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AN EXPLORATORY STUDY OF CONSUMERS' PERCEPTION ABOUT ANTIBIOTIC RESISTANCE IN PAKISTAN

By

Name of the Student

GHULAM HAIDER

Roll No: AW534828

Registration No: 10-PRI-18295

Masters of Business Administration

ALLAMA IQBAL OPENUNIVERSITY

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AN EXPLORATORY STUDY OF CONSUMERS' PERCEPTION ABOUT ANTIBIOTIC RESISTANCE IN PAKISTAN

Submitted to:

Chairman,

Department of Business Administration Allama Iqbal Open University, Islamabad

Supervised by:

Muhammad Naeem khan

Buraq Institute of science and technology

6th road, Rawalpindi

Submitted by:

Name of the student Roll no: AW534828

Registration no: 10-PRI-18295

Address: H#ZB-6881, St#08, Sec#2, Khayban-e-Iqbal, Rawalpindi

Email: haiderobs@gmail.com

Cell no: +92 3215299519

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_____

Supervisor

Viva Voce Committee

_____

External Examiner

_____

Internal Examiner

_____

Chairman

Members_____

ABSTRACT

Background: The objective of this research is to capture the perceptions of patients regarding the usage of antibiotics. Secondly, explore customers' level of understanding about the resistance of antibiotics

Method: Semi-structured interviews with 12 consumers of different age groups were recruited via convenient sampling from a population of Rawalpindi and Islamabad.

Results: Three themes emerged from the analysis, to elucidate factors affecting antibiotic use: (a) Consumers' awareness about antibiotics (b) Patient perception about the prescription of antibiotics (c) Self-medication by the patient. Consumers held mixed perceptions regarding the use of delayed antibiotic prescriptions and were often not made aware of the use of repeat antibiotic prescriptions. Patients have limited sources of medical knowledge, the role of pharmacies is also a question mark. Patients have expectations from doctors regarding treatment. There is also a gap in the implementation of DRAP rules.

Conclusion: Antibiotic resistance is increasing in our society. The main reason is the misuse of antibiotics that is prevalent in our society, e.g. self-medication, patients are taking the improper dosage and duration, high expectations, and doctor's fear of losing patients.

Keywords: Antibiotic, Consumer’s perception, Antibiotic resistance,

CERTIFICATE

It is certified that Masters of Business Administration thesis titled "**AN EXPLORATORY STUDY OF CONSUMERS' PERCEPTION ABOUT ANTIBIOTIC RESISTANCE IN PAKISTAN"** has been prepared by Ghulam Haider, Enrolment No. AW534828 has been approved of submission.

Supervisor,

MR. MUHAMMAD NAEEM KHAN

_____

Date: _____

DECLARATION BY THE SUPERVISOR AT THE TIME OF FORWARDING THE RESEARCH THESIS TO THE CHAIRMAN OF THE DEPARTMENT FOR EXTERNAL EVALUATION

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I, _____ supervisor of AIOU research student Mr._____ do hereby solemnly declare that the Research Project entitled _____ being submitted as partial fulfilment of MBA degree with specialization of _____ has been completed under my guidance and supervision and is an original work of the student except where otherwise acknowledged in the text. It has not been submitted or published earlier for obtaining any degree from this or any other university or institution.

The thesis is completed in all respects and I am fully satisfied with the quality of the student's research work. Now it is ready to be evaluated by the external subject experts.

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I, _____ Son of _____ Roll No _____ Registration No._____ Student of MBA Allama Iqbal Open University do hereby solemnly declare that the Research Project entitled _____ ___ _____ _____ __ Submitted by me in partial fulfilment of MBA degree with Specialization is my original work, except where otherwise acknowledged in the text and has not been submitted by me for obtaining any degree from this or any other university or institution.

Signature _____

Date _____

Name (in full) _____

Email: _____

DEDICATION

To my parents, the first source of inspiration for education

ACKNOWLEDGMENT

Praise is to Allah Almighty, the one testing us all at all times and making decisions about what we don't know and can't know. Writing this report appeared to be a great experience for me. It added a lot of Antibiotic knowledge while I was working on this report. If I say that this report is one of my memorable experiences in student life, then it would not be wrong.

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I will not be out of place to express my profound admiration of my parents, my wife, my brothers, and my sister for them to pray to Allah for my success.

Ghulam Haider

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Chapter # 1

Introduction

The World Bank report revealed that the Gross World Product (GWP) of the world is 75.59 trillion dollars with a 3.4% annual growth rate and the estimated market in 2017 will be 86.23 trillion dollars with a 3.5% annual growth rate (World Bank report, 2013). The share of the global pharmaceutical market is 1 trillion dollars and will be 1.3 trillion dollars in 2020; expected to grow at 4.9%, which is 1.4% more than the growth rate of GWP (2016 Top Markets Report Pharmaceuticals, 2016). According to this data, the world pharmaceutical market is 1.1 trillion in 2017, its share in GWP is 1.3%. Pakistani pharmaceutical market in 2017 is Rs. 324 billion and the biggest segment of this market is antibiotics worth Rs. 73 billion (IMS Q1, 2017). Antibiotics are used to treat bacterial infections in a very cautious and systematic manner (NICE, 2018). Third-world countries like Pakistan are suffering from some unique issues regarding the usage of antibiotics e.g. self-medication, too many generic brands & non-reimbursement markets, etc. (WHO, 2017; IMS, 2018). Antibiotics are systematically preferred in European and American countries but in a country like Pakistan antibiotics are the most preferred medicine. Doctors of developed countries prefer to treat infections by the world's best guidelines that is step by step approach e.g. first 4-5 days patient is treated symptomatically without antibiotics and then they start with Penicillin if the infection persists, followed by stronger antibiotics. Patients and doctors both are very cautious about the use of antibiotics in these countries. Patients in third world countries like Pakistan want to be infection-free within hours, severe usage of the latest antibiotics is commonly seen by doctors with the fear of losing patients. This trend leads to antibiotic resistance that is a severe issue than drought in the coming years for Pakistan (WHO, 2015).

Antibiotic Resistance (AR) is a condition when a microscopic organism, alters against antibiotics that are created to cure the illness, they cause (Ha et al., 2019). It could be a worldwide emergency and postured as one of the most prominent threats to people's health because of the misconception of consumers.

WHO published a report “World is running out of antibiotics” in 2017. In this report WHO highlights the urgent need for new antibiotics due to increasing resistance to antibiotic therapies. Under research, antibiotics are short-term solutions. This shortage will cause serious threats to human health. WHO identified a list of 12 priority pathogens which cause

pneumonia, urinary tract infections, and multidrug-resistant tuberculosis. In countries like Pakistan, the judicious use of antibiotics still needs to improve.

Patients in developing countries like Pakistan are prone to self-medication if they got the same previous infection. Due to poor financial condition the patient prefers to use the same high-grade antibiotics without consulting doctors, another worst trend is seen in countries like Pakistan that contribute to antibiotic resistance. Thirdly, patients in advanced countries have the facility of medical insurance that's a reason they prefer researched brands instead of generics (Papsdorf *et al*., 2009). Research antibiotic brands are having high quality and do not cause reoccurrence of infection if treatment is taken completely. Generic antibiotics are inferior in quality and may cause antibiotic resistance. Patients in Pakistan have the recent facility of medical insurance, but in a very limited population, that's reason generic antibiotics are prescribed very frequently. This trend in one hand encourages national companies to introduce generics at a low price (to some extent it's true) due to zero R&D expense. On the other hand, multinational companies (MNCs) are discouraged due to their high price. MNCs justify its high price due to its high R&D expenditures. A newly research, brand that reached a shelf of pharmacy costs more than 800 million $. This changing global trend discouraged MNCs and there is no upcoming antibiotic in the R&D pipeline.

Therapeutic equivalence of generic medicines has been questioning marked in different therapeutic areas including cardiovascular and neurological diseases (Berg *et al*., 2008), even though these were previously approved for human use. The same concern was raised for antibiotic treatments, despite similar in vitro antibacterial activity and pharmacokinetics profile (Vega *et al*., 2010) that could simulate more relapse and resistant patient community (Rodriguez *et al*., 2012). Similar concerns were also raised by the general public and drug regulatory authorities along with the medical community.

Marketers of pharma companies are also facing challenge that how their brand can grow very fast without resistance with their antibiotic brand. Pharmaceutical marketers must see how a consumer perceives antibiotic treatment and how they can grow their brand without resistance, because resistance with their antibiotic brand means less prescribed by doctors and less growth in sales. Thus, this research focusses on the use of antibiotics. Furthermore, previously researches have used quantitative means to measure consumers' perception whereas an in-depth understanding of the concept cannot be obtained unless a more detailed

discussion is not conducted with consumers. Therefore, this study covers the gap by conducting qualitative study.

Problem Statement:

Consumers (patients) are contributing in antibiotic resistance and how they use (with or without prescription) or compel to increase antibiotic resistance.

Research Objectives:

The objective of this research is to

- Capture perceptions of patients regarding the usage of antibiotics in Pakistan
- Explore customers' level of understanding about the resistance of antibiotics

Research Questions:

Q1. What is the consumer perception about the usage of antibiotics?

Q2. What is the perception of consumers regarding antibiotic resistance?

The rationale of the study:

The understanding of current usage of antibiotics can help doctors and patients to minimize the usage of antibiotics. Whereas patients will also come to know about its misusages, self - medications and side effects.

Chapter#2

Literature review

Consumer perception about Antibiotic resistance

Consumers' perception of medicine refers to patients' view of medicines results and are monitored to assess the delivery and quality of medicines (WHO, 2000). Whereas antibiotic resistance is a condition when microscopic organism, alters against antibiotic which are created to cure the illness, they cause ("Antibiotic Resistance," http//www.WHO.int/News). This issue is driven by numerous components such as low-quality antimicrobial and improper (under or Over) utilization of antimicrobial including self-medication (Goossen *et al*., 2005). It could be a worldwide emergency and postured as one of the most prominent threat to people health because of misconception of consumers. AR may rise due to Self-medication repetition possible raises inappropriate drug choice, drug resistance uncontrolled adverse effects or drug reactions, misdiagnosis and may be late in medical care (Hughes, 2001; Bennadi, 2014). Self-medication, which refers to utilize any medical item or taking after unprofessional suggestions in treating any sickness (Herna *et al*., 2002; Shaghaghi *et al*., 2014). Self-medication may be a common wonder, and the predominance shifts from 12.7% to 18% in Spain (Guzma'n *et al*., 2000: Carrasco *et al*., 2008), 32% to 45.5% in China (Lei *et al*., 2018; Lam *et al*., 1994), 53% in Mexico (Balbuena *et al*., 2009), and 75% within the joint together Kingdom and Chile (James and French, 2008; Fuentes *et al*., 2008). Similarly, antimicrobial utilization within the agribusiness division causes the pool of AR microbes within the animals, which are at that point exchanged to the human through expending food from the animals (Founou *et al*., 2016; Verraes *et al*., 2013). It is assessed that, in 2050, there will be more than 10 million people will be died and expected loss may be about 100 trillion USD due to AR in case no significant steps are taken to control this rising risk (WHO, 2017), and this issue is even more severe in third world countries, where antibiotics are used with consulting doctors (Alhomoud *et al*., 2017; Nepal and Bhatta, 2018). For illustration a later study conducted by the world health organization demonstrated that most of the respondents in creating nations accepted that antimicrobials might be utilized to treat viral infections (WHO, 2015). Numerous instructive medications have been conducted around the world to improve mindfulness, information, and hone in antimicrobial utilize; in any case, the impacts were not clear and changed over consider

settings (Cross *et al*., 2017; Huttner *et al*., 2010). Hence, assist prove on public awareness almost AR in particular settings ought to be required, which can be utilized to contextualize and optimize the viability of intercessions. As improper antimicrobial utilize is the essential cause of AR, reactions to this marvel prioritize to advance public awareness almost AR (WHO, 2015). In any case, it is proving that public awareness approximately AR is inadequately indeed in wealthy countries (Carter *et al*., 2016; Watkins *et al*., 2015).

In the United States, multidrug-resistance pathogens and Clostridium difficile cause over 2500000 infections each year (http://www.cdc.gov/drugresistance/threat-report-2013/index.html; Kelly *et al*., 2008). Infections caused by antibiotic-resistant pathogens rise the cost of medical maintenance (6000-30000 Dollar) (Maragakis *et al*., 2008), consequential in an assessed economic load of 20 dollar million per year ([Maragakis *et al*., 2008; Roberts *et al*., 2009). Bothe the centres for disease control and deterrence (CDC) recognize antibiotic resistance as a global health risk (Centers for Disease Control and Prevention, 2019). An investigation from 1999 about the vies of the American public towards antibiotics advised significant knowledge gaps concerning appropriate use and potential hazards (Eng *et al*., 2003). Subsequent studies demonstrate that although a important part of the American public still trusts that antibiotics are effective treatment for cold symptoms, they also statement increasing awareness of antibiotic resistance (Gonzales *et al*., 2005; Watkins *et al*., 2015). Additionally, our investigation found that almost 90% of members agreed that they could build immunity to antibiotics overtime. Over one third respondent's perception about antibiotic resistance to be a function of the human body, rather than bacteria. The misconception that human become resistant to antibiotics is not unique Americans. A study from Sweden found that over 85% of their respondents also held this trust (Andre *et al*., 2010). In addition, the WHO recently conducted a survey across 12 nations as part of their global initiative to alteration the way antibiotics are used. They search a similar part of respondents (76%) agree that the body becomes resistance to antibiotics (http//www.who.int/drugresistance/documents/surveillancereport/en/). In a study included participants from 9 European countries, Brooks-Howell *et al* (Brookes-Howell *et al*., 2012) conducted a qualitative study about antibiotic resistance and also detected a strong theme of resistance as a property of the body (Carter *et al*., 2016).

Due to self-medication of antibiotics can increase antibiotic resistance. The purpose of this study to examine the repetition of self-medication with antibiotic to treat upper respiratory tract infections in Australian Chinese migrant, recognize the utilize of antibiotic whether their

knowledge of antibiotics, attitude to and perception with self-medication of antimicrobials (Hu *et al*., 2015). Earlier study examines had recognized some migrant groups in New Zealand to have misconceptions regarding antimicrobials and a high ratio of non-prescribed antimicrobials utilize (Norris *et al*., 2010). Many Latino and Asian migrants in the United States were described to have a perception that antibiotics were essential and effective for URTIs (Mangion-Smith *et al*., 2004). Most of the Chinese migrants utilize antibiotics for upper respiratory tract infections without medical discussion in Australia. Misunderstandings regarding antimicrobials utilize were importantly associated with the repetition of self-medication in this group. The conclusions provided significant data for developing culturally responsive interventions for the right utilize of antimicrobials in Australia Chinese societies (Hu *et al*., 2015).

Inappropriate utilize of antimicrobials, as with other medicines, may prime to a number of consequences including adverse effects, allergic reactions as well as uncover able monetary expenditure. Additional specifically, unessential antimicrobial utilizes leads to antimicrobial resistance (Davies *et al*., 2010), and misuse by some patients may consequence in decrease efficacy in other. Resistance resulting from overuse of antimicrobials is a worldwide concern and World Health Organization (WHO) has advised of retreat to a pre-antibiotic era, when bacterial infections which are now relatively easy to treat will "no longer have a cure and, once again, will kill unabated" (Dunne *et al*., 2014). Antimicrobial overuse and misuse in Australia has been offset by several consumer educational campaigns which began in 2000 (Wutzke *et al*., 2007) and there was a decline in the frequency of antibiotic prescriptions distributed in public pharmacies among 1998 and 2002; however, the decline was more among children than adults (Pan *et al*., 2006). The campaigns were run by the Australian national prescribing service (NPS) Medicine wise and have received international attention; topics include the "Common colds need common sense, They don't need antibiotics" campaign (2004) which was spread via TV, print and radio, and the "Resistance Fighter" campaign in 2012 which utilized social media sites such as Facebook (http:www.nps.org.au, 2013; http:www.nps.org.au, 2015). While terms such as 'bacteria' and 'Viruses' are usually utilized by health expert, they may not be aware to consumers, especially those with limited health literacy (McNulty *et al*., 2007); for example, some patients may have a misconception that colds and Flu are reason by bacteria and can be treated with antimicrobials (Wutzke *et al*, 2007; McNulty *et al*., 2007) . National antimicrobial education campaigns that have been led in Australia (http: www.nps.org.au, 2013; Wutzke *et al*., 2007; http: www.nps.org.au, 2013;

Donovan, 2003). User misperception highlight a significant character for pharmacist in patient therapy as confusion, misunderstanding and lack of knowledge are potentially modifiable. It would be careful to follow a 'universal precautions' approach supposed that users and patients have limited well-being literacy until proven otherwise. It is significant that consumer beliefs regarding antimicrobials are also elicited as made-to-order well-being data should speech beliefs as well as well-being literacy. There is misperception between users regarding the efficacy of antimicrobials in the treatment of colds and flu and a deficiency of knowledge despite education campaigns. Over half of the users in this study were self-assessment with females more likely to self-assessment then males; however, more males were mistaken regarding the efficacy of antimicrobials for the treatment of colds and flu. The results powerfully recommend there is a need for pharmacist and other well-being care experts to elicit beliefs and understanding regarding antimicrobials and to adapt advice properly according to the well-being literacy of each patient (Fredericks *et al*., 2015).

The reality that community alertness on antimicrobial resistance (AMR) is dangerous for fight against AMR, community alertness is far from adequate even in advanced nations. Investigations from the USA and Europe reported that more than 25% of the community think that antimicrobials are an actual treatment for the common cold (Carter *et al*., 2016; European commission (2016) special Eurobarometer 445 "Antimicrobial Resistance"). The situation is even worse in establishing nations, where the widely held of respondents believed that antimicrobials work counter to viral infections in a current WHO investigation (WHO (2015) Antibiotic Resistance: with multi-country public awareness survey. WHO press, Geneva, Switzerland). More people agreed that the common cold is reason by viruses (53.2-61.4%). Over 90% of respondents reported that they had not ever demanded antimicrobials for common cold. However, about 30% replied that they had taken "leftover" antimicrobials without prescription. In a huge study in the USA, approximately 25% answered that antimicrobials work counter to the common cold (Watkins *et al*., 2012). A current EU study presented that 44% unsuccessful to respond appropriately to an alike question (European commission (2016) special Eurobarometer 445 "Antimicrobial Resistance"). In a worldwide survey led by WHO, the widely held (64%) of respondents thought that antimicrobials are actual counter to the common cold (WHO (2015) Antibiotic Resistance: with multi-country public awareness survey. WHO press, Geneva, Switzerland). Our consequences presented that that association of different issues with perception was complex. The effect of demographic characteristics that were not associated with knowledge (sex, material status,

parental status) shows that perception likely strongminded by combination of emotional issues and knowledge. Those who are wedded or have children might respect AMR as a huge danger to their families and themselves than single adults do (Cwirko *et al*., 2014; Tahtinen *et al*., 2009). We established that the overall knowledge about antimicrobials and antimicrobial utilize in suboptimal in Korea (Huh *et al*., 2018).

Antibiotic resistance VS antibiotic excessive use

Antibiotic resistance is a state when microscopic organism, alters in ways that empower them to resist the impacts of antibiotics, to which they previously succumbed (What is antibiotic resistance, 2017). Each dose of antibiotic utilized increments the like hood of antibiotic resistance (Phelps, 1989). Australia is contributing to the global problem of anti-microbial resistance with an antibiotic consumption rate over the association for economic co-operation and advancement (OECD) normal (OECD, 2015). Successful administration of anti-microbial resistance requires partnerships and conscious contribution of individuals, including each prescriber, wellbeing professional and consumer. Australian consumers expect information on prescribed antibiotics, which empower suitable utilize, and a GP counsel conducted in a way that increments consumer confidence within the treatment choice. To more completely lock in buyers as accomplices in moderating antibiotic resistance, consumer information needs with respect to prescribed antibiotics must be addressed to; shared desire between buyers and GPs in maintaining a strategic distance from the utilize of antibiotics ought to be energized; assets such as the return of undesirable medications benefit ought to be broadly advanced; and the utilize of clearer wording and the improvement of unused emphases recommended by this think about for open wellbeing campaigns ought to be backed. Administrative changes to the national pharmaceutical endowment conspire to expel oral antibiotic repeats and to diminish the period of validity for oral antibiotic prescriptions ought to be ordered. This considers providing valuable knowledge into the viewpoints, attitudes and behaviours of Australian customers towards antibiotic utilize and antibiotic resistance, and displayed pertinent suggestions for Australian public wellbeing arrangements and hone (Lum *et al*., 2017).

Excessive use of antibiotics is defined in European study where misuse was seen by patients, who exert unnecessary pressure on doctors to get prescription of antibiotics by exaggerating symptoms, by non-bacterial infections (e.g. Flue, cough, sore throat, etc.) and one of their

motives is to save some medication for future use (Austin, D. J., Kristinsson, K. G., & Anderson, R. M. 1999; Grob, P. R. 1992), there are many obstacles between prescription of antibiotics and till it reaches in the stomach of patients.

Despite legal restrictions, the availability of antibiotics without prescription is also reported in many countries not only in the west, but that is even more evident in low-income countries. A study conducted in Katmandu, Nepal, revealed that pharmaceutical retailers are directly involved in the treatment of patients (Wachter, D. A., Joshi, M. P., &Rimal, 1999). In another study of European children similar results were found in Spain (Ramalle *et al*, 1999) and Germany (Hoppe *et al*., 1999).

Our work offers an illustration of the benefits of inserting inquire about, characterized as work utilizing operational funds to integrate scientific methods into projects addressing to the down to earth needs of an association to supply generalizable information. Hence, although antibiotic stewardship and mixed methods studies are not novel, this paper presents a modern show or inquire about that consolidates providers' perspectives and contributes to the translation and approval of quantitative discoveries. We found that surrounded qualitative investigate not as it was moved forward in our understanding of quantitative discoveries, but productively formed our mediation in ways that would not have been possible something else. Stage 2 of us inquire about contributing to our capacity" to get it and work in real-world' or regular hone settings, paying specific consideration to the audience that will utilize the investigate, the setting in which execution happens, and the variables that impact implementation" (Academy Health, 2012; Peters *et al*., 2013). We hypothesize that qualitative investigate about can give a clearer understanding of variables impacting hone designs at the point of care and lead to more effective healthcare delivery mediations (Flottorps *et al*., 2013; Grol 1997; Rabin *et al*., 2008). Moreover, as omnipresent utilize of EMR (Electronic Medical Record) systems offers moved forward openings for quantitative analytics, implanting complementary subjective strategies into enhancement endeavours is conceivable, essential, and likely to lead to more productive intercessions and way better care conveyance. Collaboration with clinic and operations pioneers all through this handle advertised quick capacity to apply discoveries inside change endeavour. Eventually, our experience leveraging subjective strategies to target low value antibiotic utilize can be a show for other learning healthcare systems undertaking care advancement endeavours, since these strategies can be promptly applied to other maladies, specialist and partners to effectively broaden the assessment of clinical challenge at the point of care (Munoz-plaza *et al*., 2016).

Unseemly antibiotic prescribing, especially for respiratory tract infection (RTI) in ambulatory care, has ended up at around the world public wellbeing danger due to coming about antibiotic resistance. In spite of numerous interventions and campaign, wide varieties in antibiotic utilize hold on between European nations. Social determinants are often referred to as a potential cause, but are once in a while characterized. For our information, so distant no systematic literature review has centred on social determinants of antibiotic utilize. The point of this consideration was to recognize social determinants, on a country-specific level of the ambulatory care in Europe, and to describe the impact of culture on antibiotic utilize, employing a system of social measurements. The significance of studying culture within the context of antibiotic utilize has often been highlighted (Grigoryan *et al*., 2006). Exhort that procedures and campaigns to improve the circumstance should consider social determinants (Hulsher *et al*., 2010). The context of European ventures is particularly significant to ponder culture impacts. Raising social mindfulness may be useful to extend the chances of victory of European ventures concerning antibiotic utilize as well as on an individual level, making a difference the GP to way better get it patients' desire amid the therapeutic consultation. Indeed, although Hofstede's social measurements are the foremost habitually examined in affiliation with antibiotic medicine, numerous other systems have been described. Narrowing the social investigate field to Hofstede's measurements seem to demonstrate deluding. It would be more secure to consider a broader system for advance social investigate, such as those recognized by those who turn to 121 distinctive instruments to measure culture (Taras *et al*., 2009). Social components ought to be considered as exerting an omnipresent impact on all the successive stages of the illness process and appear closely connected to education. Interactions between determinant categories, social measurements and antibiotic utilize in essential care are different, complex and require to assist examination inside covering disciplines. The context of European ventures appears especially important (Lundgren *et al*., 2015).

Many individuals; particularly the poor, to a great extent depend on casual health care providers (Olenja, 2003) and genuinely they are not qualified sufficient to offer quality wellbeing services for the community (Ahmed *et al*., 2007). The most objective of this study was to investigate whether the antibiotic administration is rationale or not, among the rural peoples of Bangladesh as well as to decide the mindfulness of country individuals toward the rational utilize of antibiotics. Physician's point of view concerning prescribing antibiotics and realities, finding approximately antibiotic resistance was moreover considered within the

show overview. The results about of this ponder represent the current circumstance of antibiotic utilize within the rural area of Bangladesh. Comparable study about ought to be conducted throughout the nation to induce the current antibiotic prescribing pattern and utilization situation all through the nation. Instructive mediations to advance judicious utilize of antibiotic and mindfulness of the pernicious effect of unreasonable prescribing habit on the community and all members of the wellbeing care framework are required. Mass mindfulness campaigns or public healthcare campaigns ought to be introduced to address the utilize and misuse of antibiotics (Sutradhar *et al*., 2014).

Resistance to antibiotics could be a major worldwide wellbeing issue (WHO, 2016; Doh, 2013), with overuse of antibiotics a key aspect (Goossens *et al*., 2005;Costelloe *et al*., 2010). Preserving antibiotic sensitivity through the administration of self-limiting respiratory tract infections (RTIs) without a plan of action to antibiotics could be a need (WHO, 2016; Glasziou *et al*., 2004; Del mar *et al*., 2006; Arroll *et al*., 2006; Ahovou-Solorana *et al*., 2008; Smucny *et al*., 2004). In spite of clear clinic rules (NICE, 2016) and prove that antibiotics are ineffectual for coughs, colds and sore throats (6), have iatrogenic results and increment susceptibility to infection (Costelloe *et al*., 2010), numerous patients proceed to inquire for and get antibiotics (Hawker *et al*., 2014). The discoveries affirm that patients have different desires of RTI meetings with non-medical prescribers (NMPs), counting data and back for self-management, antibiotics and non-antibiotic medicine for symptom relief. This can be in line with the discoveries from inquiring about on patient desires of RTI discussions with GPs (McNulty *et al*., 2013). The alignment between the desires detailed by patients and seen by NMPs recommends that NMPs effectively investigated persistent desires, supporting past discoveries that nurse prescribers are talented at evoking understanding expectations (Stenner *et al*., 2011). NMPs illustrate an understanding of patient expectations of RTI meetings and utilize a run of non-antibiotic administration procedures, especially in terms of taking a patient-centred approach. Generally, the patient's desires were met and prescribers were not excessively impacted by patient desires for an antibiotic. Patients were fulfilled with the consultation, showing that the techniques utilized by NMPs were worthy. In any case, the lower levels of fulfilment among patients who anticipated but did not get an antibiotic demonstrate that in spite of the fact that NMPs show up to have procedures for managing RTI discussions, there's still scope for advancement and these prescribers are subsequently an imperative gather to include in antibiotic stewardship (Courtenay *et al*., 2017).

Antibiotic resistance is one of the most prominent public wellbeing challenges confronting humankind within the 21st century. Current evaluations, recommend that antibiotic-resistant bacteria (ARB) are dependable for at slightest 23000 deaths per year within the U.S $25000 passing per year in Europe, and hundreds of thousands of passing in lesser developed nations and regions (Bougnom *et al*., 2017). The European commission estimates that the costs related to antibiotic resistance infections surpass Euro1.5 billion per year (European Commission on anti-microbial, 2017), whereas within the U.S. one estimate recommends the costs are a stunning $55billion per year (Gandra *et al*., 2014). Tragically, these startling numbers are as it was getting more regrettable with the proceeded development and dispersal of multidrug resistance (MDR) "superbugs" that at the same time show resistance to a different antibioticclasses. At long last, it must be recognized that antibiotic resistance does not regard territorial or universal borders. Worldwide monitoring efforts will give understanding into how local policy, hone, and socioeconomic impact antibiotic resistance. Worldwide collaboration and information sharing are in this way fundamental for characterizing baselines and relief conclusion focuses to avoid and contain resistance in arranging to preserve antibiotics as a valuable asset for future generations (Viksland *et al*., 2017).

Patient Perceptions of Generic Medicines

Patients' perception of medicine refers to patients' view of medicines results and are monitored to assess the delivery and quality of healthcare (WHO, 2000). Patients feel difficulty in reading the leaflets of medicines which are written in technical terms, there is a need to use the pictorial method to elaborate information where it is possible. Despite many efforts of healthcare professionals and others, patient informational interventions can most of times unsuccessful due to this limitation (Cene, 2013), readability and understand ability of leaflets and other drug-related information is essential for the development of patient perception about generic drugs (Dunne *et al*., 2014). However, limitation to this study is the bias due to some interviews conducted at clinics, and location of the interview may influence participants (Elwood & Martin, 2000). The majority of patients do not have a favourable attitude towards generic medicines which highlights the scope of patient education that will not only lead to improving patient confidence but also help to increase acceptance of generic drugs. A perquisite of

education interventions is considered as vital to make sure readability of generic medicine's leaflets (Patel *et al*., 2010; Quintal & Mendes, 2010; Sharrad&Hassali, 2011; Patel *et al*., 2012; Shrank *et al*., 2009). Different authors explored that generic drugs faced quality problems for some patients due to the difference in excipients (Coloe&Zirwas, 2008).

The affordability of generic medicines is more compared to the research, brand and at the same time no difference in ineffectiveness. Generally, generic medicines are felt as less safe and less in quality as compared to innovators, except few local manufacturers are reputable. This association is more positive in younger GPs. Older GPs and consultants feel a negative association between these factors and generic medicines. Jamshed *et al*., 2012 explored perception, real understanding and attitude of physicians regarding the prescription of generic medicine. Mixed attitudes and perceptions were identified for generic medical usage. Quality of medicines, therapeutic efficacy and suspicious behavior towards local pharmaceutical manufacturers were few of implicating factors which are obstacles to generic medicines prescribed (Jamshed *et al*., 2012). Other strong influential factors are the socioeconomic circumstances of end-users.

Jamshed *et al*., 2012 identified that the majority of GPs are interested to prescribe low-cost generic medicines although GPs are reluctant to prescribe few therapeutic categories of low-cost generic medicines. Doctors feel that local manufacturing companies lack quality checks and the intensity of these feelings increases with the experience of practitioners (Jamshed *et al*., 2012).

Patient compliance and awareness

Compliance is defined as “the extent to which the patient’s behaviour matches the prescriber’s recommendations” (Horne *et al*., 2005).In Jordan, a few later studies uncovered a significant level of antibiotic agents' misuse (Al Bakri *et al*., 2005). Nearly half of the members purchased antibiotics without prescription. Purchases were either self-directed or made upon pharmacist's recommendations, of which one-third were improper (Al Bakri *et al*., 2005. Additionally, uncover a tall predominance of self-medication with antibiotics, seen in 40% of the sample. The ponder members primarily utilized leftover antibiotics at home or purchased them from drug store without a prescription. Variables related to self-medication were age, pay level, instructional level, and past encounters with antibiotics (Al Azzam *et al*., 2007). This was a graphic cross-sectional questionnaire-based study. Information was

collected throughout Eminent 2011 through February 2012. The issue of antibiotic resistance in Jordan and internationally antibiotic resistance could be a genuine wellbeing concern locally and around the world (European centre for disease control/European medicine agency, 2009). The world health organization (WHO) has detailed expanding levels of antibiotic resistance, which are threatening the control of infectious maladies (WHO Antimicrobial resistance, 2012). Misuse of antibiotics and the lack for mindfulness are the principal reason for the rise of antibiotic resistance, which jeopardizes the maintainability and viability of these important drugs (Carlet *et al*., 2012). The recognized crevices in public mindfulness and hones relating to antibiotics ought to serve within the plan of instructive campaigns to handle the issue of antibiotic misuse. The literature advises to focus on activities that point in changing the behaviour of both public and health care experts instead of the simple arrangement of data (Finch *et al*., 2004). So distant, then studies about conducting in Jordan have been moderately little, clear ones. T Large scale ponderous to evaluate the magnitude of antibiotic buy and Interventional studies about to play down the level of misuse and to a measure, the effect of medications on really hones are required. On the off chance that any alterations to the current circumstance are to materialize, the health specialists must take genuine steps towards restricting access to antibiotics and raising the community's mindfulness of the dependable to utilize these drugs (Darwish *et al*., 2014).

Antimicrobials are drugs that either kill or inhibit the development of the microscopic organism, antibiotic can be either bactericidal or bacteriostatic separately. A more common term anti-microbial as infections, protozoans, helminths', and others. (Mainous *et al*., 2008). A questionnaire was arranged and information was collected from the patients based on which the ponder was carried out. A very high utilization of antibiotics was observed. Cephalosporin were found to be the foremost commonly utilized antibiotics. In spite of government controls, the dispensing of antibiotics is very high in drug stores and consequently, wellbeing instruction programs ought to be taken to the patients concerning antibiotics. Reasonable and maintainable intercessions ought to be executed to advance the judicious utilize of antibiotics that will help in decreasing the threat of antibiotic resistance (Maheshwari *et al*., 2015).

The emergence and spread of antibiotic resistance are recognised as a worldwide issue. Its prompt consequence is that, as it were a limited number of antibiotics, and in some cases, even no antibiotic is accessible for the treatment of diseases caused by safe microscopic organisms. Other direct results for patients incorporate postponed organization of appropriate

antibiotic treatment, longer stays in hospitals, higher health care costs and poor patient results (Cosgrove *et al*., 2006). Around the world, activity is in this way necessary to deflect a looming risk to human health (Carlet *et al*., 2012). Following the European Union (EU) board suggestion on judicious utilize of antibiotic agents in human medication in 2001, and the victory of national campaigns, i.e. Belgium and France, the European centre for disease prevention and control (ECDC) chosen to set up the European Antibiotic Awareness Day (EAAD) on 18 November as stage to back national campaigns across Europe. This article gives a overview of EAAD instruments, materials, and exercises created amid the primary five a long time. It appears that EAAD has been effective due to greater participation between ECDC and national institutions, solid political and partner back and evidence-based improvement of campaign materials. EAAD has given a stage for pre-existing national campaigns and encouraged similar campaigns to create where not one or the other political support had been secured, nor money support had been accessible. As a result, participating nations has ceaselessly communicated solid support for ECDC to proceed its work on EAAD. This has been embraced by a steadily expanding number of nations taking an interest and the developing intrigued of varied professional and partner organizations. We conclude that EAAD ought to proceed, to act as a catalyst for discussion and mechanism to raise awareness of the public and prescribers approximately the judicious utilize of antibiotics (Earnshaw *et al*., 2014).

In the united states, antibiotic resistant diseases influence more than 2 million individuals each year, account for at least 23,000 passing, and have a total to the financial burden that surpasses $20 billion in direct health care costs alone (centers for disease control and prevention office of infectious disease, 2013). Overtreatment with antibiotics has been identified as the major factor driving to antibiotic resistance around the world centers for disease control and prevention office of infectious disease, 2013). Roughly 30% of antibiotic prescriptions in US outpatient settings are considered to be pointless (The pew charitable trust, 2017). In this manner, efforts amid at understanding patient and provider level variables that contribute to the overprescribing of antibiotics within the outpatient setting are fundamental (Drekonja *et al*., 2015; MacDougall *et al*., 2005). The demographic characteristics of the study respondents. The normal age was 46 years. Respondents were generally female (77%), non-Hispanic whites (71%), college taught (71%), and were not guardians of children who had taken an antibiotic within the past 2 years (75%). This is thought about investigating quiet convictions antibiotics, their information and mindfulness

of the suitable utilize of antibiotics and antibiotic resistance, and their desires concerning the utilization of antibiotics in their treatment. Our discoveries are reliable with earlier investigating. In a huge study of U.S. customers, 26% reported anticipating an antibiotic from their supplier amid a visit for cough or cold (Watkins *et al*., 2015). In our test, 22% reported having a comparable desire. Moreover, surveys with worldwide samples found that people with lower levels of education were less likely to get it the appropriate utilizes of antibiotics compared to those with higher levels of instruction (McNulty *et al*., 2016; WHO, 2017). Ours ponder moreover found that those with a lower level of instruction were less likely to accurately get it the appropriate utilizes of antibiotics than those with a higher level of education. Reducing the improper utilize of antibiotics in outpatient settings will require the advancement of techniques that address both patient and provider level factors that affect prescription hones. This is thought about recognizing a particular require for communication support materials that offer assistance providers to clarify to patients when an antibiotic is or isn't required to treat their sickness. This strategy component, together with appropriate patient level education materials that are simple to get it, is basic to assist patients set reasonable desires concerning the role of antibiotics in their treatment (Davis *et al*., 2017).

Patient self-Medication regarding antibiotics

Self-medication refers to the utilize of medications to treat self-diagnosed disarranges without counselling a therapeutic practitioner and without any medical supervision (WHO Guidelines for the regulatory assessment of medicinal products for use in self-medication, 2015). Antimicrobial self-medication is highly prevalent in resource-restricted nations and is commonly related to inappropriate utilize. Although self-medication is a purport-insect alternative to the formal wellbeing sector, particularly in most LMICs, it is imperative that choices to utilize non-prescription, anti-microbial agents are both secure and suitable in case the potential benefits are to be maximized with minimal risks. Educational intercessions focusing on both wellbeing personnel and community members in expansion to improving get to the quality of public healthcare, authorization of regulations on non-prescription medication utilize and lessening the burden of infections maladies seem to offer assistance relieve the challenge of non-prescription anti-microbial utilize in LMICs. The hone of referring to old prescriptions and past fruitful treatment experiences by the communities is key zones of the focus for the mediations. There's a pressing ought to develop and approve a

strategy for collecting information on community anti-microbial utilize to assist improve the quality of evidence from such survey studies (Ocan *et al*., 2015)

The design of medicine utilization could be an imperative wellbeing pointer because it makes a difference to decide the predominance of illness among particular populaces and gives data concerning the utilization of therapeutic resources. From this viewpoint, self-medication picks up a part of significance, because it may meddle with a conclusion and, frequently, the common course of an ailment. Self-medication hones not supported by exact restorative information can antagonistically influence the wellbeing of the customer by driving to perilous adverse drug reactions (ADRs) or drug intuitive. In an advancing economy like India, self-medication is commonly practiced because it is less costly and due to the accessibility of numerous drugs without medicine from an enrolled therapeutic specialist. As apropos portrayed by WHO, mindful self-medication can offer assistance avoid and treat common minor afflictions at a negligible taken a toll to the patient. Though self-medication could be a common hone in university understudies, irrespective of the course they are examining, there's a shortage in their information concerning the same. This highlights the require for expanding mindfulness among understudies concerning risks of self-medication (Sharma *et al*., 2015).

Self-medication may be an all-inclusive challenge that requires consideration since of the potential danger, not as it was for the pregnant ladies but too to the unborn child. Information on self-medication hone and indicators among pregnant ladies is missing in Tanzania. Data on the impacts of this hone on the pregnant lady and the baby universally is additionally insufficient. This was a cross-sectional ponder which was conducted utilizing confront to confront meet with 372 pregnant ladies in Makongoro wellbeing middle. The semi-structured survey was utilized. Information was examined utilizing STATA 13. The predominance of self-medication with cutting edge drugs and homegrown drugs among pregnant ladies in Tanzania is alarmingly tall. The home is common among the ignorant, unemployed and amid to begin with trimester of pregnancy (Marwa *et al*., 2018).

In Pakistan, around 79% of essential care is given by a private segment that can be a cause of self-medication hones (Shaikh, 2015). The contributing factors to the high prevalence of self-medication in Pakistan incorporate: ease of getting to medications, the need for healthcare information, excessive marketing, lacking requirement of administrative approaches (Arshad *et al*., 2010; Hussain *et al*., 2010; Khan *et al*., 2014; Aqeel *et al*., 2014). Destitute availability

to health care gets to figure out the high prevalence of self-medication hones (Khalid *et al*., 2016). More than half of all solutions sold in Pakistan are provided without prescription (Mansoor, 2013). Analgesics, antibiotics, anti-diarrheal agents, anti-histamines, antipyretics, cough-suppressants, tonics, and vitamins are promptly accessible without prescription from community drug stores in Pakistan (Arshad *et al*., 2010; Hussain *et al*., 2010; Khan *et al*., 2014; Aqeel *et al*., 2014). Due to the elevating sale of non-prescribed medications self-medication rate is consistently expanding in Pakistan (Khan *et al*., 2014; Aqeel *et al*., 2014; Khalid *et al*., 2016). Still; there is no national and provincial study. We inspected the pattern of pharmaceutical offerings in community drug stores and assessed self-medication hones in Punjab, Pakistan. This ponder demonstrates a sale of numerous types of medicines without prescription from community drug stores and means poor usage of the NDP. Self-medication hones are common in individuals over a run of socio-demographic characteristics, illustrating genuine issues of health, education, reasonableness, and health officials in Pakistan. Wide education programs like wellbeing seminars and campaigns in communities ought to be prompted by the government and proceed on a regular basis. The government ought to encourage public with satisfactory healthcare services. Pakistan too needs arrangement execution to screen medication sales and to control and direct the excessive sales of non-prescribed medications. The promoting of medicines to the public ought to have limitations (Aziz *et al*., 2018).

Self-medication hone (SMP), as one component of self-care, is the utilize of medicine without the prescription of wellbeing care experts (e.g. resubmitting ancient prescriptions, sharing the medicine with relative/family individuals or utilizing remaining medicine) for the treatment of self-recognized sickness (WHO responsible self-care and self-medication, 2010). Universally, the prevalence of SMP is conflicting extending from 32.5 to 81.5% (Lam *et al*., 1994; Sanghani *et al*., 2008; Phalke *et al*., 2006). In Ethiopia, the prevalence of self-medication hone ranges from 12.8% to 77.1% (Ayalew, 2017). More than one-third of pondering members practiced self-medication. Factors like being single, presence of medicine at home, accessibility of pharmacies peer pressure and past experience of SMP were the indicators of self-medication hones. Fortifying of the communities' awareness on the side impacts of self-medication hone and control of drug stores are exceptionally vital mechanism to decrease the hone. Hence, coordinates efforts of individuals, communities, health offices, and the regulatory bodies are exceeding important (Kassie *et al*., 2018).

‘Self-medication' could be a worldwide wonder. On the one hand, it is seen as an expensive component of self-care, which depends intensely on the consumer's mastery in terms of involvement of the shopper, when it comes to medicine utilize. On the other hand, if not practiced accurately, it can lead to different issues counting mishandle and medicate resistance. The WHO rules 2000 characteristic self-medicate as the utilize of medicine by an understanding of his claim activity or on the exhortation of a drug specialist or a lay individual rather than counselling a therapeutic specialist. Whereas in most of the created world, it is synonymous with the utilize of over-the-counter solutions (Hardon Anita *et al*., 2001). A manual look technique was embraced to get investigate papers on self-medication in creating nations. The look was carried out utilizing PUBMED, Ebsco, ProQuest and google researcher look motors and the keywords utilized for the look were self-medicating, reasons, and determinants. An add up to 52 study articles were hence gotten. As per the directing standards in self-medication (WSMI, 1998) "the to begin with key to creating a medicate arrangement which incorporates self-medication is to draw a refinement between those items which require more dynamic inclusion by a specialist or other qualified wellbeing proficient for secure and successful use prescription medications, and those items which are secure and compelling for utilize by shoppers on the premise of theirs showcasing authorization and labelling non-prescription medicines" (Parulekar *et al*., 2016).

Trials taken to achieve well-being and freedom from sickness are distinctive based on the attitudes and experiences of people. Convictions, sentiments, and thoughts of a person altogether impact his/her understanding of a sickness, which in turn influences the decision taken to address it (Leyva-Flore *et al*., 2001). According to the World Health organization, self-medication is the choice and utilize of the medicines by people to treat self-recognized ailments or symptoms (WHO. The role of the pharmaceutical in self-care and self-medication, 2016). Self-medication hone is prevalent in Ethiopia and shifts different populaces and locales of the nation. A few of the self-medication hones are hurtful and require to provoke activity. Special attention ought to be given to educating the public and wellbeing care providers on the types of sickness that can be self-diagnosed and self-treated and the types of drugs to be utilized for self-medication (Ayalew, 2017).

Dermatology could be a diagnostically challenging and different field encompassing infectious, immune system, allergic, and neoplastic conditions. In the United States, there's a deficiency of board-certified dermatologists (Kimball *et al*., 2008; Resneck *et al*., 2004). To meet the healthcare needs of our population, dermatological conditions are frequently

assessed and treated by providers not formally trained within the field. Among these providers exists a wide extend of dermatological expertise (Federman *et al*., 1999). Since the early 20th century, which proclaimed the discoveries of penicillin by Sir Alexander Fleming (Ligon, 2004,), providers' abuse of anti-microbial treatment has been called to this issue (Spellberg *et al*., 2014). It is assessed that up to 30% of all mobile anti-microbial prescriptions are improperly given, accounting for 153 prescriptions per 1000 populace every year (Fleming-Dutra *et al*., 2016). These statistics are somewhat constricted for the inpatient setting, although unseemly utilization may still reach upwards of 10% (Hecker *et al*., 2003). Worse yet, however, anti-microbial stewardship because it relates to dermatology remains a moderately unexplored concept as it was a handful of ponders have stressed the dermatologist's direct role in more thoughtful management of anti-microbial both topically and systemically (Chon *et al*., 2012; Thiboutout *et al*., 2009; Dreno *et al*., 2014). Avoidable anti-microbial utilize is an emerging public wellbeing crisis. In dermatology alone, roughly 7.6 million anti-microbial are prescribed yearly (Hick *et al*., 2011). This ponders looked to quantitate the rate of superfluous anti-microbial prescriptions for dermatological conditions by non-dermatologists and characterize the patient, provider, and pathogenic factors that impact these empiric treatments. We found that 15% of patients had been prescribed anti-microbial for a bacterial cause, most commonly within the setting of hones found in regions with less get to specialist and with illness processes which may imitate bacterial infection. These conditions incorporate eczematous conditions arthropod ambush, herpes zoster, neurodermatoses, autoimmune blistering disorders, and neutrophilic dermatoses. Although these discoveries are not without modest limitations, they serve to direct advance examinations as well as educational outreach efforts (Haynes *et al*., 2018).

The prescribing of anti-microbial in essential care increased steadily around the world during the last decade (Kontarakis *et al*., 2011). Self-medication with anti-microbial isn't allowed in South Africa. Antimicrobials in South Africa are as they were accessible on prescription (Rossiter, 2016). Approximately half of the respondents were of the supposition that they are not qualified to prescribe anti-microbial, but that with further, training, they ought to be in a position to relieve the pressure on therapeutic practitioners in diagnosing and treating minor conditions that require anti-microbial treatment. Drug specialists can play an important role in educating patients some time recently they seek for therapeutic care of a therapeutic practitioner and can act as gatekeepers to refer patients with more serious infections. This may help in containing costs in that the discussion fees paid by patients who seek for anti-

microbial for minor improper conditions will be avoided. The challenge will be to break the cycle and to persuade patients to first consult their drug specialist for minor conditions. The introduction and utilize of anti-microbial guidelines amid at drug specialists, and protocol-based prescribing in a multidisciplinary group hone with infection illness specialists may moreover increment pharmacists' information and prescribing of anti-microbial. The little sample size may be limitation of this study about, and thus the ponder can only regarded as a hypothesis producing preliminary examination, based on which a bigger across the country ponder can be conducted. Although the results about of this think about cannot be generalised, the discoveries do provide insight into how drug specialists perceive anti-microbial prescribing and utilize in a period where anti-microbial resistance is genuine (Truter *et al*., 2017).

Taking into consideration the significance of anti-microbial utilizes, among the community, it is additionally important to explore anti-microbial self-medication (ASM). This practice more often than not presents within the form of utilizing leftover anti-microbial, and utilizing anti-microbial for non-indicated conditions (Shehadeh *et al*., 2016). A substantial proportion of dental patients in Al-Madinah, western Saudi Arabia, self-medicate with anti-microbial for the treatment of oral illness, and these hones gets to be more prevalent with age. The patients, primarily get drugs from drug specialists, and numerous of them need information on the type of anti-microbial and appropriate clinical indications. Mediations from official institutions like ministry of health are required; these oughts to target both drug specialists and patients. It is time to control the medications dispensing by drug stores and to enforce legislation, which considers anti-microbial" prescription", and not "over-the-counter" medicines. Educational programs targeting on patients ought to address the significance of occasional dental attendance and preventive dental services. These programs ought to too teach the public about the numerous dangers of anti-microbial abuse especially those related to anti-microbial resistance. It may moreover be useful to establish more emergency dental clinics affiliated to the ministry of health to provide emergency services for patients who complain of acute dental pain. This ought to go hand in hand with progressing get to and encouraging the arrangement of oral healthcare services to those in pain in an exertion to eliminating patients require for getting the drugs that they look for to reduce their dental pain (Dar-Odeh *et al*., 2018)

A major issue with self-medication with anti-microbial is the emergence of drug resistance. Antimicrobial resistant is a current issue around the world, especially in developing nations

(WHO Global strategy for containment of anti-microbial resistance, 2001). It is broadly believed that human malpractice, such as insufficient dosing, inadequate courses, and aimless drug utilize have contributed to the emergence and spread of anti-microbial resistance (Saradamma *et al*., 2000). The result of anti-microbial resistance is the misfortune of generally cheap drugs that will require the modern drug development, which will be more costly. Consequently, the rationale utilizes of anti-microbial is of great significance to limit the increment in bacterial resistance. Our study shows the wide accessibility of anti-microbes over the counter and reveals the high prevalence of self-medication with anti-microbial in spite of Yemen's anti-microbial policy that restricts their dispensing without prescriptions. Amoxicillin was the foremost commonly chosen anti-microbial for self-medication and this result is in agreement with reported results about from studies in Sudan (23%), Jordan (53.56%) Greece, and Emirates (46.6%) (3Awad *et al*., 2005; Al-Azzam *et al*., 2007; Abasaeed *et al*., 2009). Other anti-microbes that were utilized to include Ampicillin, Tetracyclines, and Cefadroxil. The high prevalence of self-medication in this study can be explained by the ease with which anti-microbes can be gotten from the community drug stores, which in turn reflects the lack for a high disciplinary regulation. Ponder results about uncovering that the prevalence of self-medication with anti-microbial within the community in the Mukalla area is high. With these results about, it is believed that wellbeing policy makers ought to execute wellbeing mindfulness programs to prevent anti-microbial misuse and assist strengthen the legislation of administering a sale of prescription drugs without prescription. Given the growth worldwide resistance to anti-microbial and the documented wellbeing issues related to improper utilize of such drugs, our results could have major public wellbeing implications for nations like Yemen (ALFADLY *et al*., 2016).

The self-medication market, which amounted to 7.6% of the worldwide pharmaceutical market in France in 2012 (11.2% in Germany, 12.3% within the joined together Kingdom and 14% in Belgium) is now on the rise (+3.2% in 2012) (Ministry of the social affairs, 2015). Self-medication can first with of all be imagined resorting one or more drugs without the assistance of a doctor (Montastruc *et al*., 1997; Sailer *et al*., 22012). The primary reasons for choosing self-medication are well known. For an patient, it can be due to the following; trouble in getting an appointment with a doctor, unfavourable monetary circumstance, simple get into drugs, the conviction that the pathology is of secondary significance, the feeling of having been through similar symptoms that he/she knows how to treat, the fear of being told that it may be a serious sickness, a fear that does not, in any case, undermine the patient's

wish to treat him/herself (Montastruc *et al*., 1997; Giroud *et al*., 2011; Fainzang *et al*., 2012; Fainzang, 2013). Whereas various articles broadly discuss about the threats of self-medication in common, it is shocking to see that few published surveys and ponders give truthful information on the adverse effects of self-medication, its characteristics, the characteristics of the patients involved and the medicines implicated. It is genuine that there are limited perceptions depicting a specific case or a little number of cases, but there's a small, systematic prospective work of the pharmaco-epidemiological type (Montastruc *et al*., 2015).

Self-medication involves the utilize of therapeutic products by the consumers to treat self-recognized disorders or symptoms, or the discontinuous or continued to utilize prescribed by a doctor for chronic or recurring diseases or symptoms. In hone, it too incorporates utilize of the medication of family individuals, particularly where the treatment of children or the elderly is involved (Guidelines for the regulatory assessment of medicinal products for use in self-medication). Utilize of self-medication is highly prevalent in both urban and rural community varying from 32.5% to 81.5% (Lam *et al*., 1994; Sanghani *et al*., 2008; Phalke *et al*., 2006). To conclude, there is the high prevalence of self-medication in the elderly, although Allopathic medicine is most as often as a frequently choice, home remedies, and other complementary and alternative drugs are moreover utilized. The larger part of the elderly utilizes them for minor sickness. In any case, self-medication may lead to unwanted results due to interaction with the prescribed drug treatment for chronic maladies. Information on the portion of doctors as well as patients about self-medication hones would offer assistance in decreasing the chances of any untoward consequences (Parmar *et al*., 2015).

The World Health organization characterizes self-care as "the capacity of people, families, and communities to promote wellbeing, prevent malady, and keep up wellbeing and to manage with ailment and inability with or without the support of a health care provider (WHO regional office in South-East Asia, 2015). Drug store has a long history of encouraging self-care, but new more than ever before drug specialists and their staff is being given opportunity to extend their contribution. However considerable obstructions still exist on the off chance that community drug store is to maximize its potential. From inside the profession, questions ought to be inquired about pharmacists' capacity and readiness to embrace alter. From other wellbeing care providers, the issue is one of hesitance to permit the drug store to require on the greater obligation. New health care pathways giving a simpler

transition through the self-care continuum that brings the customer, drug specialist, and essential medical services together are needed (Rutter, 2015).

Antimicrobial resistance can be characterized as the capacity of a microorganism to survive and resist to a exposure to anti-microbial drugs, threatening the effectiveness of successful treatment of infection. Resistance can be exchanged hereditarily from one microorganism to another. Antibiotic resistance could be a recognized public wellbeing issue in the local, national and worldwide levels. Currently, anti-microbial resistance is a concern because it is not an indicator of maintaining up wellbeing inside populaces but an expanding threat to future of wellbeing as anti-microbes are being misused (WHO the anti-microbial resistance. Global report on surveillance, 2014; Nordberg *et al*., 2004). The discoveries illustrate that respondents have several misinterpretations and a lack for mindfulness on anti-microbial utilize and resistance. Further qualitative and quantitative studies are required to identify the determinants of attitudes, behaviour, desire and inspiration that lead individuals to utilize and misuse anti-microbial. Considering the complexity of infections illness and anti-microbial resistance administration within the worldwide healthcare field, the Georgian government ought to commit to investing to public wellbeing education programs for the public and health care experts. In addition, the government ought to require is a health care framework to develop proper regulations and prescription policies as well as controls for prescription drugs and enable the pharmacists' role in raising mindfulness around the utilize of anti-microbial and the growing anti-microbial resistance inside populaces. At long last, public wellbeing strategies- including educational programs ought to be develop, targeting on specific regions of misinterpretation, misuse of anti-microbial, and identification of at-risk populaces in terms of inappropriate anti-microbial consumption (Kandelaki *et al*., 2015).

On the 14th of August, 1997, Pakistan celebrated its 50th anniversary of gaining freedom. The show populace is 130 million individuals. The pharmaceutical industry started from a scratch and presently has a large drug market of 650 million dollars. The development of the pharmaceutical manufactures has gone up to 275 out of which 31are multinational companies who earn 70% of the profit. There are at slightest 1,200 pharmaceutical items enlisted in Pakistan. The Pakistan drug Act of 1976 is now 28 years old and it requires carrying out of clinical trials on new drugs prior enlistment in Pakistan. In fact that based on the reality that no skill exists in clinical pharmacology within the whole nation, meaning the scholarly community, pharmaceutical industry and governmental institutions that give and manage drug supplies (Khan, 2005). In this ponder, we discover out that a huge number of drugs are

being utilized in wrong way. Drug hones within the tertiary care hospital was mainly irrational and was potentially exposing the life of patients to the persistent risk during treatment period. The current paper highlighted that the quality of services given by community pharmacies in Pakistan isn't satisfactory. Absence of qualified individuals, the lack of provision of exhortation and lack of polished skill by the dispensers, ambiguity of laws and their usage are the most reasons for the poor quality of services offered in community drug stores. This all leads to irrational utilize. There's a solid ought to utilize the vital portion i.e. Community drug stores which acts as a first-line treatment source for most of the populace. The techniques will be formed utilize their potential in a promoting rationale drug utilize in line with the experience of other developing nations. Policy investment is required in the regulation of drugs to diminish superfluous proliferation and prescribing, and fortifying quality parameters at provider and community drug stores. WHO's suggested fundamental Drugs ought to be made accessible everywhere and at all times. The government ought to make each try to promote the utilization of fundamental Drugs in both the public and the private segments. It is recommended that government wellbeing facilities and government must do better to eliminate with that extreme condition and follow WHO protocols to guarantee judicious utilize of drugs in Pakistan (Arshad *et al*., 2016)

Knowledge, attitude, and practice about antibiotic medicines

Antibiotic is a chemical substance that kills or slow down the growth of micro-organisms (Clardy *et al*., 2009). In 2011, WHO set the subject of the world health day as "combat antibiotic resistance: no activity nowadays, no remedy tomorrow". The WHO in 2012, has emphasized the significance of the level headed endorsing within the undergrad restorative educational programs. This appears a genuine and worldwide issue of antibiotic abuse and there's a developing agreement to direly create modern techniques for the anticipation of resistance of microbes to antibiotics (Andre *et al*., 2010). In later a long time, an increasing the number of investigators has focused their attention on antibiotic misuse, and take after with interest the knowledge, attitude and practice (KAP) towards antibiotics utilized by the public (You *et al*., 2008). Medical students are a future specialist for any society and they are the essential partners in any health care system. Hence, their convictions and hones to antibiotic endorsing will affect antibiotic resistance. This was a survey-based cross-sectional think about conducted among 162 restorative students amid MAY 2016 TO JUNE 2016 at a tertiary care, instructing clinic taking after endorsement from the organization's morals

committee. A questionnaire was utilized to survey knowledge, attitudes, and practice of antibiotic utilization among 2nd-year therapy students. The display ponders on antibiotic utilization gives valuable data almost the information, demeanours and the homes of second year medical students, which may be utilized to arrange reasonable instructive interventions/small bunch works at that point of moving forward the productive antibiotic endorsing, legitimate utilize by the patients in arrange to play down the improvement of drug resistance (Padmanabha *et al*., 2016).

In expansion to that, antibiotic resistance is taking a huge toll on the community as well as the health care system. Besides, it has been dependable for at slightest 23,000 passing and amazing two million cases of antibiotic resistance ailments within the joined together states of America (USA) each year. Moreover, the centres for disease control and prevention (CDC) evaluated the financial impact of antibiotic resistance within the USA alone to be roughly US $35 billion per year, partitioned as $ 20 billion coming about from coordination wellbeing care costs and as much as $15 billion to the open due to the misfortune of productivity (Roberts *et al*., 2009). Besides, concurring to the world health organization's territorial office for Europe, there were an assessed 25,000 passing as well as 400,000 patients displaying safe strains amid 2007; where the financial burden totalled at euro1.5 annually. Thus, in an attempt to direct the improvement of modern antibiotics, the WHO has discharged its, to begin with ever need a list of 12 antibiotic resistances microscopic organisms on February 27th, 2017; clearly depicting the worldwide energy this issue has picked up. This is thought about uncovering that patients frequently have insufficient information almost antibiotic utilize, which influences their attitude and practice. In this way, teaching patients may decrease pointless antibiotic utilize and resistance within the community (Alkhuzaei *et al*., 2017).

Antibiotic resistance could be a critical risk to the open wellbeing that increments the costs of health care, with lengthier remain in hospitals and more seriously cares required. Numerous studies have recognized that unsuitable and disproportionate use of anti-microbial are the major cause of the development and choice of tough bacteria (Elias *et al*., 2017). Various ponders have been carried out to evaluate the common population's information almost antibiotics and antibiotic resistance (Gualano *et al*., 2015), highlighting divided and erroneous data. To overcome this need of information, a few European nations (Mazinska *et al*., 2017; Formoso *et al*., 2013), as well as the joined together states (Gonzales *et al*., 2008) have launched public awareness campaigns almost appropriate antibiotic utilize. In this

setting, the web and social media can be valuable health promotion tools, since they give imperative communication opportunities among people, companies, and organizations additionally reduce the effect of conventional boundaries of communication such as organizational hierarchy or financial status. This cross-sectional think about was conducted from Walk in May 2017, among a test of 1355 guardians of public schools' students within the geographic area of Catanzaro, within the south of Italy. In conclusion, web and social media are broadly utilized for antibiotic-related data looking for within the Italian populace. Health organizations must consider social media insider their communication techniques to advance the fitting web utilize for antibiotic-related information looking for within the common populace, although more proof is required concerning the optimal mix of communication mediations (Zucco *et al*., 2017).

Antimicrobial resistance is a worldwide community health worry (WHO, 2014). Resistance microbes are allied with bigger morbidity, mortality, and socioeconomic costs (WHO, 2014: Thabit *et al*., 2015), with the growth of resistance related to the overuse of anti-microbial (Thabit *et al*., 2015; Costelloe *et al*., 2010). Upper respiratory tract infections (URTIs) are the greatest common disorder seen in principal maintenance settings in Singapore (Sng QS. 2011) and maybe the main source of anti-microbial overuse (Tan *et al*., 2006). We think about finding that mediation for decreasing antibiotic medicines in Singapore's essential wellbeing care setting may, as it was having been compelling in a little subset of patients. In spite of the fact that patients within the intercession arm detailed a made strides understanding of URTI causes, the mediation was related to reduced antibiotic prescriptions and expanded mindfulness approximately the appropriate utilize of antibiotics for URTIs and the side effects of antibiotics within the Indian ethnic subgroup as it were, and follow-up studies about to explore contrasts in reactions to instructive programs between ethnic bunches might encourage the plan of more focused on patient-level intercessions (Lee *et al*., 2017).

Antimicrobial resistance is a thoughtful and rising problem, caused in the portion via overuse and misuse of anti-microbial (WHO, 2001). There is significant evidence of sub-optimal utilize of anti-microbial in the public. This includes recommending and utilize for inappropriate situations, and utilize of insufficient care courses and sub-therapeutic doses (Arroll *et al*., 2005; Del Mar, *et al*., 1998). One of the contributing issues is the inappropriate recommending of anti-microbial for non-specific upper respiratory tract infections (URTIs) (Del Mar, *et al*., 1998; Cals *et al*., 2007; Wong *et al*., 2006). For our information, typically as of now the biggest Australian ponder investigating consumers' information and desires for

antibiotics when showing with a URTI. This is considered has distinguished a few key inspirations for why patients expect antibiotics and their need for understanding of individual results of antibiotic resistance that have not been addressed to by recent open wellbeing campaigns. A few misinterpretations among patients and their understanding of why GPs do or don't prescribe antibiotics show a critical ought to bridge the communication gap. Essential care doctors will be prepared to develop way better communication procedures for managing with patients. There's a pressing requirement for the central message of future open wellbeing campaigns to be centred on the individual results of taking antibiotics improperly and the suggestions of antibiotic resistance in the common open. The key message ought to centre on the immediate and desperate repercussions of antibiotic resistance for people and their families within the brief term (Gaarslev *et al*., 2016).

In spite of these successes, small is known approximately the common population's infection-related wellbeing knowledge (Burnett *et al*., 2013). The accessible information demonstrates that patients' information approximately URTI is simple (Dun-Navarra *et al*., 2012; Yu *et al*., 2014). Little levels of infection-related wellbeing, education relates to expanded utilization, counting improper self-medication with antibiotics (Yu *et al*., 2014). Moved forward understanding approximately how patients own experiences inform their understanding of the real dangers and benefits of antibiotic treatment for viral URTI may give experiences into how to most successfully increment URTI-related wellbeing knowledge. The Auckland city's healing centre may be an expansive tertiary care, healing centre found within the middle of NZ's biggest city. It gives government-financed auxiliary care to roughly 464,000 of Auckland's 1, 42 million inhabitants. The nearly all-inclusive conviction that antibiotics are secure, advantageous solutions, indeed among individuals with earlier an ADR, makes a difference to clarify the solid persistent desire for antibiotic treatment in an extends of conditions. Instructive campaigns around the medicine of antibiotics for viral URTI ought to incorporate data that the chance has hurt distant exceeds any potential benefits (Ritchie *et al*. 2017).

Within the paediatric populace, the non-prescription use of antibiotics can be more tricky and requires specific concern. To begin with, children are subject to tall rates of antibiotics utilize (Nash *et al*., 2002), and most of the drugs are utilized in outpatient care to treat contaminations with viral root (Dyar *et al*., 20016), which leads to tall rates of superfluous antibiotic utilize. Moment, children are at a higher chance of medical mistakes (WHO, 2007). Third, a few antibiotic-resistant pathogens with fast increments are driving causes of

versatility and mortality in children, such as streptococcus pneumonia (Okeke *et al*., 2005). As of late, winning non-prescription utilize of antibiotics children in china has been highlighted by analysts as a pressing open wellbeing issue to address (Fang *et al*., 2014: Kan *et al*., 2016). Knowledge, demeanours, and hones concerning antibiotics utilize in children were surveyed through a cross-sectional survey overview of 4200 caregivers of children under-7 years a long time from three cities in China. Information was analysed utilizing graphic insights and multivariate analysis. There was a tall extension of essential caregivers self-medicate antibiotics for children in urban china, in spite of their deficient information almost antibiotic utilize. Open wellbeing activities are required, such as open instruction campaigns and stricter government direction of antibiotic utilize and accessibility in community pharmacies (Chang *et al*., 2018).

Chapter # 3

Research methodology

3.1 Method and Approach

The nature of the study provides the basic reason for picking research methodology among quantitative and qualitative techniques. A qualitative approach to research is most appropriate for this study seeing the exploratory nature of phenomena and few existing studies is founded about.

3.2 Data collection

The data collection method for this exploratory study is semi-structured interviews, the interviewees are selected from Rawalpindi and Islamabad of different ages as a user of antibiotics.

The interviewees included 6 adults who used themselves, 3 interviewees are 50 years older, 3 interviewees are parents, including 2 fathers and 1 mother and a total of 12 interviews are conducted by face to face meetings.

3.3 Conducting the interview

The researcher used semi-structured interviews for this study. These semi-structured interviews cover a wide range of perceptions. It refers to a context in which the researcher asks a series of questions to the interviewee in general. The questions are mostly related to antibiotic usage and capture the perceptions regarding the use of generic antibiotic, the interviewers have the latitude to ask questions in response to what is seen as important replies.

3.4 Data analysis

The commonest form of analysis in qualitative research is the thematic analysis that includes patterns, recording with the help of data. Themes depict patterns of data that describes the phenomenon related to research objective or questions. The themes of this qualitative research are developed after the interviews; in the next chapter, we present a comprehensive summary.

Operational Definitions:

Antibiotic

Antibiotic is a chemical substance that kills or slow down the growth of micro-organisms (Clardy *et al*., 2009).

Antibiotic Resistance

Antibiotic resistance is a condition when microscopic organism, alter against antibiotic which are created to cure the illness, they cause (“Antibiotic Resistance,”http//www.WHO.int/News).

Consumer perception about antibiotic resistance

Consumers’ perception of medicine refers to patients’ view of medicines results and are monitored to assess the delivery and quality of medicines (WHO, 2000). Whereas antibiotic resistance is a condition when microscopic organism, alters against antibiotic which

are created to cure the illness, they cause ("Antibiotic Resistance,"http//www.WHO.int/News).

Antibiotic resistance VS antibiotic excessive use

Antibiotic resistance is a state when microscopic organism, alters in ways that empower them to resist the impacts of antibiotics, to which they previously succumbed (What is antibiotic resistance, 2017). Each dose of antibiotic utilized increments the like hood of antibiotic resistance (Phelps, 1989).

Excessive use of antibiotics is defined in European study where misuse was seen by patients, who exert unnecessary pressure on doctors to get prescription of antibiotics by exaggerating symptoms, by non-bacterial infections (e.g. Flue, cough, sore throat, etc.) and one of their motives is to save some medication for future use (Austin, D. J., Kristinsson, K. G., & Anderson, R. M. 1999; Grob, P. R. 1992).

Patient Perceptions of Generic Medicines

Patients' perception of medicine refers to patients' view of medicines results and are monitored to assess the delivery and quality of healthcare (WHO, 2000).

Patient compliance and awareness

Compliance is defined as "the extent to which the patient's behaviour matches the prescriber's recommendations" (Horne *et al.*, 2005).

Patient self-Medication regarding antibiotics

Self-medication refers to the utilize of medications to treat self-diagnosed disarranges without counselling a therapeutic practitioner and without any medical supervision (WHO Guidelines for the regulatory assessment of medicinal products for use in self-medication, 2015).

Knowledge, attitude, and practice about antibiotic medicines

Antibiotic is a chemical substance that kills or slow down the growth of micro-organisms (Clardy *et al*., 2009). In 2011, WHO set the subject of the world health day as "combat antibiotic resistance: no activity nowadays, no remedy tomorrow". The WHO in 2012, has emphasized the significance of the level headed endorsing within the undergrad restorative educational programs. This appears a genuine and worldwide issue of antibiotic abuse and there's a developing agreement to direly create modern techniques for the anticipation of resistance of microbes to antibiotics (Andre *et al*., 2010).

Reliabilities and triangulation

Interviews were audio recorded as consumers were not willing for the video recording. Further, notes of their attitudes were also taken. Most of the consumers seemed serious while responding and took ample time to think and respond accordingly. At an average one interview took more than ninety minutes.

The researcher tried to triangulate by using sample triangulation method and incorporating Doctors' point of view. Doctors have direct interaction with consumers so they are in good position of describing the consumers approach toward antibiotics use. However, none of the doctors that we contacted agreed to respond hence we were unable to triangulate the findings. Further, lack of time and resources didn't allow to move to different locations or increase the sample, or even conduct study at different time intervals. This could have provided some bases for triangulation but as a student it seemed beyond capacity.

Sami-structured questionnaires guide

Current research is a qualitative study in which perceptions of patients are captured regarding the usage of antibiotics in Pakistan and why patients perceive antibiotics as the best treatment for infections? For this purpose, interview with students & faculty of universities conducted from 4 provinces of Pakistan and Islamabad. We categorized respondents in 3 categories,

those are working adults, aged 18–54 years; adults over 55 years; and mothers of children aged 0–12 years (Pechere, 2001). Nvivo will be used for this qualitative research.

Semi-structured, open-ended interviews were conducted to extract maximum knowledge/information from respondents.

Patient's interview questionnaire

Do you know what antibiotic medicine is?

Have you ever used antibiotic medicinally?

How frequently you use antibiotics?

After how many days of infection (s) you visit the doctor?

Before that what you use to do to get rid of infection?

How do you decide that now it's time to consult a doctor for the treatment of infection?

Have you ever visited the doctor more than once to get treatment of 1 infection?

What were those infections where you need to visit a doctor more than once to get treatment of 1 infection?

1. _____
2. _____
3. _____
4. _____
5. _____

What were the reasons that you need more than 1 antibiotic treatment to treat 1 infection?

1. _____
2. _____
3. _____
4. _____
5. _____

Have you ever changed your doctor for the treatment of infection, if you could feel better? If no, reason? If yes, reason? And how many days you use treatment of a doctor?

Have you ever insisted a doctor to prescribe you antibiotic(s)?

In your opinion, what are the appropriate usages of antibiotic(s)?

Do you know the side effects of antibiotics and its hazards of excessive use?

Do you feel that antibiotic(s) are as effective as these were in the past? If yes or no, reason?

Have you ever studied the antibiotics, which were prescribed by your doctor? If no, reason? If yes, what was the source? What was your finding? What was your action?

Have you ever felt that doctor prescribed you unnecessary antibiotic? If no, how you felt that? If yes, how you felt that? What was your action?

Have you ever used antibiotics without a prescription? If no, reason? If yes, which infection was that? Which antibiotic you used, for how many days and dosage per day? How frequent you are using this?

Have you ever suggested an antibiotic (s) to any person in your circle? If no, reason? If yes, which infection was that? Which antibiotic you suggested, for how many days and dosage per day? How frequent you are suggesting this?

Have you ever used a non-medicinal treatment for the infection? If no, reason? If yes, what was that? What are those infections? And how many times you succeed?

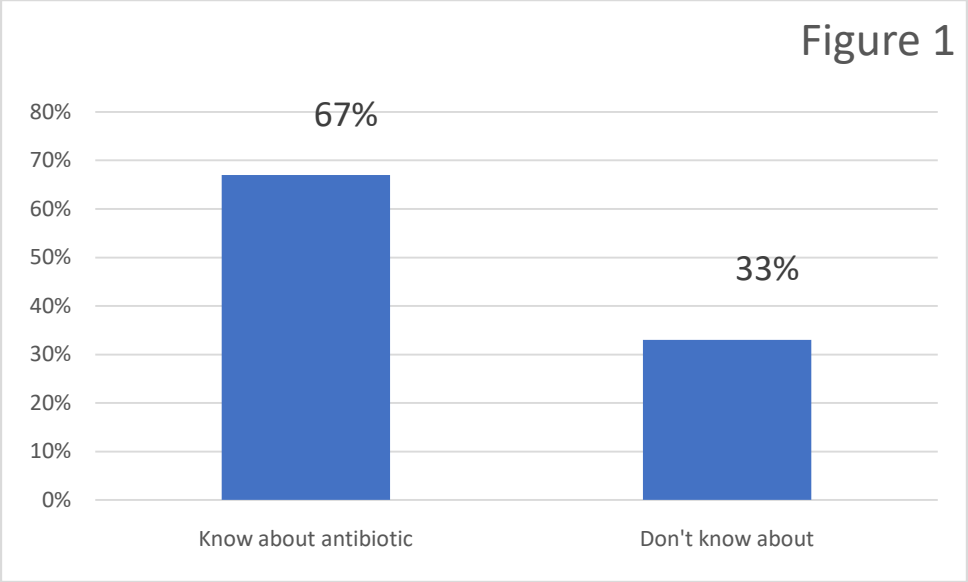
Have you ever used precautions for not getting infected? If no, reason? If yes, what was that? What are those precautions? And how many times you succeed?

Chapter # 4

Results and Discussion

In this section, we analysed the consumer's perceptions regarding generic antibiotics and explored their level of awareness, perception about the prescription of antibiotics and self-medication.

Consumers' awareness about antibiotics



Results showed that 8 out of 12 respondents heard about antibiotics (67%) and 4 respondents don't know (33%) mention in figure 1. Even those who have heard about antibiotics, they just heard about this word "antibiotic" without any detail e.g. which type of infection is suitable for antibiotics and why doctors recommended these medications to patients.

Almost 33% of respondents know about the name of Augmentin (antibiotic of GSK), 25% of respondents know about the name of Amoxil (antibiotic of GSK) and approximately 17% of respondents know about the name of Kalaracid (antibiotic of Abbott) and Erythrocin (antibiotic of Abbott). 8% of respondents don't know about the name of any antibiotic medicine. Almost 33% of respondents know the name of just 2 companies (GSK & Abbott) which manufacture antibiotics.

The youngest age group (26-35) is more aware of antibiotics compared to patients who are 50 or older. Similarly, graduates or master degree holders are more aware compared to undergraduates. Sources of information on the majority of respondents are pharmacists, newspapers, and doctors.

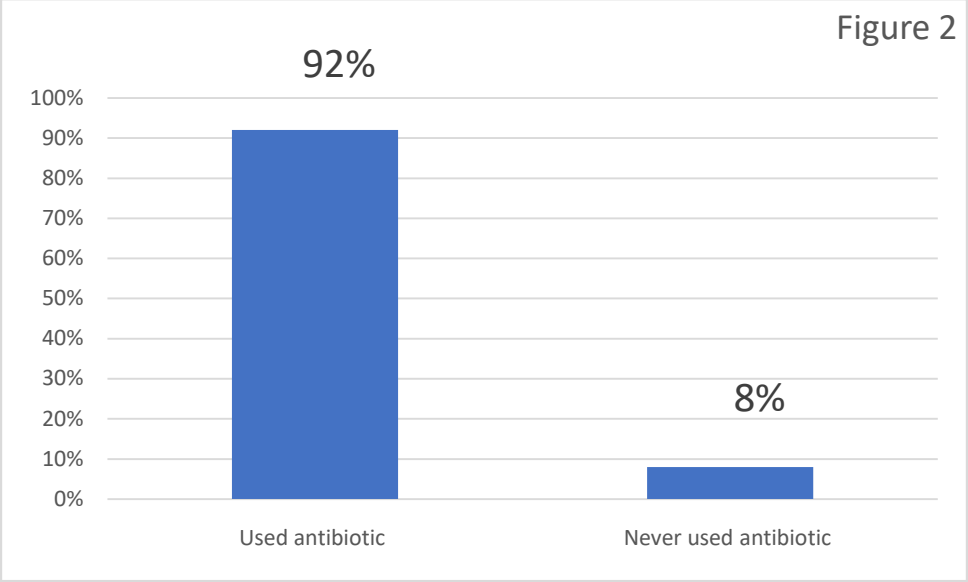


Figure 2 shows that only 8% of respondents said that they have never used antibiotic medicine and 92% of respondents said that they have used antibiotic medicine.

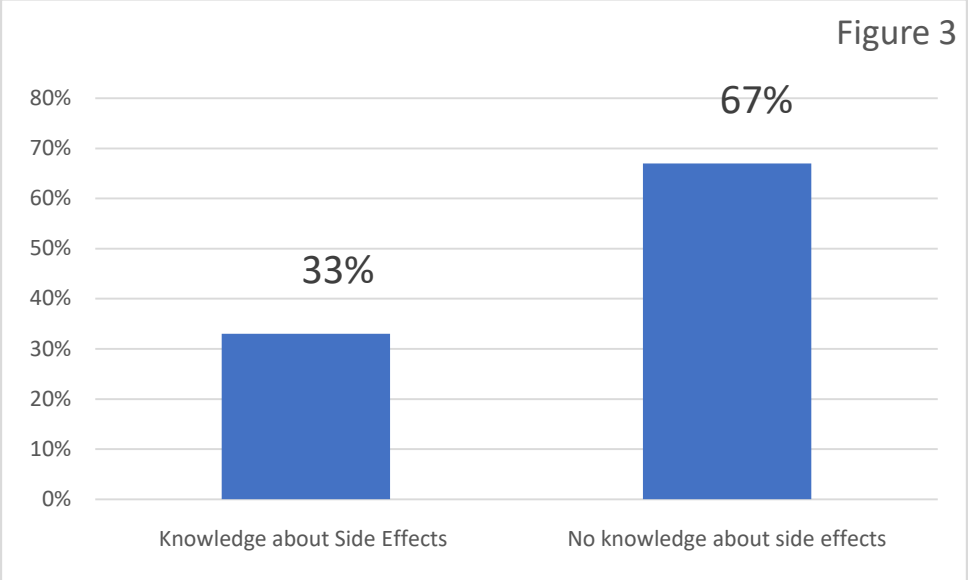


Figure 3 shows that most respondents don't know knowledge about side effects and some respondents know about based on experience e.g. Antibiotic effects kidneys, abdomen, and bacterial resistance.

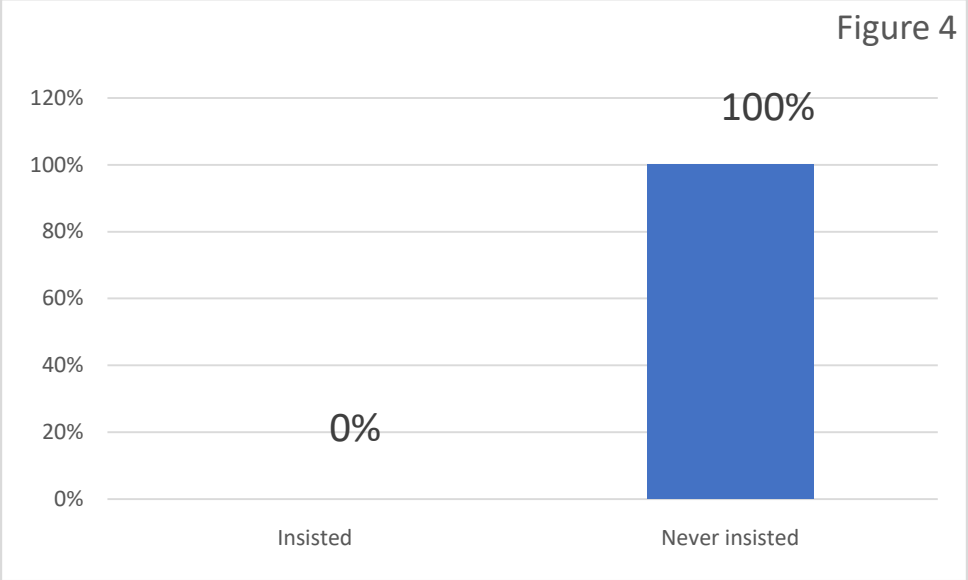


Figure 4 shows that patients have never insisted doctors to prescribe an antibiotic, but high expectations of the patient are the major cause of prescribing an antibiotic in 1st visit. Otherwise, the doctor feels the threat of losing a patient if not get better within 2 days of 1st visit.

Respondents emphases that antibiotics must be used according to doctor recommendations and follow his/her instructions regarding the complete duration of treatment curse e.g. 3, 5, 7 days or longer duration of treatment may be followed according to infection severity.

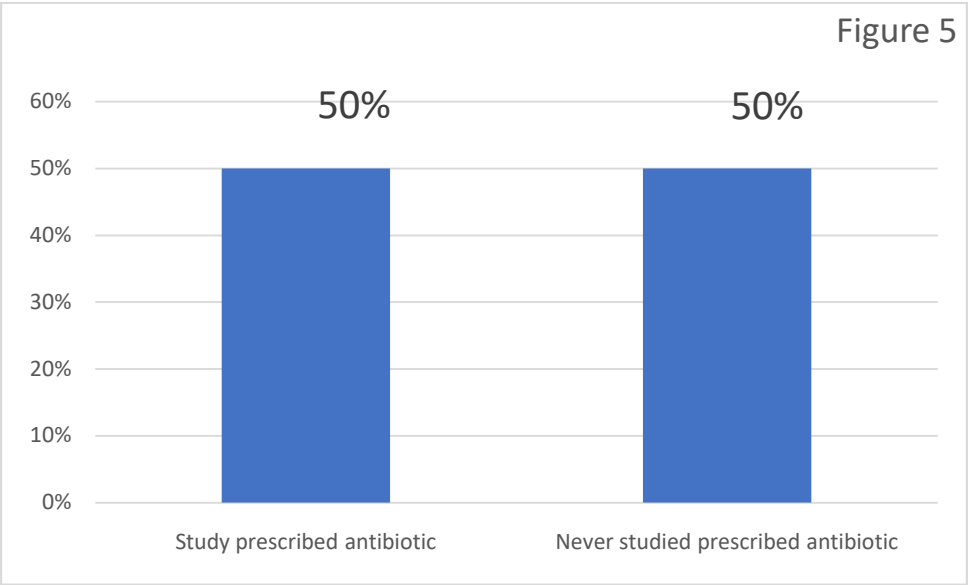


Figure 5 shows that 50% of patients don't study the prescribed medicine and similarly 50% patient study. Major reasons for not studying prescribed medicine are the lack of free time, difficult medical terminologies and over trust on doctors that whatever is prescribed by a doctor is authentic.

Major sources of studying medicine are the internet and leaflets. Side effects and dosage are the most studied part.

Patient's perception about the prescription of antibiotic(s)

The majority of the respondent decides to visit their doctor for treatment of infection when it gets severed e.g. Temperature, pain and difficulty in following routine life. However, some respondents don't visit to the doctor.

Almost 58% of respondents visit their doctor within 3 days, 17% of respondents visit their doctor for 4-5 days, 17% of respondents visit their doctor the same day and 17% of respondents don't visit their doctor for any infection.

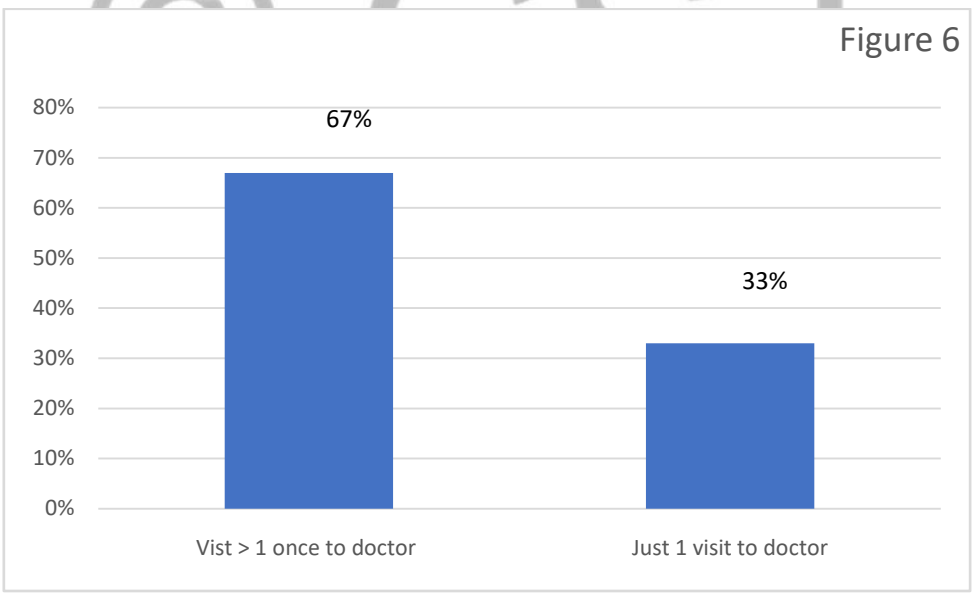


Figure 6 shows that more than 2/3 respondents don't get accurate treatment in the first visit that's why they visit again and again. Approximately 2/3 respondents visit their doctor for upper respiratory tract infections e.g. throat infection, sinusitis. On the other hand, few respondents visit their doctor for specialized diseases e.g. kidney disease or they don't prefer to visit a doctor.

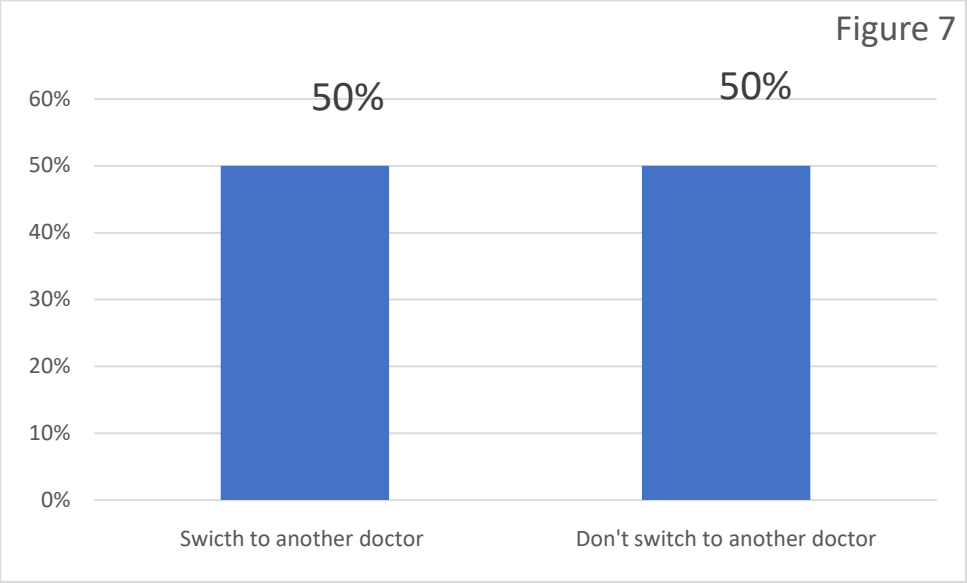


Figure 7 shows that more than 50% of patients switch their doctor if they don't feel better. 6 out of 8 patients switch their doctor if they don't feel better within 2 days of 1st visit, in other words, more than 75% patient switch their doctor if they don't feel better within 2 days of 1st visit. This data shows that accurate diagnosis of the doctor and fair prescription of treatment is very important for a walk-in patient in the 1st visit, otherwise these patients will not only switch the doctor but will never recommend to anyone. Only 25% chances that 1st visitors will come back again and mostly these are the patients of family doctors.

Few examples exist in our society when patients use to recommend doctors in their circle by saying "I get better by using a single dose of medicine prescribed by my doctor" or "I get better within 1 day by using medicine prescribed by my doctor". These practices have two aspects, might be a doctor has rightly diagnosed the infection and prescribed the best treatment or doctor use to prescribe aggressive treatment for every type of infection. The second aspect is most prevalent in our society and that's also a major reason for the excessive usage of high-grade antibiotics. This aspect also leads to antibiotic resistance because low-grade antibiotics will not be effective for those particular patients if relapsed within a short time.

Aggressive treatment is also an important tool for these doctors for patient retention otherwise his/her patients will never recommend him/her to anyone by saying “I get better by

using a single dose of medicine prescribed by my doctor" or "I get better within 1 day by using medicine prescribed by my doctor" and will never come again.

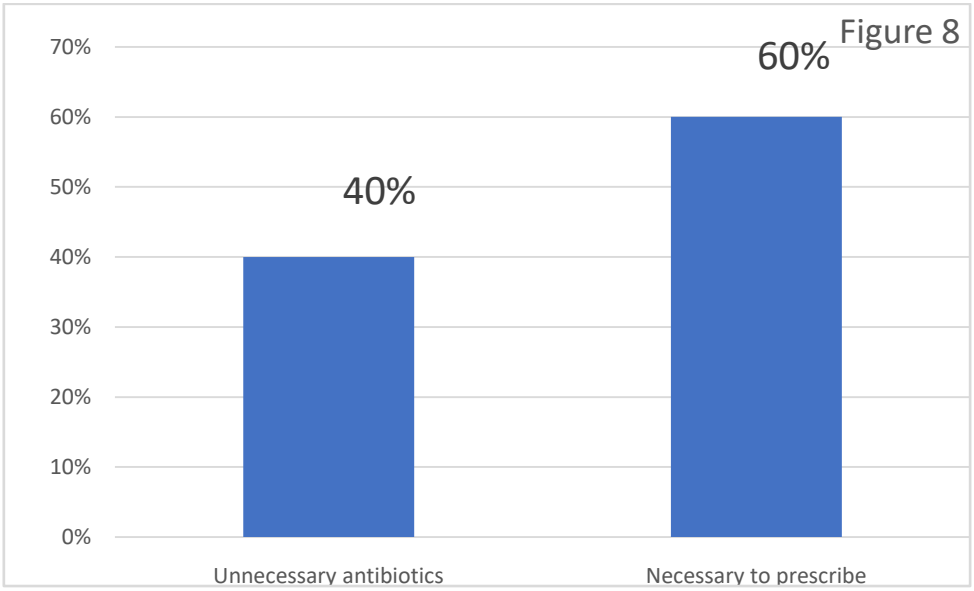


Figure 8 shows that nearly 40% of patients feel that their doctor has prescribed unnecessary antibiotics, according to this group of patients feel that either infection can be treated without antibiotics or it can be treated with low-grade antibiotics.

Self-medication by patients

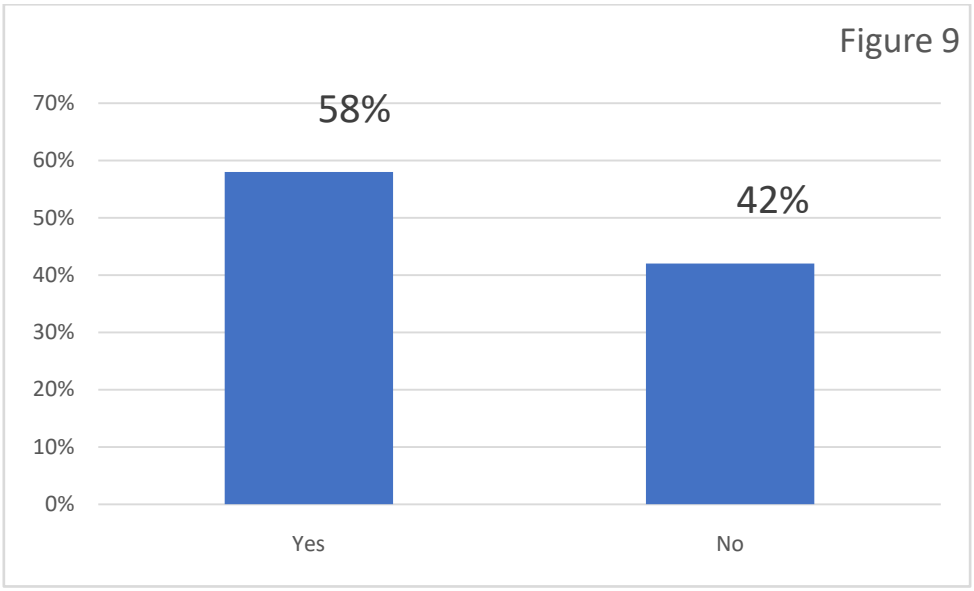


Figure 9 shows that more than half of the respondents practice self-medication. Some of these patients use an old prescription of the same disease, some consults with chemists. Even some patients alter the therapy duration and dosage by themselves. Major infections were sore throat and sinusitis.

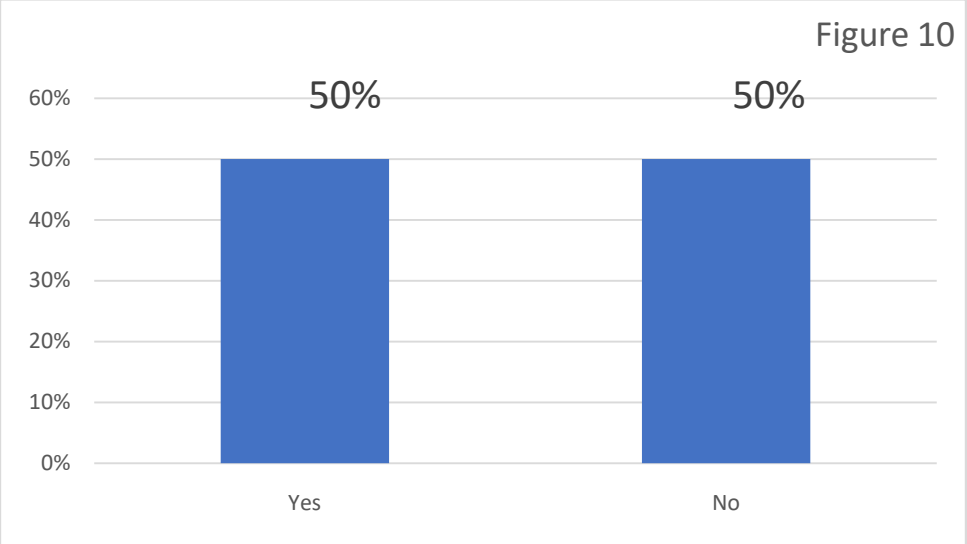


Figure 10 shows that interestingly, half of the patients suggests critical medicines like antibiotics e.g. Levofloxacin, Lincocin, etc. It's very alarming that in our society patients not only practice self-medication, but also recommend antibiotics to other people. Mostly, patients recommend those medicines which they used in the past and got relief and after that, they start recommending same medicine without having complete knowledge of antibiotics e.g. dosage according to weight, history of the patient, contraindications, side effects, precautions, age, gender, etc.

Those who don't recommend antibiotics to others, they feel it's bad to experiment on loved ones (e.g. Parents and children, etc.), don't like to pore nose to the doctors and fear of side effects, etc.

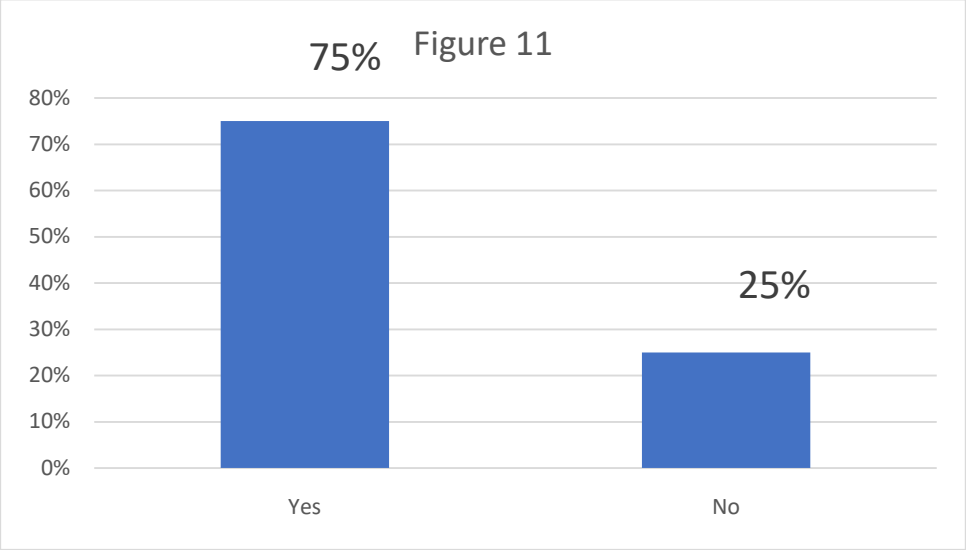


Figure 11

Figure 11 shows that more than 75% of users of medicine first try herbal, natural and/or food remedies. Even some people use a precautionary measure, especially when the weather is changing. Those who don't prefer these non-medicinal methods major reasons are time constraints, lengthy process, and hassle.

Discussion

This research identifies the gaps in knowledge about the antibiotic in Pakistan. i.e. The patient doesn't know about the research, medicine and generic medicine even don't recognize antibiotic in doctor prescription among the other medicine. Patients just know about the word multinational and local drugs and they don't have information regarding medicine usage, side effects, and contraindications. Patients don't know about branded medicine and non-branded medicine. Due to the majority of the middle class and lower-middle-class people in Pakistani society, peoples can't manage the knowledge of medicine and especially information about antibiotic medicine, which is in line with previous researches (Formoso *et al*., 2013). Poor socioeconomic conditions, illiteracy and technical terms in patient information leaflets of medicines are the main reasons for poor knowledge of medicines. Other reasons include the busiest of people in different professional fields, their busy work schedule, and social responsibilities. These people don't have general skills and time for the study of the doctor's prescription of medicine and why the doctor prescribed that particular medication brand.

It's a matter of basic right of patients that they have accurate information about drugs that they are going to the intake. Government bodies (e.g. DRAP) try to enforce legislations about

good manufacturing practices, but negligible legislations are made regarding the patient's right to information about medicines. Even sources which are available for the information of medicines that are not easy to understood (Gaarslev *et al*., 2016). There is a need for pictorial patient information leaflets so that the majority of the illiterate population can also have awareness about medicine.

Another source of information for the patient is the most reliable doctor, but they always have a shortage of time, so they can't fully elaborate the information of medicine which they have prescribed, though it's their responsibility. In Pakistan, most doctors don't bother to fully elaborate the drug in front of patients due to mainly two reasons. First is the feeling of supremacy among doctors. As doctors are among the most respected professionals in society, patients trust them and don't bother to ask about the information about the medicines and doctors take that trust for granted and don't try to educate the patient except the most prevailing side effects of prescribed medicines. Secondly, sometimes doctors get irritated when a piece of information-seeking patients asks for the understanding of medicine that develops a culture of fear of doctors among patients. That's why most patients avoid doctors to justify the prescribed medicines in front of them as compared to the west.

Second, comes the waiting area of clinics or hospitals, disease awareness is the most prevalent in this area which is also indicted previously (Thabit *et al*., 2015.). Patients are informed about the possible signs and symptoms about the target indications of the drug promoters. This awareness is available for educated patients in the form of brochures, charts, posters, and standing banners. Free disease assessment camps, audio & video messages for every type of patients whether they are educated or not. There is no awareness about the usage, side effects and other options available for the same disease in the waiting area of clinics or hospitals. Even there is no referral of the source of such information for the patient. The doctor may refer very few patients to the drug representative for the understanding of the usage of medicine, which mostly happens in specialized treatment e.g. insulin pens, hepatitis, cancer, etc.

Another most common and important source of information for the patient is the pharmacy. Pharmacy workers also have an influential position in our society. Firstly, to walk in a patient, they suggest those medicines which have greater profits for them. These walk-in patients are mostly sufferers of mild disease e.g. general pain, fever, cough, etc. and they don't want to consult doctors either due to affordability or shortage of time. Secondly,

pharmacy workers, sometimes change the prescription of illiterate patients (mostly without the consent of patients and doctors) with highly profitable medicine brands of the same molecule that may. This rate of prescription change is high in rural areas and low in urban areas. On the other hand, pharmacy workers change the prescription of educated patients (mostly with the consent of the patient and doctor). The patient-centric approach is also needed instead of these exploitations. Pharmacies can be a good source of drug-related information for those patients who want to have. Unfortunately, here patients only experience the display and/or advertisement of over the counter (OTC) medicines. Thirdly, in Pakistan, the majority of pharmacies are run by non-pharmacists, that's why a major source of information is missing in most of the pharmacies. The financial objectives of these small enterprises and poor regulatory controls, push pharmacies to neglect basic patient rights.

According to DRAP rules patient information leaflet (PIL) is a part of medicine packaging. The purpose of this PIL is to impart the basic knowledge of medicine to patients. Generally, PIL is written in English & Urdu both, but the technical terms make it difficult to understand for those who can read, and it's useless for those who can't read. The solution to this problem is to make legislation for the use of pictures in PIL. These pictures can be developed by DRAP and all pharmaceutical companies uses only these pictures in PIL. These pictures may about drug preparation, usage, storage, dosage, side effects, etc. This area needs a lot of attention from DRAP, consumer rights organizations and pharmaceutical companies for the welfare of the patient.

Self-medication is a dilemma of third world countries and it’s the biggest cause of antibiotic resistance, apart from the unawareness regarding the hazards of self-medication, it's a symptom of non-existence and/or poor implementation of Govt. rules which are also indicted previously (Jamshed *et al*., 2012). Usually, patients opt for self-medication due to two main reasons. Firstly, the consultation of a doctor is costly in terms of money or efforts. It's the basic responsibility of the state to provide subsidized or free of cost health facility when Govt. paid doctors promote the private practice and private consultation fees of doctors are starting from Rs. 1,500 then patients will have to purchase medicine from the pharmacy. Instead of paying a consultation fee to the doctor, patients visit the pharmacy and purchase medicine as per recommendations of pharmacy worker and mostly they are none pharmacists. The state has to take the responsibility to provide free of cost of medical facility free of cost so that the rights of each social class can be protected.

Even patients consulted doctors once for the treatment of infection, the patient uses the same prescription in case of relapse without consultation of doctors. The reason for relapse may be different than the previous infection, but the patient takes both infections as same on the bases of symptoms they feel. Secondly, it's necessary to discourage the self-medication that drugs cannot be purchased without a prescription. Pharmacies must be bound and checked regularly that drugs cannot be sold without prescription. Otherwise, exemplary actions by DRAP for violations of this rule may have a positive impact on the implementation.

There is also a need to rationalize the expectations of the patient through continuous education to them. Patient's expectations of getting relief within 1 day from infections may push doctors to prescribe high-grade antibiotics at the start of treatment. Mass media campaigns regarding prevention of infections and disadvantages of high-grade antibiotics to treat routine infections can help doctors to rationalize the expectations of patients. Similarly, a doctor's role in rationalizing the expectations of the patient is important along with the implementations of international/local guidelines to treat the infection.

Chapter#5

Conclusion

In this study, the researcher found that the majority of the public is unaware of "antibiotic". Antibiotics are one of the great inventions of a human being. Penicillin was the first antibiotic discovered by Alexander Fleming in (Bayarski, 2006). Before this marvellous discovery, hospitals were full of patients who were suffering from very petty infections e.g. rheumatic fever, gonorrhoea or pneumonia, etc. at that time doctors could do little for such patients either they can wait or hope. Bacteria also became stronger with the invention of high-grade antibiotics. Keeping in view this volatile situation, WHO published an article in 2017 with the name "World is running out of Antibiotics". The purpose of this article was to make us conscious regarding the prescription and usage of antibiotics, otherwise we will be deprived of this great invention and bacteria will push us in the same situation which was prevalent before 1928. Though the majority of the population has used antibiotics in their life the

awareness about recommended usage, dosage, side effects and contraindications is far missing. One thing is encouraging that educated and younger population is much more aware of antibiotics. Patients don't insist on their doctors prescribe antibiotics, but the high expectations of patients push doctors to prescribe high-grade antibiotics. Poor literacy rates, insufficient patient information material is and difficult to understand these materials are the main reasons for reduced awareness about antibiotics.

Antibiotic resistance is increasing due to self-medication. The purpose of this study is to examine the repetition of self-medication with antibiotic to treat upper respiratory tract infections recognized the utilize of antibiotic whether their knowledge of antibiotics, attitude to and perception with self-medication of antimicrobials (Hu *et al*., 2015). Earlier study examines had recognized some migrant groups in New Zealand to have misconceptions regarding antimicrobials and a high ratio of non-prescribed antimicrobials utilize (Norris *et al*., 2010). Many Latino and Asian migrants in the United States were described to have a perception that antibiotics were essential and effective for URTIs (Mangion-Smith *et al*., 2004). Most of the Chinese migrants utilize antibiotics for upper respiratory tract infections without medical discussion in Australia. Misunderstandings regarding antimicrobials utilize were importantly associated with the repetition of self-medication in this group. The conclusions provided significant data for developing culturally responsive interventions for the right utilize of antimicrobials in Australia Chinese societies (Hu *et al*., 2015).

Marketers of pharma companies are also facing challenges that their brand grow very fast without resistance with their antibiotic brand. Pharmaceutical marketers are searching new ways and means to understand consumer perception about antibiotic treatment and how they can grow their brand without resistance, because resistance with their antibiotic brand means less prescribed by doctors and less growth in sales. Findings of this study suggests to pharma marketers to develop a strong marketing campaign for patients that how they can get maximum benefit from antibiotic treatment.

The poor socioeconomic condition of the majority of the population hinders 50% of patients to visit doctors after 3 days of infection when they feel the situation is worst. Most of the patients visit general practitioners and they feel the accurate treatment is not prescribed in their first visit. In our society, those doctors are preferred whose treatment makes the patient better within 1 day. Doctors use aggressive treatment to create their best impression and retain them.

Self-medication is very prevalent in our society, whether self-medication is based on the recommendation of someone in their circle or use the previous prescription in case of feeling of the same symptoms with knowing the actual reason.

Implications

Pakistani pharmaceutical market in 2017 was Rs. 324 billion and there are more than 800 plants are registered (IMS Q1, 2017). Pharmaceutical marketing is a growing profession in Pakistan. Pharmaceutical marketers can develop such marketing strategies which can prevent misuse of antibiotic through an effective patient's awareness campaign that will lead to decrease the antibiotic resistance and ultimately it will enhance the life of antibiotic in doctor's prescription. This is a major goal of any pharmaceutical marketer.

Patient education regarding self-medication, insisting doctors for unnecessary usage of antibiotics, indicators of prescription change by chemists and rationalization of expectations from treatment is a highly important area where a lot of gaps exist. Similarly, DRAP must also safeguard the interests of the patient against the pharma-doctor collaboration.

Govt. regulators (e.g. DRAP) must develop such policies and rules which discourage the self-medication by patients. At the same time, such rules and policies must also be developed for doctors to follow international guidelines, prescribe low-grade antibiotics and increase gradually according to the condition of the disease. Antibiotics and other medicines must the sold-on prescription only. There is also a need for a mass media campaign for normalizing the expectations of patients regarding recovery from infections, so that doctors can use the antibiotics judicially.

DRAP can also push pharmaceutical companies to set up a toll-free number for the awareness of their medicine brands (LATIF, 2017). Patients from any part of the country can call and have basic information regarding medicines. Web sites can also be developed by pharmaceutical companies, according to the same pattern of PIL that is mentioned above. Web sites users are mostly educated, they may need detailed version PIL e.g. Contraindications, drug interactions, the drug can be used with or without food, age of patients who can use and hazards of self-medication, etc.

Future research

This study has focused only on users of antibiotics, other medications e.g. pain killers, anti-allergies, cough syrups and anti-pyretic also needs to be researched.

The majority of our population is illiterate or unable to understand bit technical things like medicine. There is a need to research the signs and words regarding the instructions of medicine for such population segments.

Limitations

The researcher used data on just antibiotics users. Data was collected from Rawalpindi & Islamabad users due to constrained time and financial resources.

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