lay people's medical knowledge. How people view their illness in terms of how it happens, what causes it, how it affects them, and what will make them feel better is at the core of the explanatory model. Thus, the model was important in understanding the illnesses which were treated with the antibiotics and knowledge on the indication of the purchased antibiotics from the consumers' perspective. The model is concerned with what patients consider as the strategies for treating their illnesses. This was significant in understanding self-medication with antibiotics as a strategy to address illness episodes within the popular sector of health. Moreover, methods of education on antibiotics use were contextualized as strategies for proper antibiotics use to treat illnesses.

7.1.3 Conclusion

In conclusion, chapter four of the study explored knowledge about use of first-line antibiotics among pharmacy clients. This was determined through commonly purchased antibiotics by pharmacy clients, knowledge on the treatment indication of the purchased antibiotic, source of advice for purchasing the antibiotics, purpose of purchasing the antibiotics and knowledge on effects of inappropriate use of the purchased antibiotics. The dominance of women in the study and subsequently in healthcare provision was attributed to their availability at that particular point in time during the interviews. This is because the women either purchased the antibiotics for themselves or for their children, or an adult member in their respective households. This aspect points to the significance of health education about antibiotic use in the community targeting women clients. Results on age showed that most of the respondents were between ages 18 to 30 years. This factor points to the contribution of this age group in perceived or real health enhancing behaviors that relates to the use of the purchased antibiotics.

Commonly purchased antibiotics by the respondents were amoxil, septrin, flagyl and ampiclox to treat illnesses like coughs, cold/flu, head ache, boils, rashes and fatigue/malaise, stomach ache, diarrhea and *yamo*. *Yamo* is an indigenous disease category referring to a constellation of ailments including boils, rashes, coughs, measles, diarrhea, fever and flu associated with self-medication with antibiotics. *Yamo* is perceived as an illness causing agent as well as a classification of illnesses. According to Kleinman (1980), understanding the folk taxonomies of diseases is an important approach in understanding people's therapeutic approaches. A structural analysis of the cultural understandings and classification of diseases, that is folk taxonomy of diseases, can enable the understanding of people's motivations in practicing alternative medicine. The application of values to types of illness has an important influence upon the decisions people make in responding to particular episodes of sickness. These observations suggest that respondents' cultural understandings on diseases can be crucial in influencing their choices of remedy with the antibiotics.

More than half of the pharmacy clients had a perceived knowledge on the illnesses treated with the purchased antibiotics. This perceived knowledge was imparted to the pharmacy clients as a result of the processes of socialization as well as past experience with the drug. The knowledge was also imparted through advice by pharmacy attendants, further

indicating the place of drug dispensers in the process of acquisition and cultural constructions of the antibiotics by pharmacy clients. Pharmacy clients relied on informal sources for consultation to purchase the antibiotics. The health seeking behavior particularly the over the counter drug decision and purchase was influenced by informal sources. These social networks included the family, neighbors, friends and healthcare workers but without formal prescriptions. The findings showed that most of the pharmacy clients believed that there were effects of inappropriate use of antibiotics. The mentioned effects include drug resistance, side effects, increase in illness and death. The respondents perceived themselves or other patients as susceptible to negative health outcomes if they did not behave in a certain way, that is, if the antibiotics were not used "correctly". The fact that the pharmacy clients were aware of the health effects of inappropriate use of the antibiotics does not necessarily translate to proper use.

Chapter five was about the pharmacy clients' beliefs and perceptions that influenced the behavior on use of first-line antibiotics. Pharmacy clients preferred the antibiotics either in the form of capsules, tablets or liquid preparations. Themes that emerged to account for the preferences for the dosage forms were: difficulty of swallowing tablets or capsules; belief that tablets or capsules were for adults; belief that liquid preparations are for children; perceived efficacy of tablets or liquid preparations and; ease of swallowing tablets or liquid preparations. The pharmacy clients' preferences for the purchased antibiotics in various dosage forms is influenced by repeated exposure to these dosage forms given their varied sick roles. The beliefs are reinforced into the individuals through history of use and prescribing patterns of the community pharmacies, private clinics and public health facilities. Most of the pharmacy clients requested for the antibiotics by verbally describing their illnesses, implying that they acquired the antibiotics without prescription. Requesting for the antibiotics by pharmacy clients is a communication process that begins with decision about the message to be conveyed to the pharmacy personnel. It involves key elements of interpersonal communication process which facilitates the selection, acquisition and subsequent use of the antibiotics. The social, cultural and physical context in which the person becomes ill and the varied sick roles influences antibiotic seeking behavior. When the patient feels a change in the physiological functioning of the body, he or she organizes the symptoms and signs into a recognizable pattern and gives it a name and etiology of the illness (Kleinman, 1980). The assessment of the pharmacy clients' illnesses and the decision to prescribe and/or

dispense the antibiotics by the pharmacy personnel was based on the pharmacy clients' own descriptions about how they felt. It is not clear if indeed the pharmacy clients were authoritatively able to describe their symptoms and were able to acquire the right antibiotics for the illnesses.

The antibiotics were purchased without prescription by most of the respondents in the study because the illness was perceived as minor hence there was no need to see a health professional. Dissatisfaction with the services provided was also cited as one of the reasons for purchasing without prescription as well as reliance on previous experience with similar symptoms. Purchasing the antibiotics without prescription reflects on the inadequacy of the professional sector of health to regulate over the counter acquisition of commonly purchased antibiotics. The findings further affirm the plurality of the medical system so that the utilization of biomedical products like antibiotics occur within the context of both the professional and popular sectors. For instance, the decisions to purchase any type of antibiotics for specific illnesses is based on advice from formal or informal sources. The source of the antibiotics are the community pharmacies where the antibiotics are purchased with or without prescription. The subsequent use of the antibiotics is according to the prescriptions provided by the healthcare worker or not. Results showed that non-compliance to proper use of the antibiotics was noted in most of the respondents. Pharmacy clients discontinued taking the antibiotics when illness was relieved or when symptoms disappeared, when they believed the antibiotic was not working and because of side effects. Non-compliance was perceived as a form of self-regulation in the sense of reducing or stopping the medication. It was a way of evaluating the current state of the illness and, in general, to assert control over the illness.

Chapter six appraised the methods preferred by the pharmacy clients for educating them about the use of first-line antibiotics. Pharmacy clients provided comments to enhance rational antibiotic use. The comments were classified under educational, managerial/regulatory and infrastructural measures. Educational approaches inform or persuade prescribers, dispensers, or patients to use drugs in the proper, rational and efficient way. Managerial strategies attempt to improve drug decision-making by a variety of techniques including use of specific processes, forms, packages and monetary incentives. Regulatory or infrastructural approaches attempt to restrict allowable decisions by placing absolute limits on availability of drugs. These strategies rely on rules

or regulations to change behavior. The informants' proposals acknowledged the effects of inappropriate use of antibiotics and the need to educate the community on proper use of this category of drugs. This justified results of the study which revealed that 55% of the respondents in the current study believed that inappropriate use of antibiotics had effects. The comments highlight the need for an integrated approach to address antibiotic use practices that involves drug users as well as drug prescribers and dispensers.

Preferred methods of education were door to door campaign because of the availability of community members. Through this approach, the researcher can knock on the community members' door and see if they are at home or visit their homes to leave a piece of educational material on appropriate use of antibiotics. Suffice it to say that a combination of both strategies of door-to-door education campaign would be appropriate. Door-to-door campaign was also not considered appropriate by other informants since some people would not be available. Furthermore, some community members would not be accommodative due to attitude to strangers. Because of this limitation, social gatherings such as a *baraza* were preferred as it would bring many community members together at one place. The *baraza* provides a structured way of information gathering and dissemination which has traditionally functioned as a link between the national government and the communities at the grassroots in as far as issues of development including health is concerned. Reservations were however expressed for a *baraza* because some community members might not be available at the time of the meetings as well as the attitudes of some community members.

Face-to-face education of community members through seminars or workshops was also preferred. Though seminars may only appeal to a segment of the population and cannot be organized for all the residents of Manyatta 'A' sub-location. It is not a guarantee that once the information on proper antibiotics use has been passed to the attendees in those seminars then it would trickle down to the rest of the community members. Posters, leaflets or brochures were also preferred. Though some community members may not be able to read or write the contents of the leaflets, brochures or posters due to low literacy levels. Drama, role play or road shows were also preferred as appropriate methods of education on antibiotics use. Integrating entertainment-education strategies to deliver rational antibiotics use messages are based on the idea that self-efficacy would lead to expected results. This could be done through the social groups in the community such as

youth groups, women groups and community *barazas*. Preference to the use of media such as radio, television and internet is a challenge. This is because not all community members have access to electricity and own a radio or television and not all the residents are computer literate and have access to the internet.

7.1.4 Recommendations

On the basis of the findings of this study, several recommendations have been made in line with the study objectives to inform successful implementations for the intended benefits of proper use of antibiotics.

There is need to define more clearly the measures of patients' knowledge on antibiotics use in Manyatta 'A sub-location'. Patients' socio-demographics and their knowledge, beliefs and perceptions on use of antibiotics at the community level should be at the fore of policy or program design for antibiotics use. Better measures of knowledge may involve asking respondents to differentiate between antibiotics and other types of prescription medicine and to identify types of infections requiring antibiotics. Continued community-based surveys could be useful in efforts to monitor trends in antibiotic use. Such surveys will have the potential to effectively monitor antibiotic knowledge among demographic subgroups of concern.

The study recommends that a more thorough evaluation of community members beliefs and perceptions about dosage form preferences, self-medication and non-compliance in Manyatta 'A' sub-location may also be useful. The public has to be educated and told every time similar symptoms may not mean the same illness. To this end, focus groups may help develop questions that better monitor the general population's beliefs, perceptions and behavior toward antibiotics. Longitudinal tracking of these types of studies will provide important information for the assessment of public health programs.

It is recommended that a multifactorial strategy focusing on prescribers, dispensers and patients should be encouraged. Particular attention and specific advice or counseling should be provided during self-medication for all drug consumers, particularly, to drug consumers such as women, children and elderly. Structural factors such as weak drug policies that encourage over the counter acquisition of the antibiotics should be reviewed. Because of the unique cultural strategy of bypassing the formal health care system to

obtain antibiotics, emphasis should be put on the development of educational materials for the Manyatta 'A' sub-location community members.

Socio-culturally preferred methods of educating the community members in Manyatta 'A' sub-location about antibiotics use should be designed by health programs. Patient educational materials should be developed and disseminated as an adjunct to radio and television health programs and as public service messages in local-language media. Another strategy that may work would be to disseminate the messages via a promoter program. Promoters can act as a liaison to the local community and disseminate information about the appropriate management of disease and activities for prevention. These promoters can provide culturally sensitive educational materials to patients on antibiotic use and can help the community to connect with the health system and overcome conflicts in health beliefs and communication.

Since the role of pharmacists is significant in influencing antibiotics use practices, no program aimed at improving the use of antibiotics can succeed without their involvement. For example, the pharmacy shop itself may serve as a conduit of consumer education (posters, brochures, video programs), while dispensing guidelines training for shop attendants may reduce some risky practices. Motivation for medicine shop owners to participate in such activities must be taken into consideration.

7.1.5 Areas for further research

1. The primary end point of the study was use of any category of first-line antibiotics and not necessarily the outcome of antibiotic use and drug resistance. Since frequent exposure to a given antibiotic has been shown to promote drug resistance, it's possible that this overuse could already have led to resistance but culture and sensitivity based research within the community, especially on the frequently acquired antibiotics like amoxil, septrin, flagyl, erythromycin and ampiclox is needed to establish this.
2. There is a need for a study on the impact of health insurance coverage on self-medication with antibiotics.
3. There is a need for a study on the effect of community case management on antibiotic resistant

4. Future research should explore the impact of community case management on antibiotics use and therapeutic outcomes in the community.

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