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Rational Use of Drugs at Non-Governmental Health Facilities in the Gaza Governorates.

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Dedication

I dedicate this dissertation to the memory of my late father, his spirit inspired me throughout conducting this study

To my extraordinary mother and my sisters for giving me the faith and passion to complete this study.

I dedicate this research for all of them…

Haneen Mohammed Taha

Declaration

I certify that this thesis submitted for the degree of master is the result of my own research, except where otherwise acknowledged, and that this thesis or any of its parts has not been submitted for higher degree to any other university or institution.

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Yours faithfully

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Abstract

Irrational use of drugs is considered as the main health resource wasted. WHO encouraged countries to implement drug promoting programs for appropriate use of drugs which could save up to (5%) of countries health expenditure.

The overall aim of the study is assessing the drug use at the NGHs in the GG based on the recommended WHO core prescribing indicators, assessing the prescribing writing skills and assessing the knowledge, attitude and practice of the NGHs physicians toward local formulary. The design of this study is a cross section: quantitative analytical design. The quantitative data were collected using 3 tools: First tool was a well-structured questionnaire which was used to collect data on physicians' knowledge, attitude and practice toward local formulary. The other tools are three checklists that were used to collect data on Physicians' compliance with WHO core prescribing indicators and prescribing writing skills. Finally, the last tool is developed key drugs list based on drug list in the MOH hospitals and included recommended WHO key drugs. In total, 198 questionnaires were collected. 1130 checklist was used to extract data from the in-patient medication sheets (admitted cases); 898 checklists were used to extract data from discharge sheet; and 998 checklists were used to extract data from the out-patient reports. Analysis of data was conducted using SPSS program; the analysis involved conducting frequency distributions, mean percentages, one-way Anova and Chi square test.

Findings of the study have showed that there is a positive attitude among physicians about the local formulary and its benefits. The majority of the study participants agreed on the importance and necessity of local formulary for: provision of quality health services; reduction of wasting in financial resources; reducing patient harm; and on the fact that the listed drugs in the local formulary are selected on scientific bases. Also, a positive practice orientation toward prescribing drugs from local formulary had been shown. The majority of the study participants didn't communicate with hospital pharmacists properly. There was a negative perception toward hospital management efforts. Provision of treatment protocols was neglected. On the other hand, Polypharmacy prevalence was (2.5) and highest prescribed therapeutic drug groups were analgesic (38.9%) and antibiotics (33.9%). More than two thirds of encounters with antibiotic (67.9%) and one third of encounters with injection (30.2%). Very low percentage in using generic name of drugs (3.3%). The majority of the drugs prescribed from the local formularies (88.7%). The average drug costs per encounter in the NGHs was (10.9$). Less than half of the drug costs in the NGHs spent on antibiotics. Regarding prescription writing skills, prescribers showed good compliance in writing prescriber's information while poor compliance occurred in patient's information and prescriptions information. Percent of the availability of key drugs in the stock in NGHs range from (70.8%) to (100%).

There is a need to develop approved local formulary and treatment protocols in each hospital, implement a continuous education and training programs concerning local formulary and treatment protocols; to disseminate printed and softcopies copies of the hospital local formulary; to activate the monitoring and computerized system to improve physicians' drug prescribing pattern. There is a need to conduct more research studies (qualitative and quantitative studies) to compare patient care indicators in the governmental hospital and NGHs in the GG.

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List of Abbreviation

DFID	Department for International Development
DTC	Drug Therapeutic Committee
EDL	Essential Drug List
FDA	Food and Drug Administration
GDP	Gross Domestic Product
GG	Gaza Governorates
MOH	Ministry Of Health
NGHs	Non-Governmental Hospitals
NGOs	Non-Governmental Organizations
NHP	National Health Plan
NSAIDs	Non-Steroidal Anti-inflammatory Drugs
PCBS	Palestinian Central Bureau of Statistics
PFBS	Patient Friend's Benevolent Society
PHC	Primary Health Care
PNA	Palestinian National Authority
PNF	Palestinian National Drug Formulary
PNGOs	Palestinian Non-Governmental Organizations
RUD	Rational Use of drug
SHC	Secondary Health Care
STGs	Standard Treatment Guidelines
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
WB	West Bank
WHO	World Health Organization

Chapter One

Introduction

1.1 Background

Rational Use of Drugs (RUD) concept concerns with drug therapy part from the overall medical intervention. RUD is considered as a main stone to evaluate the quality of health care for any health care system. RUD or it can call as Rational Use of Medicines (RUM) defined as Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (Adogu, Okechukwu, Egenti et al., 2015).

Irrational use of drugs is a global phenomenon. More than 50% of all drugs worldwide are prescribed, dispensed or sold inappropriately, while 50% failed to take them correctly (Desalegn, 2012). Moreover, about one-third of the world's population lacks access to essential drugs. Across developing countries, spending on drugs accounts for 20-60% of cumulative healthcare expenditure, with upwards of 90% of the population purchasing medicines directly out of pocket (WHO, 2015). Also, irrational use of drugs is considered as wasting of resources which lead to reduce the capability of providing other vital drugs, beside all this facts about economic consequences of using drugs irrationally, the irrational use of drugs have public health consequences as: antibiotic resistance, due to widespread overuse of antibiotics, as well as their use in under-therapeutic dosage, risk of infection due to improper use of injections as injection-related disorders are abscesses, polio, hepatitis and AIDS (ÇELİK, ŞENCAN, & CLARK, 2013; Persad, 2019),

WHO recognized the importance of RUD objectives in the developing countries and developed countries so far, so, the National Drug Policy has been promulgated in 1995 for implementation the agreed objectives of the National Health Policy prepared in 1991 of which represented in providing health for all and improving and managing the activities related to drug production, import, export, storage, supply, sales, distribution, quality assessment, regulatory control, rational use and information flow (Kanter, 2019).

In the year 2000 Palestinian Ministry of Health (MOH) developed the first Essential Drug List (EDL) which had been considered as an important first step to improve and maintain the availability, accessibility and appropriateness of drugs provided to clients. The process

was guided by WHO recommendations for selection and update of local formulary. As a result, Palestinian MOH established the Palestinian National Drug Formulary (PNF) in the year 2002. Training courses were implemented among the majority of governmental health care staff during 2002-2004. Later on, local formulary was updated several times, the last one was in 2013 (MOH, 2013).

UNRWA clinics operate on the basis of a list of drugs that closely follows the WHO local formulary and MOH facilities working based on two drug lists: one in the Gaza Governorates (GG) and one in the West Bank (WB) with the purpose of improving the prescription patterns (Obeidallah, Mahariq, Barzeq et al., 2000), although these facts, an irrational use of drugs in UNRWA clinics and MOH facilities occur.

The governmental hospitals facilities in the GG still suffer from over prescribing, irrational prescribing and prescribing expensive brand name drugs are prevalent in health facilities. The problem is very serious because of the large consumption of drugs, thus mainly due to governmental health facilities either hospitals or Primary Health Care (PHC) services are provided almost freely for persons with medical insurance. Also, other factors as the poor level of communication between the medical staff (physicians and pharmacist) and the managerial staff play an important role in irrational use of drugs (Bisan Center, 2006) .

Palestinian Non-Governmental Organizations (PNGOs) have increasingly been promoted as alternative health care providers in the GG, furthering the same goals but less hampered by government inefficiencies and resource constraints. However, the reality of the NGO health care provision is more complex. The NGOs may suffer from resource constraints and management inefficiencies similar to those of government providers. For their drug supply, they tend to rely on donations from international NGOs and other organizations. However, when in need, they buy from local manufacturers and wholesalers (Kruk, Freedman, Anglin et al., 2010). Regarding drug expenditures of PNGOs and charitable societies, reliable data on their drug expenditures are not available and are difficult to obtain and PNGOs generally charge nominal fees for drugs. Obeidallah and colleagues (2000) illustrated that drug expenditures of PNGOs are estimated at around 8 million US$ a year. It was estimated that on average 80% of the NGOs budget was funded by external donors (Gerster 2012).

For the local drug list in the NGO hospitals in Palestine, many NGOs operate on the basis of a restricted list and WHO was recommended to implement local drug list for NGO hospitals and at all levels of care (Obeidallah, Mahariq, Barzeq et al., 2000).

This study will handle RUD subject in terms of prescribing drugs pattern in the PNGO hospitals in the GG to evaluate and asses the drug use situation by measuring the WHO indicators and the related factors that can affect in drug use. Irrational use of drugs may result due to various reasons and may lead to serious negative health and economic consequences.

1.2 Research problem

The high cost of health services can represent a true challenge to reach WHO global goal "universal coverage", the health expenditure is about 5.3 trillion US$ which represents one of the largest portions of expenditure in the world (Xu, Saksena, Jowett et al., 2010). Moreover ,wasting health resources due to misuse is another challenge to reach the global goal, the wasting in conservative estimate percentage is ranged from 20-40% (WHO, 2010b) and drugs consider as the main health recourse wasted due to irrational use of drugs. Improper prescribing behavior of drugs by prescribers has a negative impact on medical resources and lead to serious financial overload, as well as undesired health impacts on patients. In the same context, WHO encouraged countries to implement drug promoting programs for appropriate use of drugs which could save up to 5% of countries health expenditure (WHO, 2010b).

On the other hand, Palestinian Central Bureau for Statistics (PCBS) demonstrated that the Palestinian National Authority (PNA) spent about 11% of the Gross Domestic Product (GDP) on health (PCBS 2016a) , also, the Palestinian MOH and the PCBS indicated that PNGOs account for 32% of the total number of hospital beds , and for 26% of the human resources employed by the sector (Al-Ghanim, 2004; Mataria, Khatib, Donaldson et al., 2009). Also, PNGOs share 8% of the total health services utilization while United Nation Relief and Works Agency (UNRWA) accounts up to 46% of health service utilization. The low utilization of NGO health services is explained by the availability of public health insurance and (in UNRWA's case) free services (Bisan Center, 2006).

Several studies had been conducted in the GG and clarified the presence of irrational use of drugs in the different health provider sectors the MOH and UNRWA. In MOH PHC clinics

and hospitals in the GG, studies showed poor using and compliance with local formulary, low percentage in using generic name of drugs and polypharmacy (Fattouh & Hamad, 2010; Al-khodary, 2016).

In addition, PHC UNRWA clinics in the GG studies explored polypharmacy, high percentage of encounter receiving antibiotic, high percentage of compliance with UNRWA formulary (Saleh, 2008; Baba, 2012).

Regarding to NGO health facilities, there is one study had been conducted in PHC NGOs clinics in the WB and showed polypharmacy prevalence and high encounter receiving of antibiotic (Khatib, Daoud, Abu-Rmeileh et al., 2008) while in the GG, as far as researcher known, no study indicated the use of drugs in non-governmental hospitals (NGHs).

Generally, information in prescribing practices in Palestine is lacking so this study will contribute in providing more information about the prescribing pattern in one of the main health providers in the GG.

1.3 Justification

In the GG, prescribing indicators had been studied to measure the rational use of drugs (RUD) in the MOH hospitals. The study found that a polypharmacy present and around two thirds of the physicians showed no compliance with local formulary drugs (Al-khodary, 2016). In addition, a study conducted in MOH PHC clinics illustrated that the poly-pharmacy prevalence among elderly patients (Abed, 2011). On the other hand, an evaluation study in all the governmental PHC clinics in the GG and found that high compliance with local formulary from the physicians participated in the study using the local formulary and half of them reported problems in using it. There is a polypharmacy evidence with very low compliance in prescribing drugs by generic name (Fattouh & Hamad, 2010).

On the other hand, studies conducted in PHC UNRWA clinics indicated that majority of the prescribers showed compliance in prescribing drugs from UNRWA formulary, on the other hand, the study illustrated that low prescribing of injection, low prescribing by generic name, high encounter receiving antibiotic and polypharmacy prevalence (Saleh, 2008; Baba, 2012).

In the same context, In the WB, CARE International conducted a study in 41 NGOs PHC and showed polypharmacy prevalence and high encounter receiving antibiotics. Also, high injections and combined medications percentage present. Provision of reference sources and treatment guidelines implementation were also inadequate (Khatib, Daoud, Abu-Rmeileh et al., 2008).

To the researcher best knowledge, this study will be the first to handle the topic of RUD at the NGHs in the GG in the proposed focus way.

This study will conduct in the NGHs in the GG to provide information about core prescribing drugs indicators in regard to patient treatment, these indicators used to measure the performance of the prescribers. The drug use indicators are best understood as first line measure to estimate further questioning and guide subsequent action.

1.4 Study objectives

1.4.1 General objective

The study aims to assess the drug use at the NGHs in the GG based on the recommended WHO core prescribing indicators.

1.4.2 Specific objectives

More specially the study aims to address the following objectives:

1) To assess the drug prescribing practice at the NGHs in the GG.
2) To assess physicians' current level of knowledge, attitudes and practices concerning local formulary at the NGHs in the GG.
3) To investigate the prescription writing skills of the physicians at the NGHs in the GG.
4) To compare the compliance of the prescribers in prescribing drugs from local formulary and the knowledge about the presence of hospital local formulary by various variables between selected NGHs in the GG.
5) To propose recommendations that could improve physicians' practices at the NGHs in the GG.

1.5 Research questions

1) How is the situation regarding drug prescribing practices at the NGHs in the GG?
2) What are the practices deficiencies in prescribing at the NGHs in the GG?

3) What are the prescribing trends of physicians concerning prescription writing skills?
4) What are the main factors affecting drug prescribing practices at the NGHs in the GG?
5) Are physicians aware of the concept of local formulary?
6) Have physicians participated in updating local formulary?
7) To what degree physicians comply with local formulary at the NGHs in the GG?
8) Do the NGHs implement effective local formulary orientation programs for the medical staff?
9) Do we have variations in prescribing practices among different NGHs in the GG?

1.6 Context of the study

1.6.1 Geographic context

Palestine is a geographic region in Western Asia between the Mediterranean Sea and the Jordan River, it lies between longitudes 33' 15" and 29' 30"; and between latitudes 35' 40" and 34' 15". the entire area of Palestine is about 27,009 Km^2, stretching from Ras AlNakoura in the north to Ommerreshrash in the south. Palestine is bordered by Lebanon in the north with a border length of 79 km; Syria with border length of 70 Km, and Jordan with border length of 360 Km from the east. To the south, Palestine is bordered by Egypt with a total length of 240 Km border. Mediterranean Sea limits Palestine from the west with a coast length of 224 Km. Palestine also overlooks the Gulf of Aqaba with a coast length of 10.5 Km {AlDabbagh, 1997 #59;amcham, 2015 #294} . Nowadays, PNA is limited to two geographically separated areas, the GG (also called southern governorates, Gaza Strip, GS), and the West bank governorates (also called northern governorates, WB), with a total area of 6020 Km^2 which represents 22% of historical state of Palestine (PCBS, 2013a). The GG is the southern district in the Palestinian Authority territory and is located in the south-west of Palestine with an area of 365 Km^2.

1.6.2 Demography context

According to the PCBS Population, Housing and Establishments Census 2017, in 2017, the population of occupied Palestine was estimated 4,780 million, in the WB (including East Jerusalem) 2,881 million and 1.899 million living in the GG. Approximately 61.1% resided in the WB and 38.9% in the GG. Males ratio to Female respectively is (103:100). 39.7 % of Palestinian population is below 17 years (47% in the WB and 48% in the GG). The population is expected to increase by 50% by 2020. Population density of Palestine is varying according to the geographical area: 5,204 individuals/km^2 in the GG. Population

density of Palestine is varying according to the geographical area, in the GG it is 5,204 persons/ Km^2 compared to a WB of 510 persons/ Km^2 in 2017 (PCBS, 2018), noting that 66% of the total population of Gaza Strip are refugees. The flux of refugees turned the Gaza Strip in one of the highest population densities in the world (BCPS, 2018). The refugee population is refugees represented 42.5% of the population of the State of Palestine (2017), living in 27 refugee camps. In Jerusalem, there are 91,274 registered refugees and 18,719 non- registered refugees (PCBS, 2016).

The GG population spread over five governorates; North Gaza, Gaza City, Mid Zone, Khan-Younis and Rafah (PCBS, 2013). The population includes 67% refugees and 33% non-refugees, with high literacy rate estimated by 96.4%. The poverty rate among the GG population reached about 38% (PCBS, 2013b). This high population density demands a huge covering of essential services, most importantly the health services. Moreover, the high poverty and unemployment rates increase the burden on the country as a whole and on the health system in particular, specially the governmental sector.

1.6.3 Socio-Economic Context

The financial circumstances in the GG characterized by high level of poverty and low income, the difficult political and economic conditions deteriorate the life of people due to the high level of uncertainty and recurrent wars (Elshaer, 2016). People suffer from the constricted siege that prevents importing and exporting of goods and aids across the GG borders.

The Palestinian economy has severely damaged because of the current political situation and the siege imposed on the GG. Since the end of the second intifada, Israel has imposed a blockade on the GG in addition to recurrent wars and other attacks on the territory resulted in degraded economic conditions and mass destruction of infrastructure and industry. Israel-Gaza border closures, which became more limiting after Hamas held control of the GG in June 2007, have resulted in high unemployment, high poverty rates, and collapse of the private sector that had depended on mainly on export markets (Al-qedra, 2018).

In the GG, the unemployment rate reaches 49.1% but in WB it was 18.3% in the 1st quarter 2018, and for men it was 25.0% but for women it was 48.9%. young people (20-24 years), had the peak unemployment rate in the 1st quarter 2018 (49.6%) (PCBS, 2018).

1.6.4 Political context of the GG

After the beginning of Al-Aqsa intifada (2000), Israeli siege and closure of crossings was imposed on the GG. The Israeli authorities implemented a collective punishment to all Palestinians in the GG by tightening the siege more intensively after the Palestinian legislative elections in 2006 and the election of Hamas Islamic movement. Intensity of the sieges and continuous blockade of borders were dramatically increased after the political rift in 2007. In 2016 Israel continued to enforce severe and discriminatory restrictions on Palestinians' human rights, to facilitate the transfer of Israeli civilians to the occupied WB, and to severely restrict the movement of people and goods into and out of the GG. The allowed imports to the GG amounted to less than half of the 2006 pre-closure levels ("World Report," 2014). In 2013, deterioration of the health status has increased due to bad economic situation after the closure of the illegal tunnels with Egypt, which was considered in certain period of time as a sole source of all goods needed for the GG. The MOH became hardly able to provide all operational needs of the health services including drugs, medical disposables, medical equipment, lab materials, and others. Additionally, services are frequently interrupted by electricity blackouts and insufficient supplies of drugs and disposables and limited training opportunities for medical staff. This further threatens the health of the population, which is already at increasing risk. Following the establishment of the reconciliation government, there is a void in local leadership at ministerial levels and in sufficient cash flow causing an imminent threat of a breakdown in key public health services. This comes on top of an already severely strained situation caused by ten years of Israeli siege on the GG (UNRWA, 2014).

1.6.5 Palestinian health care system

The first official National Health Plan (NHP) was published in 1994 and developed and published again in 1999. NHP aimed to regulate the health sector and integrate the activities of the four main health-care providers: the Palestinian MOH, PNGOs, the UNRWA, and a cautiously developing private sector (Mataria, Khatib, Donaldson et al., 2009), In the GG the health infrastructure comprises of MOH, UNRWA, PNGOs, military medical services and numerous private sector health care providers (Health cluster, 2014) . Since 2000 the health care system deteriorated due to unstable political situation. UNRWA and NGOs sector role is supporting MOH health facilities and decrease workload. UNRWA provides PHC services to the refugee population, and purchases secondary and tertiary care services when needed. The NGOs sector is supported by international

organizations and community resources. They include organizations with social, and political motivations. They provide different health services including outpatient and inpatient care, psychosocial support, rehabilitation, health education, and emergency care (Schoenbaum, Afifi, & Deckelbaum, 2005). The private for-profit health sector also provides the three levels of care through a wide range of practices (WHO Strategy, 2005).

1.6.6 Palestinian non-governmental health organizations (PNGOs)

The NGOs, in general terms, are defined as private, voluntary agencies which fund, implement or actively support development assistance programs (Frantz, 1987). NGOs were the services provider services for the most Palestinian marginalized groups and provided essential services that the Israelis failed to make them available (PASSIA, 1998). PNGOs received substantial financial support from local charities, the Palestinian Liberation Organization (PLO), Arab governments and NGOs, as well as foreign donor states and NGOs. PNGOs divided to private-, For-Profit-Sector and private-, For non-Profit-Sector and both have their own services, number of them specialized in certain health care services (Abuiyada & Abdulkarim, 2016).

Unlike health NGOs in the other parts of the world, PNGOs have had a busier and more complex agenda that could not be adequately realized solely by providing health services (Abdulhadi, 1996). In addition to providing desperately needed health services, PNGOs had to become involved in national struggles in their own ways. These factors contributed to the uniqueness of Palestinian NGOs (Claudet, 1996).

PNGOs bankrolled by private benefactors encompass a sizable portion of the health care economy in the PNA. A World Bank survey found that 11.7% of Palestinians used NGOs most frequently for their health needs. 13.3% of households in the WB relied on NGOs compared to 8.1% of households in the GG. The World Bank report explained that fewer NGOs operate in the GG than in the WB and that Gaza residents are more likely to be classified as refugees and therefore to have access to services provided by UNRWA. The Department for International Development (DFID), a British government agency, found that a visit to an NGO-run PHC clinic cost twice as much as a visit to a government clinic and four times as much as a visit to a UNRWA facility. PCBS put the figure at 26% in 2005 (Bisan Center, 2006) while in 2015, Palestinian Health Information Center (PHIC) annual report of the GG indicated that NGOs employed 19.7% of workers in the Palestinian health sector in both PHC center and hospitals.

1.6.7 Pharmaceuticals in Palestine

The MOH is responsible for ensuring the availability of pharmaceuticals to patients. The Palestinian Government suffer from severe financial constraints due to many reasons first the difficult political situation, second, the limited resources available to the government and third, the governments heavy reliance on international assistance lead to become the MOH is unable to meet the needs of patients in either the WB or the GG at all times from its stocks of pharmaceuticals or to ensure the availability of needed medical supplies (Assembly, 2016). In 2015, Palestinian MOH suffered from a budget deficit which count as 44%, drugs and medical and laboratory supplies consumed most of the MOH's budget (Shahin, 2011). In 2015, 30% of essential drugs and between 25 and 30% of medical equipment were unavailable. According to PNA Pharmaceutical Country Profile in 2011. In Palestine, the total annual expenditure on health (THE) in 2008 was US$ 893.8 million. The total annual health expenditure was 15.6 % of the GDP. The total annual expenditure on health per capita was US$ 165.5. Total public expenditure on pharmaceuticals is 54.1 million US$ (Shahin, 2011). For NGOs clinics in the WB, a study showed that the large NGOs had a selection committee responsible for decisions with regard to the quality and quantity of centrally purchased medications. However, in these organizations it was not possible to adhere to the local formulary mainly because specialists decide about what is needed in most cases. On the other hand, main institutions' and individual clinics' procurement systems depended largely on cash availability. Bulk purchasing was not always possible and tendering was not practical for small clinics. Most medications were locally purchased or obtained through donations (Khatib, Daoud, & Mataria, 2004).

1.7 Operational definitions of terms

1.7.1 Rational use of drugs (RUD)

Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (Kar, Pradhan, & Mohanta, 2010).

The researcher defines RUD in term of prescribing practices and formulary situation in the selected health facilities by evaluate the current situation with the WHO recommendations, thus can occur by measuring prescribing indicators and health facility indicators.

1.7.2 Key drugs

A short list of 10-15 essential drugs must be compiled that should always be available (WHO, 1993).

The researcher defines key drugs list of the hospital as a list of essential drugs for all departments in the hospital that should always be available**.**

1.7.3 Local drug list

It Is a selected list of drugs in NGO health facility, the list selected with regard to disease prevalence and public health relevance, evidence of clinical efficacy and safety, and comparative costs and cost-effectiveness (WHO, 2013).

The researcher defines local drug list or formulary of the hospital as those drug list or formulary was considered as the priority of the hospital in the last two years. the drugs had been choosing depend on the hospital services, evidence on efficacy and safety and comparative cost-effectiveness.

1.7.4 Non-Governmental Organizations (NGOs)

The term NGOs is broad and encompasses a whole set of institutions, associations and organizations that constitute the so-called third sector (Abuiyada & Abdulkarim, 2016) .

1.7.5 Secondary Health Care (SHC)

In Palestine, hospitals provide secondary and tertiary health care services. the main provider for the SHC services is hospitals.

The researcher defines SHC services as all services provided through hospitals except the services which are provided in the tertiary hospitals, these services which involved the following: oncology, hematology department, Burns unit, diagnostic radiology, ophthalmology, obstetrics and gynecology service, neonatal intensive care unit, open heart surgeries, catheterization unit , mental health (psychiatry and psychology) and physical therapy (Hensher, Price, & Adomakoh, 2006).

Chapter Two

Literature Review

This Chapter starts by presenting the conceptual framework guiding this study; then, it highlights Palestinian health care system and local formulary concept and content training program, prescribers' practices and their impact in RUD based on WHO recommended groups of indicators, health care facility factors that affecting from the managerial point of view. Finally, it reviews the RUD concept, ways to promote the RUD and causes of irrational drug use.

2.1 Conceptual framework

According to the literature the RUD in the NGHs effected by three factors which are health care system in Palestine in general and in the GG particularly, prescribers' practices and the health care facility **Figure (2.1).**

2.1.1 Palestinian health care system

Since 1967, a division of the Israeli Military known as the Health Department of the Civil Administration (HDCA) had been responsible for overseeing health care in the occupied territories. During this time, HDCA's work was greatly supported by three other major sources of health care: NGOs, the UN, and the private sector. Shortly after Oslo and the corresponding transfer of jurisdiction, the PNA established a MOH to administrate health care in Gaza and the West Bank (Wikipedia, 2019).

The Palestinian MoH, UNRWA, Military Health Services, NGOs, and the private sector cover primary, secondary, and tertiary health care services. According to the MoH (2017), there are 743 primary health care centers in Palestine (583 in the West Bank and 160 in Gaza), and 81 hospitals (51 in the West Bank, including East Jerusalem, and 30 in Gaza)(PNIPH, 2018) .

According to WHO recommendation countries and institutions can promotion RUD by implementing approved and effective activities included: standard treatment guidelines; essential drug lists; drug and therapeutic committees; problem-based basic training in pharmacotherapy; and targeted continuing education.

However, when these activities are being implemented, care is necessary to ensure success (Laing, Hogerzeil, & Ross-Degnan, 2001).

2.1.1.1 National Drug Policies and the essential drug list

Drugs make an essential contribution to the health of the community, but rapidly rising drug budgets have caused governments to seek ways of ensuring this expenditure results in value for money. The National drug Policy was established against this background to implement a quality use of drugs (Weekes, Mackson, Fitzgerald et al., 2005).

Compliance with local formulary is established effectively and efficiently in the presence of policies and guidelines (WHO, 2003b).

2.1.1.2 National Standard Treatment Guidelines (STGs)

The goal of the Standard Treatment Guidelines is to promote high standards of clinical practice and to improve the quality of health care to the public. STGs summarize recommended prevention and treatment strategies for commonly occurring disease conditions in the country (WHO, 2017).

2.1.1.3 Medical education and training program

Medical education is education related to the practice of being a medical practitioner; either the initial training to become a physician (i.e., medical school and internship), or additional training thereafter (e.g., residency, fellowship and continuing medical education).

Medical education and training vary considerably across the world. Various teaching methodologies have been utilized in medical education, which is an active area of educational research (Flores-Mateo & Argimon, 2007).

2.1.1.4 Monitoring and evaluation system

Monitoring and evaluation (M&E) has gained increasing significance in the health sector during the last decade, partly due to increasing public demand for measurement and accountability in the use of health sector resources (Glasgow, Vogt, & Boles, 1999).

2.1.2 Prescribers' practices

Physicians are the main prescribers of medication for the patients so they have a direct impact in RUD. Prescribers' practices affected with number of factors as prescribers' characteristics, prescribing pattern, continuous in-services education and training programs, prescription written skills. The rational drug prescribing practice is an important

health concern around the globe that not only interferes patient's life but also the socioeconomic issues (Amin, Khan, Azam, et al., 2011).

2.1.2.1 Prescribers' characteristics

Physician's characteristic includes socioeconomic characteristics, years of work experience, work attitude, and knowledge. Socioeconomic characteristics includes: age, gender, place of permanent residency, place of work, managerial positions gained during his work, and type of medical specialty.

2.1.2.2 Prescribers knowledge and attitude

The prescribers' characteristics include socioeconomic characteristic represented in the work knowledge and attitude, experience of the prescribers and level of education (Wilson, Hatcher, Barton et al., 1996), studies showed that the scientific evidence was very important in influencing their prescribing practices (Ladd, Mahoney, & Emani, 2009; EFMHACA , 2012).

In relation to the physicians' knowledge and attitude, according to WHO guidelines, the medical staff should have adequate knowledge and training in the health care service they provide. The medical staff attitude towards prescribing drugs from the local formulary will affect their compliance with it and the service they provide. Compliance with local formulary needs a specialized medical staff who believes that local formulary will improve the services more than other drugs (WHO, 2002a).

2.1.2.3 Prescribing pattern

Irrational prescribing is a global problem. Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs. Irrational prescribing patterns are perpetuated through patient pressure, bad example of colleagues, and high-powered salesmanship by drug company representatives (EFMHACA , 2012).

Assessment of drug use patterns with the WHO drug use indicators is becoming increasingly necessary to promote RUD in developing countries (WHO, 1993; H. V. Hogerzeil, Ross-Degnan, Laing et al., 1993). Before activities are started to promote RUD, an effort should be made to describe and quantify the situation. Several well-established survey methods are available for this purpose. One assessment method is a prescribing survey using the WHO health facility drug use indicators. These quantitative indicators are

now widely accepted as a global standard for problem identification and have been used in over 30 developing countries (Laing, Hogerzeil, & Ross-Degnan, 2001).

2.1.2.4 Prescribing writing skills

Prescribing is one of the biggest steps in practice in the transition from being a medical student to being a Foundation Year 1 (F1) doctor. Prescribing could be considered simplistically to consist of two related but distinct components: the pharmacological knowledge (basic and clinical) which provides the knowledge base that is required to understand drug effects, interactions and contra- indications and the practical and procedural skills of prescribing such as calculating the correct dosage and writing up a prescription on a drug chart. Both components are essential for safe and effective prescribing (Rothwell, Burford, Morrison et al., 2012).

2.1.2.5 Continuous in-services education and training programs

Even though 75% of CEOs worldwide say that a skilled, educated, and adaptable workforce should be a government/business priority, there's a growing lack of experienced and well-trained staff in the healthcare environment in many regions around the globe. To counter this trend, there's a need to raise awareness that education doesn't come to an end once people are in the middle of their professional career. Because the healthcare industry is continuously evolving, technologies considered best practice today can change drastically in just the span of a decade. That's why care providers have to regularly keep up with new techniques and technologies and expand their knowledge and skills – which means continuous education is not a nice-to-have but an absolute necessity for any healthcare professional who wants to provide high-quality patient care (Health Management.org, 2017).

2.1.3 Health care facility

In this component, we studied the factors that affecting in the health care facility from the managerial point of view as drug availability (procurement and donation), Drug therapeutic committee (DTC), availability of local formulary and self-auditing and monitoring system.

2.1.3.1 Drug supply and availability (procurement and donation)

Increasing population, widening income gaps, changing epidemiological patterns, constrained public budgets and rising pharmaceutical expenditures are pressing governments to find new approaches to ensure equitable access to drugs as RUD; and

quality, safety, and efficacy of drugs. Availability of drugs could be through donation or procurement. Donation may be channeled through aid agencies in emergency situations or be included by governments in development aid. They may be sent from groups of concerned individuals or NGOs with regular links to the developing world. Drug donations may also have a commercial face; used by companies to obtain tax deductions on unused stock or create a later market for certain products (WHO, 1996).

2.1.3.2 Availability of local formulary

Availability of local formulary is considered as a challenge, lack of systematic procurement, supply and distribution system and poor demand management are all the key reasons for low availability.

The availability of local formulary in health care facility is so crucial that no health care services can be provided without such availability. It represents one of the main building blocks of a sound health care system (WHO, 2010a).

2.1.3.3 Drug therapeutic committee (DTC)

DTC is the committee that evaluates the clinical use of drugs, develops policies for managing pharmaceutical use and administration, and manages the formulary system. DTCs can provide the leadership and structure to select appropriate drug for the formulary, identify drug use problems, promote RUD, and help reduce pharmaceutical costs (USAID, MSH, WHO, 2007).

Also, regarding WHO, DTC main objective is to ensure the efficiency and quality of hospital services through optimal use of drugs (WHO, 2003).

2.1.3.4 Self-auditing and monitoring system

There is a need to establish simple systems to monitor key pharmaceutical indicators that might change as a result of implementing system-wide reforms. Policy-makers and managers should select a few locally appropriate indicators and collect them on a regular basis in order to be able to respond in a timely way to negative changes (Laing, Hogerzeil, & Ross-Degnan, 2001).

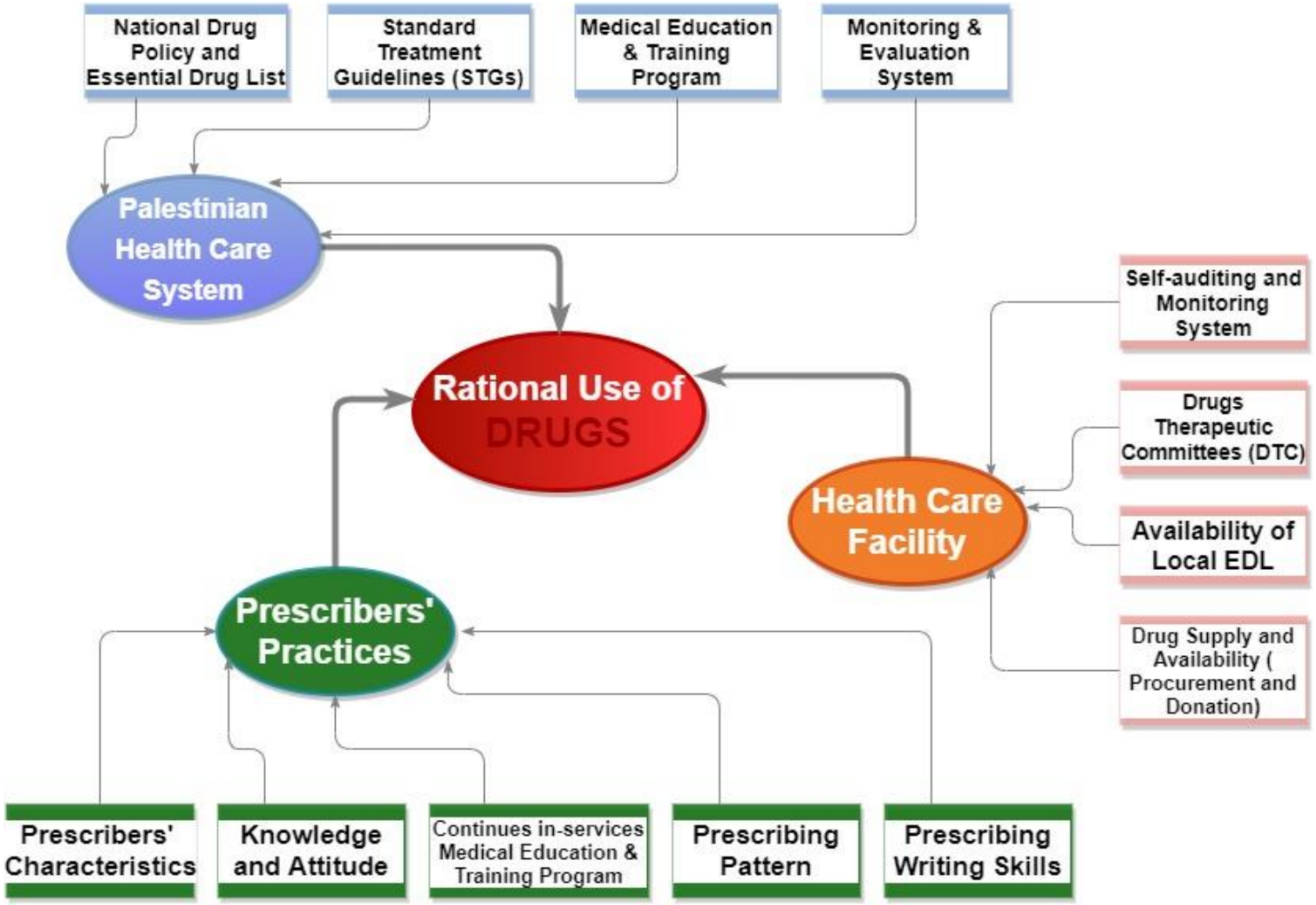

Figure (2.1): Self -developed conceptual framework

2.2 Literature Review

2.2.1 RUD Concept

RUD is defined as Patients receive drugs appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (WHO, 2002a), irrational use occurs with polypharmacy, using wrong or ineffective medication, underuse or incorrect use of effective medications. These actions negatively affect the quality of therapy, raised the cost of therapy or cause adverse reaction or negative physic social effects. Prescriber lack of knowledge and experience, prescribing process, patient and community decision and the health system itself all consider as factors can lead to irrational use of drugs (WHO, 2012).

In 2010, the WHO reported that nearly half of the drugs are used inappropriately (WHO, 2010c). Irrational use of drugs lead to Lack of access to drugs and inappropriate doses result in serious morbidity and mortality, particularly for childhood infections and chronic diseases, such as hypertension, diabetes, epilepsy and mental disorders, Inappropriate use and over-use of drugs waste resources - often out-of-pocket payments by patients - and result in significant patient harm in terms of poor patient outcomes and adverse drug reactions. Furthermore, over-use of antimicrobials is leading to increased antimicrobial resistance and non-sterile injections to the transmission of hepatitis, HIV/AIDS and other blood-borne diseases, Finally, irrational over-use of drugs can stimulate inappropriate patient demand, and lead to reduced access and attendance rates due to drugs stock-outs and loss of patient confidence in the health system (WHO, 2002b).

Strategies to address irrational use of drugs characterized as educational, managerial, economic or regulatory, whichever method is selected a successful intervention is likely to focus on key factors, target facilities with the poorest practices and use credible sources and communication channels (WHO, 2012).

2.2.2 Promotion of RUD

In 2014, the world bank reveal that the total global expenditure for health represent 9.9% from global GDP (World Bank Group , 2014) .The WHO estimates that the appropriate use of drugs can result in about 50%–70% cost-efficiency in drugs expenditure (Asenso & Agyeman, 2016). The WHO (2002) recommended twelve useful and effective core interventions to promote RUD. However, when these activities are being implemented,

care is necessary to ensure success. These twelve core interventions include: (1) a mandated multi-disciplinary national body to coordinate drug use policies; (2) standard clinical treatment guidelines (STGs); (3) local formulary based on treatments of choice; (4) drug and therapeutic committees in districts and hospitals (also called Pharmacy and Therapeutic committees, P&T committee); (5) problem- based pharmacotherapy training in undergraduate curricula; (6) continuing in-service medical education as a licensure requirement; (7) supervision, audit and feedback; (8) independent information on drugs; (9) public education about drugs; (10) avoidance of perverse financial incentives; (11) appropriate and enforced regulation; and (12) sufficient government expenditure to ensure availability of drugs and staff (WHO, 2012).

2.2.3 Strategy to promote RUD

The following strategies have been advocated by WHO for promoting RUD (WHO, 2002a). There is 3 M concept in RUD: Medicines Mean Money. Thus, RUD means less profit and income for those dealing with drugs; prescribers, and sellers.

WHO has recommended national strategies to promote the RUD as previously mentioned above. These 12 core interventions are based on evidence from the experiences gained over the past 20 years to promote the RUD ever since the definition of RUD was first formulated in Nairobi in 1985. Much of this evidence was presented at the two international conferences on improving the use of drugs held in Thailand in 1997 and 2004. Data from the WHO Technical Cooperation for Essential Drugs and Traditional Medicine database of the pharmaceutical situation surveyed in 146 WHO Member States through a questionnaire in 2003. Unfortunately, it can be seen that many of the policies recommended by WHO are not being implemented.

Without appropriate policies, it will be very difficult to achieve RUD through education alone because of all the other conflicting messages and incentives generated in health care systems through inappropriate activities (WHO, 2006).

The medical practitioners have wide scope and responsibility too in promoting RUD for better health care. Educational strategies to health care practitioners and consumers have been proved successful model for promoting RUD. One of the educational strategies is to train the medical students of different levels on RUD. The concept and usefulness of RUD need to be the part of the curriculum. A WHO manual “Guide to Good Prescribing: a

Practical Manual" is a useful publication for under graduate and post graduate students is a welcome step in this endeavor (WHO, 2001).

2.2.4 EDL or local formulary Concept

The Alma-Ata declaration during the International Conference on Primary Health Care in 1978 reaffirms that health is a fundamental human right and the attainment of the highest possible level of health is a most important worldwide social goal. The Alma Ata declaration has outlined the eight essential components of primary health care and provision of essential drugs is one of them (Taylor, 2003). WHO introduced the concept of essential drugs in 1977 (WHO, 2002b). Essential drugs are those that satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. Essential drugs are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford. The implementation of the concept of essential drugs is intended to be flexible and adaptable to many different situations; exactly which drugs are regarded as essential remains a national responsibility. Experience has shown that careful selection of a limited range of essential drugs results in a higher quality of care, better management of drugs (including improved quality of prescribed drugs), and a more cost-effective use of available health resources. The WHO has developed the first EDL in 1977 and since then the list has been revised every 2 years. The current one is the 21st model list released in June 2019 (WHO, 2019). The EDL or local formulary contains limited cost-effective and safe drugs, while the open pharmaceutical market is flooded with large number of drugs many of which are of doubtful value. The model list of WHO serves as a guide for the development of national and institutional EDL or local formulary. The concept of essential drugs has been worldwide accepted as a powerful tool to promote health equity and its impact is remarkable as the essential drugs are proved to be one of the most cost-effective elements in health care.

2.2.5 RUD benefits

The reasons for use of irrational drugs or combined products included easy availability without prescription; ignorance of harmful effects; misleading advertisements; and attractive incentives for marketing and/or prescribing. The public should be educated about the harmful effects of drugs, and especially of self-medication. More emphasis is needed on preventative aspects of health rather than curative ones. Availability of drug information to all practitioners from independent sources and periodic audit of prescriptions may help to curb misuse of drugs. Medical associations should urge government to ban harmful drugs and irrational combinations, and request a secure supply of essential drugs. Irrational drug use leads to reduction in the quality of drug therapy, wastage of resources, increased treatment cost, increased risk for adverse drug reactions, and emergence of drug resistance (Bhartiy, Shinde, Nandeshwar et al., 2008)

2.2.6 Irrational use of drugs consequences

2.2.6.1 Risk of antibiotic resistance

The prevalence of infections caused by antibiotic-resistant pathogens is escalating globally and cause infections associated with greater mortality and morbidity (Davey, Brown, Charani et al., 2013). Despite strenuous efforts to control antibiotic usage and to promote optimal prescribing, practitioners continue to prescribe excessively and inappropriately; it is estimated that up to 50% of antibiotic usage in hospitals is inappropriate (Davey, Brown, Charani et al., 2013). Antibiotic resistance has a substantial economic impact because of the need for more expensive second-line drugs and longer hospital stays associated with therapy failure (McGowan Jr, 2001). Some studies suggest a relation between resistance rates and the volume of antibiotic use (Lopez-Lozano, Monnet, Yagüe et al., 2000; Tacconelli, 2009). Also, other studies reported antibiotics overprescribing, in Bangladesh 55.57 % of the doctors prescribe antibiotics in suspected infection while only 33.46 % of them prescribe antibiotics in confirmed cases (Hasan, Hossain, Akter et al., 2009). These results are similar in other studies done in some neighboring Arab countries in the Middle East and gulf countries, Syria, Jordan, U.A.E, Yemen and Sudan, where over use of antibiotics was the most common drug use problem in these countries. Percentage of prescriptions containing antibiotics in Syria, Jordan were 45% ,55% (Lewis), in U.A.E 31.1% (Rasool, Fahmy, Abu-Gharbieh et al., 2010), in Yemen 64.5% (Bashrahil, 2010). Additionally, Ethiopia 58.1% (Desalegn, 2012), 47% in Lao (Keohavong, Syhakhang,

Sengaloundeth et al., 2006) and 58% in the Islamic Republic of Iran (Cheraghali, Nikfar, Behmanesh et al., 2004) have the same overuse antibiotics problem. In the GG recent studies showed the same common problem ether in UNRWA clinics 32.9% (Baba, 2012) or in the governmental PHC in the GG 67.5% (Ayoub, Musalam & Mahadi, 2017).

In addition, modelling studies show the value of infection-control practices and restricted use of antibiotics to control meticillin-resistant S aureus in hospitals (Mackenzie, Bruce, Struelens et al., 2007; Aldeyab, Monnet, López-Lozano et al., 2008). Similarly, the quality of both infection-control practices and antibiotic use plays a part in the incidence of C difficile infection (Owens Jr, Donskey, Gaynes et al., 2008; Aldeyab, Harbarth, Vernaz et al., 2009). One way of tackling resistance is to use antibiotics appropriately to prevent and treat infections (Hulscher, Grol, & van der Meer, 2010).

Appropriate antibiotic use in hospitals entails finding a middle road between their potent ability to reduce the mortality and morbidity of patients with infectious diseases and their potentially hazardous effects (ie, serious adverse events, drug interactions, and induction of resistant strains). Unnecessary use of antibiotic agents, and use of the newest, broad-spectrum antibiotics when narrow-spectrum and older agents would suffice can lead to increases in resistance, harm patients, and increase treatment costs. Conversely, unjustified therapy with narrow-spectrum agents that ineffectively treats the causative pathogen can also be detrimental to the patient (Kollef, 2000).

In developed countries antibiotic stewardship programmes are present. The role of these programmes is to strike a balance between the potent ability of antibiotics for individual patients and their potentially hazardous effects. Initiatives to support appropriate antibiotic use are relevant because of its effects on bacterial resistance, clinical outcome, and costs (Hulscher, Grol, & van der Meer, 2010).

The common recommendations is the challenge to reduce inappropriate and excessive antibiotic prescribing, the implication being that antibiotic resistance is largely a consequence of the selective pressures of antibiotic usage and that reducing these pressures by the judicious administration of antibiotics will facilitate a return of susceptible bacteria or, at least, will prevent or slow the pace of the emergence of resistant strains (Davey, Brown, Charani et al., 2013).

2.2.6.2 Wasting of resources

One of the most important duties of health authorities is to ensure the efficacy and cost effectiveness of health care system services. Developing countries have limited budgets specified to health care, therefore they need good planning to provide essential drugs and promote RUD to reduce the cost of health services (Soleymani, Valadkhani, & Dinarvand, 2009).

Appropriate use of drugs is an essential element in achieving quality of health and medical care for patients and the community as a whole (El Mahalli, 2012).

Tackling the issue of irrational drug use is considered to be essential not only to improve healthcare delivery towards ensuring patient safety, but also to allow for optimal utilization of resources. This stems from the fact that as much as 25%–70% of overall health expenditure in developing countries is spent on drugs whereas, around 10% of health expenditure in most high-income countries is consumed by drugs (WHO, 2008a).

The World Bank has also defined RUD as comprising two key principles: (1) the use of drugs according to scientific data on efficacy, safety, and compliance; and (2) the cost-effective use of drugs within the constraints of a given health system (Almarsdóttir & Traulsen, 2005; May, 2008).

The WHO and the World Bank definitions differ in two main areas: (1) the use of scientific data in prescribing, which appears to be more enforced in the Word bank definition; and (2) while the World Bank definition incorporates countries' financial capacity as a consideration in drug use, the WHO advocates for the RUD with the lowest cost wherever possible, irrespective of the particular health system (Almarsdóttir & Traulsen, 2005).

The WHO estimates that the appropriate RUD can result in about 50%–70% cost-efficiency in medicines expenditure (WHO, 2008b).

2.2.7 Availability of local formulary in hospitals

Availability of local formulary is consider as a challenge, lack of systematic procurement, supply and distribution system and poor demand management are all the key reasons for low availability (Aitken, 2005).

In the past, local formulary was typically drawn up by selecting drugs from existing stock lists or formularies. However, it is now generally recommended that the selection of drugs

be based on a list of common conditions and complaints and the treatments of choice (Laing, Hogerzeil, & Ross-Degnan, 2001). local formulary is a natural result of the national STGs. The drugs included in the treatment guidelines for a certain level of health care will constitute the local formulary for that level. Ideally, the two should be developed together. The recommended criteria for the selection of essential drugs are published elsewhere (WHO, 2003b). To prevent conflicts of interest, manufacturers should not be involved in the decision-making process of defining local formulary (Laing, Hogerzeil, & Ross-Degnan, 2001).

Many national EDL indicate the level of use for each drug, e.g. dispensary, health centre, hospital, the leveled local formulary should be revised frequently. The local formulary can be used as the basis for procurement and distribution of drugs, and for developing a national formulary. It can also be used to identify product areas for selective support to the national pharmaceutical industry, for targeted quality assurance, or as a basis for insurance reimbursement. As with clinical guidelines, local formulary must be actively implemented. Implementing local formulary or formulary in hospitals is sometimes perceived as an unnecessary restriction on specialists' freedom to prescribe. Some of these perceptions can be overcome by developing supplementary STGs and local formulary for defined specialist departments. Flexibility can also be increased by reserving a certain percentage of the hospital drug budget for nonformulary items. However, a budgetary set-aside invites misuse and should be monitored carefully (Laing, Hogerzeil, & Ross-Degnan, 2001).

2.2.8 EDL or local formulary benefits

EDL or local formulary is a limited list of drugs and their properties, intended to guide physicians in their prescribing. Most formularies are issued by institutions (such as hospitals) or by health systems within which physicians work. They are not usually a complete listing of all the drugs available; they present a selection of products, chosen in the light of their merits, their safety and their cost. It follows that a formulary can have a strong influence on physicians' choice of products and their uses (Reynolds, Fajemisin, & Wilds, 2012).

Formularies are the basis of the management and governance systems used to influence the range of drugs available within healthcare organizations. They exist in many primary care organizations and hospitals in the developed world, and within these settings individual departments and General Practices often have their own abbreviated versions tailored to

reflect their specific needs. The extent to which these formularies are managed varies considerably – some are simply descriptive lists (in effect pharmacy stock lists) and others are actively managed and used to complement other strategies for ensuring high quality and cost-effective prescribing. Most individual prescribers have their own informal repertoire of drugs with which they feel comfortable, at least insofar as they are familiar with the dosing requirements and the likely common side effects. Straying outside one's usual area of prescribing competence is associated with a high risk of error and so having a 'preferred list of drugs' reinforces familiarity and competence in their use. One of the major advantages of having EDL or local formulary is that it becomes possible to make changes rapidly as new information becomes available. When new pharmaceuticals are launched and marketed, trends in prescribing (particularly in primary care) can be picked up and new agents or indications can be assessed and formulary choice can be reviewed, regarding cost effectiveness, Drug formularies have a major role in the containment of cost within a healthcare setting. In secondary care the agreed formulary list is in effect the list of drugs available as pharmacy stock and as a consequence prescribing off formulary is difficult and the process of obtaining non-formulary drugs is usually well managed (Reynolds, Fajemisin, & Wilds, 2012).

Essential use of drugs is perhaps the most cost-effective element of public health after immunizations and key health promotion habits such as regular exercise. Safe, effective drugs of good quality that are appropriately used already save millions of lives each year and prevent untold suffering. Much has been achieved since the first WHO model list of essential drugs was drawn up. Fairer financing, affordable prices, rational selection and use, effective drug regulation, and efficient supply systems are all central to closing the gap between those who today benefit from essential drugs and those who do not (Quick, Hogerzeil, Velásquez et al., 2002).

2.2.9 EDL in Palestine

The Palestinian MOH established the first Palestinian National Drug Policy in 1996. This was followed by the preparation of the EDL in the year 2000. Since then, several initiatives were undertaken by the MOH and some local NGOs such as Union of Palestinian Medical Relief Committees. Health Work Committees and the Palestinian Red Crescent Society to implement actively of the EDL and to help promote the concepts and practices of RUD. Unfortunately, other NGOs and the private sector were excluded from such schemes.

UNRWA, on the other hand, has its own EDL and implements its policies accordingly (Khatib, Daoud, & Mataria, 2004). Every PNGOs has their own local formulary. Procurement and selling polices differ between the various PNGOs, where patients pay higher prices for the medications prescribed than for those available at the MOH but lower than for those prescribed at the private sector. The impact of these initiatives, however, on RUD has not been fully evaluated, largely because of the prevailing unstable political situation (Khatib, Daoud, Abu-Rmeileh et al., 2008).

2.2.10 National Drug Policies

The promotion of RUD and the preparation and implementation of local formulary are amongst the most frequently addressed key-issues in the National Drug Policies (NDP), which are proven critical steps in the process of reforming any health system. The national policy becomes the expression of government commitment to a common goal and a framework for action (H. Hogerzeil, 2004). To ensure an adequate supply of safe and effective drugs of good quality, NDP should be incorporated into the national health policy. Elements of NDP include: identification of therapeutic needs; objective selection of essential drugs; drug supply and distribution system; effective legislation and regulation; quality assurance; manpower development; and dissemination of drug-related information. Drug availability does not ensure their rational prescribing or dispensing or appropriate patient use. It is proposed that a flexible multi-disciplinary curriculum be established for healthcare professionals and students and public policy formulators to provide instruction in NDP elements and the principles of RUD. Such courses may stimulate multi-disciplinary drug-related scholarly activities (Laing, Hogerzeil, & Ross-Degnan, 2001).

The Palestinian MOH established the first Palestinian National Drug Policy in 1996. This was followed by the preparation of the local formulary in the year 2000. The underlying objective in these policies has emphasized *"ensuring that safe and effective drugs are available to the entire population at affordable prices and those drugs of good quality are used rationally"* (Khatib, Daoud, & Mataria, 2004).

2.2.11 National Standard Treatment Guidelines (STGs)

STGs called also clinical policies, treatment protocols or best-practice guidelines, structured approaches to diagnosis and therapy have considerable potential to promote RUD. Guidelines vary in complexity from simple algorithms to detailed protocols that include diagnostic criteria, investigations needed, patient advice, and cost information. The

success of guidelines in changing practice seems to depend on many factors, including: the complexity of the targeted practice; the credibility of the group developing the guidelines; involvement of end-users in the development process; the format of the resulting guidelines; and, most importantly, how they are disseminated. In a number of settings where STGs have been developed by an expert committee and simply sent out to health workers, no impact has occurred (Laing, Hogerzeil, & Ross-Degnan, 2001).

Improving the use of drugs through STGs requires both initial work and continuous effort. It is now generally accepted that STGs in developing countries should be developed for each level of care, based on the prevalent morbidities and the competency of available prescribers (physician, nurse, medical assistant, community worker). Substantial involvement and consultation of end-users helps to ensure the practicality of diagnostic and treatment recommendations, and the acceptability of guideline content and format. As far as possible, the selection of treatments should be evidence-based and take into account local economic realities. When completed, the STGs should be introduced through an official launch combined with an intensive training programme. Supervision and further training should reinforce their use. In a study from Uganda by Kafuko and others, provision of STGs alone was compared with facilities receiving either training alone or training plus supervision. Statistically significant improvements were obtained for reducing the number of drugs prescribed, injection use and increasing generic drug use. Compliance with recommended guidelines was significantly improved for malaria and diarrhoea. Improvements in consultation and dispensing times and in adequacy of drug labelling were also observed. When the two intervention groups were compared, improvements were somewhat greater in the combined (training and supervision) group, though this was not always statistically significant.

To be realistic, STGs must be time-limited and open for regular revision. STGs will gain greater acceptance if the focus is put on improving the quality of care, rather than simply reducing cost. National STG manuals should be consistent with treatment guidelines issued by national disease programmes, such as malaria, diarrhoea, tuberculosis and sexually transmitted diseases control. The first edition of the STGs should be reviewed after 1 year, as there are usually errors, omissions or ambiguities; after that, the revision interval can be 2–3 years. Once they are finalized, STGs should be used for pre-service training and examinations; in-service training; as a basis for supervision and audit; and for developing a list of essential drugs (Laing, Hogerzeil, & Ross-Degnan, 2001).

National STGs for the most common illnesses are produced/endorsed by the MOH in Palestine. These were last updated in 2004. Specific STGs cover primary care (updated in 2004). A mechanism aligning the local formulary with the STGs is not in place (Shahin, 2011).

2.2.12 Drug therapeutic committee (DTC)

Drug Therapeutics Committees (DTC) are a forum to bring together all stakeholders (prescribers and financial mangers) involved in decisions about drug use; they may exist at any level within the health-care system (Holloway & Green, 2003).

The beneficial effect of DTCs in monitoring and promoting quality use of drugs and containing costs in hospital and other institutional settings has been generally accepted in developed countries. Unfortunately, there has been little critical evaluation of the clinical or economic impacts of this approach in developing countries. Some inefficiencies result from lack of an effective forum that brings together pharmacists, clinicians and administrators to balance the demand for quality care with financial constraints. There may be tension between prescribers and financial managers about which drugs should be available for what problems. In developed countries hospital DTC have been shown to be very effective in safeguarding and promoting efficient and RUD (Holloway & Green, 2003).

Despite the lack of evidence from developing countries, we nevertheless recommend that DTCs should be established in each hospital. This action will require both policy direction and institutional support (Laing, Hogerzeil, & Ross-Degnan, 2001).

Two essential tasks of a DTC are to develop and revise institutional STGs (usually adapted from national guidelines), and to maintain an institutional EDL or formulary. The DTC can also perform drug utilization reviews, using drug consumption data or simple prescription surveys, and establish systems for audit of patient records, peer-review and continuing education. Antibiotic utilization and infection control are two cross-cutting topics that can serve as a focus for DTC activities. While computerized databases may not exist in developing countries, hospital clinical and pharmacy records can be manually reviewed for audit and feedback. Operations research is needed in both public and private hospitals in developing countries to determine how DTCs can function most effectively (Laing, Hogerzeil, & Ross-Degnan, 2001).

If DTCs do not exist in a country, the Ministry of Health should require that they be established, at least in large hospitals. Materials to assist the committees in their initial phase may need to be developed. Publication in national journals of the results of establishing DTCs and of the success of specific approaches may help other committees to get started (Laing, Hogerzeil, & Ross-Degnan, 2001).

In the Palestinian context, DTC is considered as advisory group composed of experts. It has two levels: a central committee concerned with national drug decisions between alternatives and composed mainly of physicians and pharmacists of different specialties, while hospital level committee composed primarily of physicians, pharmacists, and may include nurse and lab technicians. In hospitals, DTC serves as the communication link between the medical staff and the pharmacy department. Its primary goal is cost containment, and priority setting in case of drug shortage (Al-khodary, 2016).

2.2.13 Prescriber knowledge and attitude about EDL or local formulary

Regarding prescriber attitude, Dutch study conducted by Karbach and Colleagues (2011), 40% of the physicians know the guidelines adequately; however, the study concluded that physicians' knowledge of guidelines does not in itself lead to better guideline implementation. Moreover, Ossoff and Thomason (2011) found that there is no one compliance program model to fit every organization, so there is no one educational model that could fit every organization. There are key factors to consider when determining how to approach an educational program for any organization.

With regard to demographic characteristic of physicians, Sherman (2011) found that no significant demographic differences were reported between different American physician groups, including age, sex, and race, and concluded that Physician-specific factors have no impact on medication prescribing compliance with treatment and clinical outcomes.

In the GG, knowledge level of the prescribers had been studied in MOH PHC clinics and hospitals and other studies had been conducted in UNRWA PHC clinics. These studies illustrated that most of the study participants are aware of the existence of EDL (Fattouh & Hamad, 2010; Baba, 2012; Al-khodary, 2016).

Regarding prescriber knowledge, a study conducted in a Southern Ethiopian hospital, 72.2% of physicians were aware of the existence of the EDL (Mariam, Raghavendra, & Bobasa, 2015). While in Kenya another study conducted and found that 80% of the study Participants at the Alexandrian primary health care centers informed that they have copies

of EDL (Mulwa, Osanjo, Ndwigah et al., 2015). In South India, a study conducted at tertiary care teaching hospital, 75.3% of physicians agreed that generic drugs are as safe as innovator drugs, 64.4% of physicians agree that generic drugs are as effective as brand-name drugs, 63% of physicians said that they prescribe generic drugs, and 89% of physicians agreed that that there should be training programs to increase the awareness regarding generic drugs among doctors (Gupta, Nayak, & Vidyarthi, 2015). In Sri Lanka, the researcher studied the Knowledge in core Policies of EDL among medical practitioners in comparison with medical students in Sri Lanka, only 54% of the study participants have true Knowledge on core policies of EDL, physicians level of knowledge on time frame for revision of EDL was very low (17%), the level of knowledge of physicians on contents of EDL was 63%, the knowledge of physicians about the criteria for selection of EDL was 83% (Hettihewa & Jayarathna, 2010). In Bangladesh, a research conducted regarding the rational prescribing among medical practitioners, 58.6% of the physicians reported that they did not have any clinical practice guidelines in their clinics (Khan & Ara, 2011).

2.2.14 Prescribing pattern

The word prescribe comes from a Latin word meaning to write in advance [of giving a drug]. But the actual writing is a late event in the prescribing process. (J. K. Aronson, Henderson, Webb et al., 2006). Prescribing most commonly defined as the five rights, is that of 'giving the right drug, in the right dose, by the right route of administration, at the right time, to the right patient. But this omits some other important features. Another definition can be more precise is 'A written order, which includes detailed instructions of what drugs should be given to whom, in what formulation and dose, by what route, when, how frequently, and for how long; it initiates an experiment in which the prescriber discusses the treatment with the patient and investigates and monitors the effects of the prescribed drug, with the aim of devising a dosage regimen that maximizes the beneficial effects and minimizes the risk of harms (J. Aronson, 2006). In writing prescriptions, A search of Pubmed using the term "safe prescribing" yields only 36 hits, and none explicitly defines the term. Some imply that safe prescribing is the avoidance of medication errors or adverse drug reactions (Wong & Rawlins, 2000; Hick, Deady, Wright et al., 2001).

Unsuccessful prescribing takes several forms: under prescribing, overprescribing, inappropriate prescribing, irrational prescribing, and prescribing errors (J. K. Aronson, Henderson, Webb et al., 2006).

Prescribing must be preceded by a number of other processes. First, the diagnosis must be accurately made and underpinned by an understanding of the basic pathophysiology. If a drug is not appropriately matched to the pathophysiology of the disease the wrong choice may be made. Secondly, the prescriber must assess the balance of benefit to harm of a particular form of treatment (i.e. whether to treat at all). Thirdly, practical matters related to the choice of drug must be addressed; these include picking the right drug from a range of alternatives, designing the dosage regimen, considering the susceptibilities of a patient that might lead to adverse drug reactions, and remembering possible interactions with other drugs, including herbal formulations, and foods. Lastly, the prescriber and patient need to discuss the proposed treatment and its potential effects, both beneficial and adverse, and the need for careful monitoring and dosage adjustment (J. K. Aronson, Henderson, Webb et al., 2006).

Compliance with EDL needs a specialized medical staff who believes that EDL will improve the services more than other drugs (WHO, 2002a). The three main sources of information about the prescribing patterns of physicians are marketing research data, studies of general practice and monitoring of prescribing in hospitals. These sources show that prescribing patterns vary greatly among physicians according to their place and type of practice and the community in which they prescribe. Also, the clinical experience and trainings were the most important factors in their prescribing habits (J. K. Aronson, Henderson, Webb et al., 2006).

According to WHO guidelines, the medical staff should have adequate knowledge and training in the health care service they provide. The medical staff attitude towards prescribing drugs from the local formulary will affect their compliance with it and the service they provide. More than 50% of the inappropriate therapy shows that prescribers are not up to date with the progress in medical field and should be more responsible (Amin, Khan, Azam et al., 2011)

WHO recommended groups of indicators to describe the drug use situation in any health facility by measuring specific aspects of the behavior of health providers in health facilities in a reproducible manner. The indicators can be quickly and efficiently used in many settings to assess potential problems in drug use, and to prioritize and focus subsequent efforts to correct these problems. In this study, the researcher will study two groups of core indicators of performance in two general areas related to the RUD in the NGHs which are prescribing indicators and health facility indicators. Prescribing indicators group consist of:

1. Average number of drugs per encounter.
1 Percentage of drugs prescribed by generic name.
2 Percentage of encounters with an antibiotic prescribed.
3 Percentage of encounters with an injection prescribed.
4 Percentage of drugs prescribed from essential drugs list or formulary.

While the health facility indicators consist of:

1. Availability of copy of essential drugs list or formulary
2. Availability of key drugs

And the complementary indicators consist of:

1. Average drug costs per encounter.
2. Percentage of drug costs spent on antibiotics.

2.2.15 Prescribing in the NGHs

Most efforts at improving drug use have focused on the public sector, particularly at the primary care level. The private sector frequently provides better access to pharmaceuticals for the general public than does the public sector, although there tends to be an urban focus (Walley & Wright, 2010). Yet, the private sector has unfortunately been neglected by public policymakers. To change practices in the private sector, it is important that policy-makers understand the motivations of private providers. Public servants frequently perceive that private practitioners are purely interested in profit rather than in the quality of their practice. However, recent experiences have shown this perception to be an oversimplification. Generally, all practitioners are interested in their status as health professionals, and their position within the community. Professional associations, with a majority of their membership in the private sector, are often willing to establish programmes to improve the skills or knowledge of their members. Considerable opportunities exist for improving drug use through better licensing and inspection (Bigdeli, Peters, Wagner et al., 2014). Finally, controls on advertising and regulations regarding unethical promotion of drugs can be implemented by national governments and institutional administrators. To stimulate long-term improvements in drug use in the private sector, a range of strategies should be considered. Licensing of practitioners and premises is traditionally used by governments to regulate the private sector. When possible, enforcement of these regulations should not be simply punitive, but combined

with positive efforts to improve performance. Encouraging professional associations to provide an accreditation system and continuing education programmes has many benefits. Changing the way governments or insurance companies reimburse drug expenditures may also have positive effects on drug use (Laing, Hogerzeil, & Ross-Degnan, 2001).

2.2.16 Prescribing writing skills

The drug prescription and administration process in most hospitals worldwide is still based on handwritten medical chart entries (Bobb, Gleason, Husch et al., 2004). Proper prescription writing, which is an essential skill for medical practitioners, is the primary intervention that doctors offer to the suffering humanity (Maxwell & Walley, 2003). Any error in writing a proper prescription leads to prescription errors which in turn lead to medication errors (Nagesh, Umesh, & Gv, 2014). Several steps in this complex and unchecked process can engender a high number of relevant errors which may be a significant source of adverse drug events (Barber, Rawlins, & Franklin, 2003). Certain elements must be written legibly, accurately and completely on the prescription order; these include the physician's name, stamp, specialty and signature, as well as the patient's name, address, age, and the date of the prescription, drug name (preferably generic), formulation, strength, dose, frequency of administration, quantity and directions for use in the patient's language (Williams & Kim, 2005). The illegibility, incompleteness, or omission of any of these elements could result in misinterpretation of the prescription by the dispenser, and may lead to potentially serious prescription errors (Meyer, 2000). Because the art of prescription-writing is not sufficiently addressed in undergraduate medical education, many physicians do not have appropriate prescription-writing skills (Maxwell & Walley, 2003) .

The prescription writing skills involved name, address, telephone of prescriber, date, generic name of the drug, strength, dosage form, total amount, label instructions, warnings, name, address, age of patient and signature or initials of prescriber (Williams & Kim, 2005).

2.2.17 Drug supply and availability

In some countries, government health services are able to ensure access to drugs for a large portion of the population. But in most countries the private sector predominates. High prices and inadequate consumer information limit access to affordable essential drugs. At the same time, government health services face financial pressures and other constraints

(WHO, 1996). Therefore, drug shortage is a global problem, with different reasons mainly related to production and quality issues, or delaying and discontinuations (FDA, 2017).

Regarding donation, in most cases the individuals and organizations involved see donations as tangible expressions of concern and solidarity with people in need. But despite good intentions, experience over the years shows that some drug donations can be more harmful than helpful. They may not be relevant for the emergency situation, for the disease pattern or for the level of care that is available; they may even be dangerous. They may be unknown to local health professionals and patients and may not comply with local drug policies or standard treatment guidelines. Many donated drugs arrive unsorted, or without an international nonproprietary (generic) name on the label. When this occurs, scarce resources are wasted and people in need continue to suffer (WHO, 1996).

In Palestine, the political and contextual situation imposes different conditions represented by the Israeli occupation constrains. In the GG particularly, the long-lasting siege that had begun in 2000 and more tightened since 2006 after internal conflict had increased the suffering. Moreover, the financial crises of the PA -that is responsible for purchasing of drugs for governmental facilities- had aggravated the situations, in addition to the aggressive Israeli attacks on the GG in 2008/09, 2012, and 2014 which severely worsened the impact of all these conditions on social and economic sides, as well as on the health status of the citizens in the GG (Health cluster, 2014). During these circumstances, the issue of chronic essential drug shortages at MOH facilities appeared to be raised and escalated over the past 7 years with a highest percentage of zero stock in 2012 reaching 58% in drugs (WHO, 2012c).

In case of NGOs, several NGOs base their drug distribution activities on their own restricted drug list. For their drug supply, they tend to rely on donations from international NGOs and other organizations. If the Drug donations are done without well organization and corporations with NGOs, governments or individuals, they can cause more problems than benefits are, and entail high transport, storage and destruction costs for the receiving country (van Dijk, Dinant, & Jacobs, 2011). The GG had received drugs as donations which represented the largest proportion of supply (55.8%). In addition, when in need, NGOs buy from local manufacturers and wholesalers. The NGOs and charitable societies generally charge nominal fees for drugs. Reliable data on their drug expenditures are not available and are difficult to obtain, but they are estimated at around US$ 8 million a year (Obeidallah, Mahariq, Barzeq et al., 2000).

2.2.18 Medical education training program

Education and training programs are important component in human resource development department in any organization and it is considered as a capacity building for the staff. Capacity building defined as provision of intellectual capability, physical facilities and supportive work environment to enhanced service delivery. By developing training and education program, the facilities management can standardize the concepts and disseminate the knowledge and update the medical staff information.

Prescribing is a complex and challenging task that must be part of a logical deductive process based on accurate and objective information and not an automated action, without critical thinking or a response to commercial pressure. There are worldwide evidences of poor prescribing due to errors, polypharmacy, and inappropriate or irrational prescribing (Patrício, Alves, Arenales et al., 2012). When drugs are prescribed or used erroneously, they pose serious health risks to the patient and significant associated economic implications (WHO, 1995, 2010c).

Factors responsible for poor prescribing have been identified, such as deficiency of training, failure to perceive the importance of the task, lack of identifying the errors, and increasingly therapeutic options (Weingart, Wilson, Gibberd et al., 2000; Barber, Rawlins, & Franklin, 2003). Reports from medical students show they do not feel prepared to prescribe (Pearson, Rolfe, & Smith, 2002; Coombes, Mitchell, & Stowasser, 2008). First-year doctors are neither confident nor competent in writing a prescription corroborating the lack of undergraduate and postgraduate education in prescribing (Lempp, Seabrook, Cochrane et al., 2005; Heaton, Webb, & Maxwell, 2008).

To overcome these difficulties, the WHO produced the Guide to Good Prescribing which takes the medical student through a structured problem-solved six-step process in choosing and prescribing a suitable drug for an individual patient. The WHO's Guide is based on the concept of RUD which requires patients to receive appropriate medications for their clinical needs, in proper individual doses for the correct period of time at a low cost for them and the community (WHO, 1995, 2002a, 2010c, 2014).

In prescribing a treatment, the doctor can choose between drug therapy, a combination of drug and non-drug therapy or only a non-drug approach. In the case of a drug based therapy using RUD is essential since it is a process that involves decisions made based on the efficacy, safety, convenience and cost. Furthermore, the correct prescription with the

guarantee of access to the prescribed medication and adequate dispensing followed by the proper use by the patient is also part of the RUM principal. (WHO, 1995).

Considering the deficiency showed by young doctors in prescribing efficiently, in 2003 the RUD teaching was included in the official curriculum of the Botucatu School of Medicine, Brazil, as a mandatory discipline taught over a total of 24 hours, during one semester of the academic year. This discipline, based on the WHO's Good Prescribing Guide, trains students to learn a logical deductive process for selecting drugs according to the RUD principles (i.e., efficacy, safety, convenience and cost) and to write a correct prescription (Kar, Pradhan, & Mohanta, 2010).

The medical practitioners need to keep themselves updated through attending seminars, conferences, and other continuing professional development programmes. These programmes should not be supported by pharmaceutical industries, as often there is conflict of interest. They should look for independent publications or drug information centers for drug-related information, but not from the medical representatives. The hospital formulary is a good source of information. The essential drugs should be the first choice during medical practice. Finally, they should take care of their clients, the patients, by spending some time with them explaining the appropriate use of prescribed drugs. The patients should be accepted as the partner in drug therapy prescribing (Kar, Pradhan, & Mohanta, 2010).

For the implementation of regular updating about EDL and training programs in the GG, during the last 13 consecutive years, MOH did not implement training programs for physicians on the concept and content of the EDL and did not implement training about EDL related topics in the training programs for newly recruited physicians thus lead to lack of knowledge about EDL and regular updating for the MOH physicians (Al-khodary, 2016).

In the GG, several studies illustrated that healthcare staff in UNRWA and MOH need to implement a continuous education and training programs for healthcare staff concerning EDL and treatment protocols (Baba, 2012; Al-khodary, 2016) while no information about local formulary knowledge for NGOs healthcare staff provided, this kind of information covered during this study.

2.2.19 MOH Monitoring and evaluation system

Palestinian NGHs suffer from Lack of financial resources for this reason the auditing system become very important. A study was undertaken in MOH about the internal audit which showed moderately experience in auditing field and few of the auditors have a professional certificate Arab Certified Professional Accountant (ACPA) so MOH at the GG must highly focus on internal auditing function to control activities , and enhance work in the MOH (Azzam, 2015). In addition, the MOH role in monitoring and evaluation is critical and crucial in saving resources and producing figures and indicators to have overview about the current situation. Pharmaceutical policy implementation is not regularly monitored/assessed (Shahin, 2011). Regarding MoH annual report 2018 of Unit of Licensing & Accreditation (UAL) the unite responsibilities summarized in; issuing a license to practice a profession; issuing and check health facilities license including PNGHs and follow up the technical and administrative matters; confiscating medical samples, contagious drugs, illegal and expired medical materials and solutions and following up the companies and warehouses supplied them, warning citizens to deal with them through the unit's website, follow up complaints, attending and sharing in MOH committees, workshops and trainings, inspection if all the working medical staff within the facility employee list and finally, the extent to which the quality standards are applied (UAL-MOH, 2018).

2.2.20 Health facility auditing and monitoring system

Monitoring system in the hospitals can include the following tasks: compliance with education & training, screening of employee applicants by making sure that the new employee has the appropriate background to the hire position and perform verification of licensure/certification, all employees have access to help if they need any, availabilities of local drug list copies with prescribers (HCCA, 2005). a study conducted to detect the Audit and Feedback effects on professional practice of physicians, found that Audit and feedback generally leads to small but potentially important improvements in professional practice. The study concluded that the effectiveness of the Audit and feedback system seems to depend on baseline performance and how the feedback is provided (Thomson, Oxman, Davis et al., 2010).

Chapter Three

Methodology

3.1 Study Design

The design of this study is triangulated, analytic, descriptive cross-sectional retrospective one in term of prescribing indicators and prospective in term of health facility indicator. It used to describe the present status of drug description and use in the NGHs in the GG. Those health facilities represented different geographical location, type of care provision and patient load. The cross-sectional design is practical, simple, cheap, easy and enable the researcher to get his objectives in short time (Martins, Zin, & Zin, 2005). In this study, methodological triangulation would provide combination between quantitative (data collect from patient file and self-developed questionnaire) and qualitative paradigms (in depth interviews with key health providers) to get findings that can remove assumptions and replace them with actual data on the specific variables studied during the time period accounted for in the cross-sectional study (study.com, 2017).

3.2 Study Population

The study population consists of two groups:

1. All the patients received the SHC services in the NGHs in the GG.
2. All prescribers in the NGHs in the GG.

3.3 Study Setting

The NGHs in the GG who are provided SHC services which are eleven hospitals **(Table 3.1).**

Table (3.1): The study setting: The NGHs in the GG.

No.	Governorate	NGHs
1	North governorate	Al-Awda Hospital
2	Gaza governorate	Public Aid Hospital
		Al Ahli Arab Hospital
		Patient Friend's Benevolent Society (PFBS) Hospital
		Al-Karama specialized Hospital
		Al-Quds Hospital
		Hayfa charity hospital
3	Middle Area governorate	Yafa Hospital
4	Khan-Younis governorate	Al Amal Hospital
		Dar Al-Salam Hospital
5	Rafah governorate	Kuwait obstetrical and pediatric Hospital

3.4 Study Period

The study started after having the university's approval of the proposal and after obtaining the ethical approval from Helsinki Committee **Annex (1)** and selected NGHs approval **Annex (2)**. Pilot study conducted and then data collection began. The study expected to consume 11 months; it started in August, 2017 and expected to be completed by June 2018. **Annex (3) describes the activities of the research and expected duration for each activity**

3.5 Sampling

3.5.1 Sample calculation

According to WHO manual, the number of health facilities is not less than 20, If fewer facilities are included, a larger number of cases should be selected in each, so that the minimum of 600 encounters is reached. To compare individual facilities at least 100 encounters would be recommended to collect per facility to conduct the study (WHO, 1993).

In this study, the researcher conducted the study in eleven NGHs in the GG. The study focused on three domains in the hospital which were: in-patient discharge sheet, in-patient medication sheet, and out-patient clinic medication sheet. The total encounters were 3960, each hospital provided 360 encounters, the 360 encounters provided from the three mentioned domains in the hospitals, 120 encounters from each domain. By collecting 360 prescription sheets from each selected hospital the researcher could conduct comparison between the selected NGHs in terms of prescribing pattern and health facility indicators.

For the prescribers' questionnaire, the number of the prescribers of each hospital was taken from the manager of each hospital, the sample of the study was a proportional sample and representative for all prescribers working in the NGHs. The sample determined by using the following parameters to calculate the sample size **(Table 3.2):**

a. Maximum acceptable percentage points of error 5%.
b. Confidence level at 95%.
c. Total population (384).
d. Sample size of prescribers is 192, the researcher will take 200 prescribers.

Table (3.2): The total number of physicians working at the study settings and sample size calculation

No.	NGHs	No. of prescribers	Total sample (%)	Sample size
1	**Al Awda**	50	12	25
2	**Al Ahli Arab**	18	4.4	9
3	**Al Amal**	45	11	22
4	**Al-Karama**	28	7	13
5	**Al-Quds**	72	18	35
6	**Dar Al-Salam**	30	7.4	15
7	**Hayfa**	22	5.4	11
8	**Kuwait**	20	5	10
9	**PFBS**	55	13.5	27
10	**Public Aid**	47	11.6	23
11	**Yafa**	20	5	10
Total		**406**	**100%**	**200**

3.5.2 Sampling process

The researcher selected 11 NGHs in the GG which were provided SHC services. The sample as follow; one hospital in the north governorate, six hospitals in the Gaza governorate, one hospital in the Middle Area governorate, two hospitals in Khan-Younis governorate and one hospital in Rafah governorate **(Table 3.3).**

Table (3.3): The distribution of sample size in the selected NGHs

No.	Governorate	NGHs	Discharge sheet	Medication sheet	Out-patient sheet	Total
1	North governorate	**Al-Awda**	120	120	120	360
2	Gaza governorate	**Public Aid**	120	120	120	360
		Al Ahli Arab	120	120	120	360
		PFBS	120	120	120	360
		Al-Karama	120	120	120	360
		Al-Quds	120	120	120	360
		Hayfa	120	120	120	360
3	Middle Area governorate	**Yafa**	120	120	120	360
4	Khan-Younis governorate	**Al-Amal**	120	120	120	360
		Dar Al-Salam	120	120	120	360
5	Rafah governorate	**Kuwait**	120	120	120	360
Total			**1320**	**1320**	**1320**	**3960**

3.6 Eligibility criteria

3.6.1 Inclusion criteria

The study conducted in the five Gaza governorates by selecting eleven NGHs in the GG. The selected NGHs matched the following criteria:

1) Having MOH license.
2) Contains internal and/ or external pharmacy.
3) Providing SHC services.
4) Providing more than one service.

3.6.2 Exclusion criteria

1) Hospital working in physical therapy (rehabilitation).
2) Hospital working in psychological therapy.
3) Hospital working in ophthalmology.
4) Inpatient prescriptions report from units in the selected NGHs provided tertiary health Care services as diagnostic radiology, ophthalmology, obstetrics and gynecology service, neonatal intensive care unit, open heart surgeries, catheterization unit.

3.7 Study instruments

This study utilized WHO data collection forms and self-development encounter forms beside self-developed questionnaire and self-developed observational checklist.

1. Prescribing indicator forms.
2. Facility summary form.
3. Self-developed observational checklist for prescription writing skills.
4. Self-developed hospital key drugs list.
5. Self-developed questionnaire for prescribers.

The researcher used five instruments, the first was the WHO data collection forms which reflected the five quantitative core indicators regarding prescribing practice, two indicators regarding health facility and the complementary indicators (Average drug cost per encounter, the percentage share of each antibiotic, percentage of drug costs spent on antibiotics and the percentage of using of antimicrobials). **Annex (4,5,6) show WHO data collection forms. Annex (7) show Antimicrobial classification for prescribing**

indicators. Annex (8) show facility summary form. The second was self-developed observational checklist for prescribing writing skills. **Annex (9) show self-developed checklist for prescribing writing skills.**

The third was self-developed key drugs list in NGHs in the GG**. Annex (10) show the self-developed hospital key drugs lists in NGH in the GG.** The fourth was self-developed questionnaire for prescribers. **Annex (11) show self-developed questionnaire for prescribers and Annex (12) show list of experts and professional who consulted for the study questionnaire.**

3.8 Data Collection

The researcher and team of two data collectors filled the WHO forms with required data for 12 months ago (June 2016 to June 2017), the data collectors collected 10 prescription sheets each month in different time of the month, this technique of selection and the interval of the study minimized bias due to seasonal variations or interruptions in the drug supply cycle, also permitted equal chances for sample selection and represent various days of the month where the prescription pattern can be affected. Data collection for the 11 selected NGHs needed around four months to finish 3960 prescribing sheets. **Annex (13) describes the actual sample distribution and data collection plan.**

3.9 Data entry and analysis

Data was collected according to WHO data collection formats in order to assess prescribing indicators and facility indicators. The data collection was supervised on a daily basis by the investigators involved in this study. Completeness of the data was checked every day during the data collection period. The data generated for each hospital were entered into a computer using Statistical Package for the Social Sciences (SPSS) version 20.0 software (IBM Corporation, Armonk, NY, USA) to be edited, cleaned, and analyzed. The data were analyzed descriptively and summarized using tables and a bar or Pie chart. Data are presented as simple frequency, mean and standard deviation (SD). The findings were compared and contrasted with other national and international studies.

3.10 Scientific rigor

3.10.1 Validity

The data collection forms regarding prescribing indicators didn't need evaluation by experts to assess its relevance because the researcher used WHO data collection forms which are well tested.

For the self-developed questionnaire regarding prescribers' knowledge, attitude and practice was evaluated by experts to assess its relevance, and their comments were taken in consideration. Also, a pilot study was conducted before the actual data collection to examine data collectors' ability to fill the indicators forms and observational checklist in smooth and good manner, in the other hand, during the pilot study, the researcher examined the prescribers' responses to the questionnaire and how they understand it. This would enhance the validity of the questionnaire after modifying it to be better understood.

3.10.2 Reliability

The following steps done to assure instruments reliability

- Training of data collectors to understanding WHO forms and the meaning of each indicator and how to calculate.
- Then, the data entry in the same day of data collection allow possible interventions to check the data quality or to re-fill the questionnaire when required.
- Re-entry of 5% of the data after finishing data entry assured correct entry procedure and decrease entry errors.

3.11 Pilot study

A pilot study was conducted before the actual data collection started to let the researcher train for data collection, with an aim of improvement of the study validity and reliability, piloting also conducted to identify potential problem areas and deficiencies in the questionnaire, such as the accessibility to participants or records, and to minimize the non-response rate. The pilot study was conducted on 10% of the main study sample. The pilot study sample consisted of 20 physicians worked in Al-Awda hospital.

3.12 Ethical Considerations

During all stages, the researcher was committed to all ethical consideration required to conduct the study. Ethical approval (Helsinki committee approval) was obtained from the

Palestinian health Research Council in Gaza **(Annex 1)**. In addition, an official admin approval was obtained from the nine NGHs (Al-Awda Hospital, Public Aid Hospital, Patient Friend's Benevolent Society Hospital, Al-Karama specialized Hospital, Yafa Hospital, Hayfa charity hospital, Al Amal Hospital, Dar Al-Salam Hospital, Kuwait obstetrical and pediatric Hospital) in the GG **(Annex 2)**. In the same time Al Ahli Arab Hospital and Al-Quds Hospital refused to participate in the research.

3.13 Limitations of the study

- The study included a sample from the NGHs and there are other hospitals working in psychological field or specialized NGHs in one service as ophthalmic hospital were not be included.
- The study focused in only two drug core indicator groups out of three due to the limited time of the study.
- All the questions in the questionnaire are closed-ended which may hinder some important points on knowledge and practice of the participating physicians.
- Two hospitals (Al Ahli Arab Hospital and Al-Quds Hospital) refused to participate in the research.

Chapter Four

Results and Discussion

The study planned to cover all NGHs in the GG which were 11 NGHs in 2017. The GG has 11 NGHs distributed through the five GG to provide healthcare services. Two of the NGHs (Al-Quds Hospital and Al-Ahli Arab Hospital) apologized and refused to participate in the research.

The following chapter explores the statistical analysis of the data and the interpretation of findings. Firstly, presenting statistical analysis data of knowledge, attitude and practice questionnaire were disseminated through physicians in the two mentioned departments (inpatient and outpatient) in the nine participated NGHs. Secondly, the researcher presented the descriptive analysis of the checklist data from the 9 NGHs in the GG which cover two departments; inpatient and out-patient department, inpatient department findings extracted from discharge sheet and medication sheet (admitted cases). From the checklist the researcher can measure the WHO indicators (Prescribing indicators group and the complementary indicators) and assess the drug prescribing practice at the NGHs in the GG. Finally, the researcher presented the data of the health facility indicators group by using WHO approved facility summary form.

4.1 Descriptive analysis of the questionnaires

Out of the total number of collected 200 questionnaires, 198 questionnaires were collected from nine selected NGHs in the GG with response rate 99% **(Table 4.1)**. 23 questionnaires were collected from Al-Amal hospital, which represents 12% of the total sample, 30 out of 32 questionnaires were collected from Al-Awda hospital, which represents 15.2% of the total sample, 18 questionnaires were collected from Al-Karama hospital, which represents 9.1% of the total sample, 19 questionnaires were collected from Dar Al-Salam hospital, which represents 9.6% of the total sample, 15 questionnaires were collected from Hayfa hospital, which represents 7% of the total sample, 13 questionnaires were collected from Kuwait hospital, which represents 6.6% of the total sample, 36 questionnaires were collected from PFBS hospital, which represents 18.2% of the total sample, 31 questionnaires were collected from Public Aid hospital, which represents 15.7% of the total sample and 13 questionnaires were collected from Yafa hospital, which represents 6.6% of the total sample. As shown in **Table (4.1)**

Table (4.1): The total number of physicians working at the study settings and the sample size calculation

No	NGHs	No. of prescribers	Total sample (%)	Sample size
1	Al Amal	35	12	23
2	Al Awda	50	15.2	32
3	Al-Karama	28	9.1	18
4	Dar Al-Salam	30	9.6	19
5	Hayfa	22	7	15
7	Kuwait	20	6.6	13
8	PFBS	55	18.2	36
9	Public Aid	47	15.7	31
10	Yafa	20	6.6	13
Total		**384**	**100%**	**200**

4.1.1 Participants characteristics

4.1.1.1 Socio-demographic characteristics of the study participants

Table (4.2): Socio-demographic characteristics of study participants in the NGHs in the GG (n=198).

Variable	Frequency	Percent
1. Age of participants		
30 years & less	17	8.6%
31-45 years	93	47%
46-60 years	55	27.8%
61 years & more	33	16.7%
Total	**198**	**100%**
Mean = 46.3 SD=11.28		
2. Gender of participants		
Male	177	89.4%
Female	21	10.6%
Total	**198**	**100%**
3. Marital status of participants		
Single	3.5	7%
Widow	2	1.1%
Divorced	1	0.5%
Married	188	94.9%
Total	**198**	**100%**
4. Residency governorates of participants		
North	26	13.1%
Gaza	105	53%
Middle area	16	8.1%
Khan-Yonis	34	17.2%
Rafah	17	8.6%
Total	**198**	**100%**

Regarding the age of participants, as shown in **Table (4.2)**. The overall mean age of the participants was 46.3 years with (SD= 11.28, Range: 47 years), the most common age group was 31-45 years old. About more than half 55.6% of the study participants were younger than 46 years old, while 16.7% of the study participants were older than 60 years old. Regarding gender of study participants, as shown in **Table (4.2)**, the majority 89.4% were male while 10.6% were female **(Figure 4.1)**. Regarding the marital status of the study participants, **Table (4.2)** showed that the majority of the study participants 94.4% were married, 7% single and 1.6% divorced and widow. Regarding the residency of the study participants, **Table (4.2)** showed that 53% of the study participants were residents of the GG; 17.2% were residents of Khan Younis governorate, 13.1% were residents of North, 8.6% were residents of Rafah and 8.1% were residents of middle area

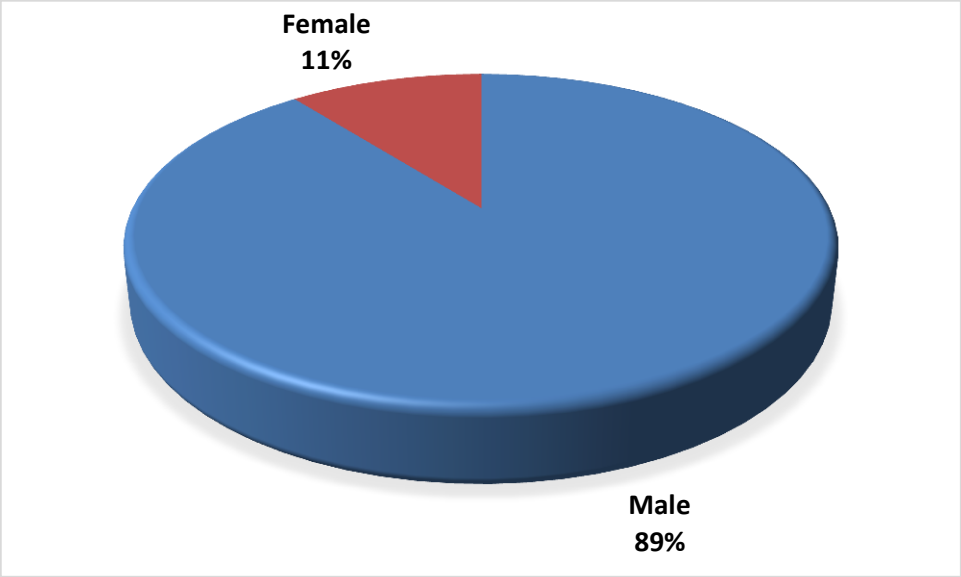

Figure (4.1): Distribution of the study participants by gender

4.1.1.2 Work characteristics of the study participants in the NGHs in the GG

Table (4.3): Work characteristics of the study participants in the NGHs in the GG (n=198)

Variables	Frequency	Percent
1. Academic qualifications		
Bachelor degree BSc.	51	25.8%
Diploma	25	12.6%
Master degree	65	32.8%
Board	46	23.2%
Doctor of Philosophy degree Ph.D	11	5.6%
Total	**198**	**100%**
2. Specialty		
General medicine	39	19.7%
Internal	15	7.6%
Urology	2	1%
General surgery	33	16.7%
Pediatric	19	9.6%
ENT	16	8.1%
Orthopedic department	17	8.6%
Cardiology	8	4%
Obstetrics & gynecology	28	14.1%
Emergency	2	1%
Dental	19	9.6%
Total	**198**	**100%**
3. Job description		
Director of department	6	3%
Head of section	25	12.1%
Head of division	10	5.1%
Hospital director	3	1.5%
Medical director	1	1%
Without	153	77.3%
Total	**198**	**100%**
4. Total years of experience		
Lower than 10 years	48	24.2%
11-20 years	88	44.4%
21-30 years	35	17.7%
31 years and more	27	13.5%
Total	198	100%
Mean=18.97 SD=10.4 Minimum=1 year Maximum=47 years		

As shown in **Table (4.3)**, regarding to the academic qualifications of the study participants, 74.2% of the study participants had postgraduate studies, 32.8% of the study participants had master degree, 23.2% of the study participants had board, 12.6% of the study participants had diploma, 5.6% of the study participants had Doctor of Philosophy degree (Ph.D) and 25.8% had a Bachelor degree.

Regarding to specialty, 19.7% of the study participants were general medicine and 9.6% were dental while most of the study participants 80.3% were specialist. 16.7% had specialty in surgical field, 14.1% of them had specialty Obstetrics and gynecology field, 9.6% of them had specialty in Ear, nose and throat (ENT) field, 9.6% of them had specialty pediatric field, 8.6% of them had specialty in Orthopedic department field, 7.6% of them had specialty in internal medicine field, 4% of them had specialty in Cardiology field, 1% of them had specialty in Emergency field and 1% of them had Urology field.

Regarding job description of the study participants, 77.3% without any managerial position, in contrast, 22.7% with managerial position; 3% of them had a director of department managerial position, 12.1% of them had a head of section managerial position, 5.1% of them had a head of division managerial position, 1.5% of them had a hospital director managerial position and 1% of them had a medical director managerial position.

Regarding the total years of work experience of the study participants in the NGHs, the average years of work experience of the study participants in the NGHs was 18.97 years (with a minimum of 1 years and maximum 47 years, SD=10.4) and this finding are consistent with study participants age and specialty. the most common group of total years of experience 44.4% was 11-20 years followed with age group lower than 11 years with 24.2% and total years of group 21- 30 years with 17.7% finally total years of experience 31 years and more with 13.5%.

4.1.2 Knowledge, Attitude and Practice of physician in the NGHs in the GG

4.1.2.1 Knowledge, Attitude and Practice of physicians in the NGHs in the GG toward local formulary

Table (4.4): Knowledge, Attitude and Practice of physicians in the NGHs in the GG toward local formulary.

Variables	Frequency	Percent
1. Knowledge about the presence of hospital local formulary (n=198)		
Yes	90	45.5%
No	41	20.7%
Don't Know	67	33.8%
Total	**198**	**100%**
2. Participants receive training on local formulary contents (n=90)		
Yes	11	12.2%
No	79	87.8%
Total	**90**	**100%**
3. Local formulary is updated routinely (n=90)		
Yes	62	68.8%
No	6	6.7%
Don't Know	22	24.4%
Total	90	100%
4. Receiving copy of local formulary in the hospital (n=90)		
Yearly	38	42.3%
Every two- years	3	3.3%
Don't have any copy	36	40%
Others	13	14.4%
Total	**90**	**100%**
5. Participation in designing and developing up hospital local formulary (n=90)		
Yes	28	31.1%
No	62	68.9%
Total	90	100%
6. Attendance to refreshing lectures on the local formulary (n=90)		
Yes	13	14.4%
Rarely	16	17.8%
No	61	67.8%
Total	**90**	**100%**

Regarding the study participants knowledge about existence of local formulary in the NGHs, as shown in **Table (4.4)**, 45.5% of the study participants were aware of the existence of hospital local formulary. This finding in the NGHs was approximately close to the awareness level of the physicians in the governmental hospitals in the GG which was just 47.1% (Al-khodary, 2016).

Regarding the results found in knowledge about the existence of local formulary in the NGHs, the study participants who completed the questions related to local formulary concept were 90 out of 198 participants of the study participants. The 90 study participants completed the questions related to the local formulary concept.

Regarding knowledge and practice of physicians towered local formulary in the NGHs in the GG, the 90 out of 198 study participants participated in this group of questions shown in **Table (4.4)**. With respect to the training process on local formulary content and concept, **Table (4.4)** shown that only 12.2% of the study participants received training on local formulary content and concept while, the majority of the study participants (87.8%) did not receive any training on local formulary content and concept. The finding of the study is consistent with the findings of regarding to the training process on local formulary content and concept in Al-Khodary study (87.6%) (Al-khodary, 2016). In fact, regarding to individual interviews was conducted with the NGHs management; no training on local formulary content and concept had been conducted in the selected NGHs through the previous period of time.

Regarding local formulary updating process, **Table (4.4)** showed that 68.8% of study participants know that hospital local formulary updated routinely while 24.4% don't have any idea about updating process in hospital local formulary. Our finding is inconsistent with Al-Khodary study 2016 that showed that the study participants knowledge level about local formulary update process is better than participants knowledge level in the governmental hospitals in the GG (32.5%) (Al-khodary, 2016).

With respect to receiving copy of local formulary in the hospitals, as shown in **Table (4.4)**, the majority of study participants (60%) received local formulary copy in different time manner. 42.2% of the study participants receiving copy of local formulary yearly while 14.4% of study participants received copy of local formulary in irregular time. This finding is inconsistent with Al-Khodary study 2016 that showed 10.7% of the study participants received hospital local formulary copy yearly to the governmental hospitals in the GG (Al-khodary, 2016).

Table (4.4) revealed that more than two thirds of study participants (68.9%) neither involved in designing nor in developing up hospital local formulary. The finding of the study is consistent with the finding of regarding to the designing and developing up hospital local formulary in Al-Khodary study (89.1%) (Al-khodary, 2016).

With respect to the attendance to refreshing lectures on local formulary, **Table (4.4)** shown that the majority of the study participants (85.6%) either never attended nor rarely attended the refreshment lecture on local formulary in the NGH. The low percentage of attendance to refreshing lectures on local formulary emphasizes the low percentage of receiving training on local formulary contents. The finding of the study is consistent with the finding in the governmental hospitals in the GG regarding to attendance to refreshing lectures on local formulary in Al-Khodary study (95.1%) (Al-khodary, 2016).

4.1.2.1.1 Participant's attitude toward local formulary

Table (4.5): Participant's attitude toward local formulary (n=198)

Variable	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Mean % of positive responses
1. local formulary is necessary for provision of quality health services							
No	4	9	13	124	48	3	75%
%	2%	4.5%	6.6%	62.6%	24.2%		
2. local formulary is necessary to reduce wasting of health care resources							
No	3	8	30	115	42	2.9	72.5%
%	1.5%	4%	15.2%	58.1%	21.2%		
3. local formulary is necessary to prevent patient harm							
No	5	18	32	107	36	2.8	70%
%	2.5%	9.1%	16.2%	54%	18.2%		
4. local formulary selection criteria are scientifically based							
No	4	4	46	108	36	2.8	70%
%	2%	2%	23.2%	54.5%	18.2%		
5. local formulary must include the majority of needed drugs							
No	29	77	37	50	5	1.6	40%
%	14.6%	38.9%	18.7%	25.3%	2.5%		
Mean %= 65.5%				**SD=3.35**			

As shown in **Table (4.5)**, there was a positive attitude about the local formulary, the overall mean of the study participant's positive attitude about local formulary was 65.5% (SD= 3.35).

As shown in the **Table (4.5)**, the majority of the study participants (86.8%) were agreed or strongly agreed on the value and necessity of local formulary for provision of quality health services within hospitals. The mean percentage was 75%. Additionally, as shown in the **Table (4.5)**, the majority of the study participants (79.3%) were agreed or strongly agreed that the use of local formulary reduces wasting of health care resources. The mean percentage was 72.5%. Furthermore, as shown in the **Table (4.5)**, 72.2% of the study participants were agreed or strongly agreed that the use of local formulary prevents patient harm, while 11.6% of the study participants disagreed on that. The mean percentage was 70%.

As shown in the **Table (4.5)**, more than two thirds of the study participants (72.2%) were agreed or strongly agreed that the listed drugs in the local formulary are selected on scientific bases, while 23.2% of the study participants were uncertain. The mean percentage was 70%. Moreover, as shown in **Table (4.5)**, more than one half of the study participants (53.5%) revealed that they were disagreed that local formulary must contain the majority of needed drugs for treatment of admitted patients in the hospital while 18.7% of the study participants were uncertain. The mean percentage was 40%. This finding reflects the poor knowledge toward local formulary contents and concept which emphasizes the need of conducting training on local formulary contents and concept as showed in **Table (4.5)**.

The main reasons that could explain limited physicians' knowledge about hospital local formulary in the NGHs are the same in other location as governmental hospitals in the GG which are: (1). Hospital management did not implement training programs for physicians on the concept and content of the local formulary (2). local formulary and other related topics are not included in the educational curriculum of the faculties of medicine in the Palestinian universities; (3). The absence of local formulary related topics in the training programs for newly recruited physicians; and (4). The limited availability hard copies of the local formulary within hospitals (Al-khodary, 2016).

4.1.2.2 Factors related to participant's practices toward prescribing drugs

Table (4.6): Factors related to participant's practices toward prescribing drugs (n=198)

Variables	frequency	Percent
1. Physicians' communication with pharmacists regarding drugs need		
Always	69	34.8%
Rarely	102	51.5%
Don't	27	13.6%
Total	198	100%
2. Participants sources of drugs information		
Hospital Pharmacist	134	67.7%
Medical Re- presentative	2	1%
Internet	51	25.8%
A text book	10	5.1%
Colleague	1	0.5%
Total	198	100%
3. Prescription drugs influence with patient believes		
Always	20	10.1%
Rarely	99	50%
No	79	39.9%
Total	198	100%

Regarding the communication of physicians with hospital pharmacy. **Table (4.6)** shown that, two thirds (65.1%) of the study participants do not communicate with the pharmacists properly or regularly. The finding of the study is consistent with the finding of regarding to physician's communication with hospital pharmacy in Al-Khodary study (78.6%) (Al-khodary, 2016).

Regarding sources of drug information of the study participants, **Table (4.6)** revealed that the study participants do not have a particular source of drug information. The most two common drug information sources were the hospital pharmacists and Internet. Hospital pharmacists indicated by 67.7% of the study participants and Internet indicated by more than one-fourth 25.8% of the study participants. This finding is consistent with Al-Khodary study in the governmental hospitals where the hospital pharmacists and Internet were the

most common drug information source in the GG (Al-khodary, 2016) while the two common drug information sources in UNRWA clinics in the GG were physicians experience and training courses (Saleh, 2008).

Regarding influence physicians with patient desire, believes and expectations in their writing drug prescribing, **Table (4.6)** shown that 60.1% of study participants affected either rarely or always with patient desire, believes and expectations in writing drug prescriptions.

4.1.2.2.1 Participant's practices toward prescribing drugs

Table (4.7): Participant's practices toward prescribing drugs (n=198)

Variable	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Mean % of positive responses
1. Explain treatment to the patient and mention the necessary warnings and instructions							
No	14	58	80	41	5	1.83	45.75%
%	7.1	29.3	40.4	20.7	2.5		
2. Compliance in prescribing drugs from local formulary							
No	4	11	11	108	64	3	75%
%	2	5.6	5.6	54.5	32.3		
3. Using hospital-approved protocols regardless of the latest protocols							
No	14	92	49	40	3	1.62	40.5%
%	7.1	46.5	24.7	20.2	1.5		
4. Drug prescription is based on the drugs available at the hospital pharmacy							
No	1	19	37	11 5	26	2.73	68.25%
%	0.5	9.6	18.7	58.1	13.1		
5. Permanent communication with the pharmacist to find out the available drugs							
No	8	52	41	86	11	2.2	55%
%	4	26.3	20.7	43.4	5.6		
Mean%=56.9 % SD=1.93							

Regarding physicians' practices toward prescribing drugs, as shown in **Table (4.7)**, there was positive practice toward prescribing drugs, the overall mean of the study participant's about local formulary was 56.9% (SD= 1.93).

As shown in the **Table (4.7)**, on practical basis, unexpectedly, less than one third of the study participants (23.2%) agreed about writing warning and instruction during drug prescription while 40.4% of the study participants uncertain. The mean percentage was 45.75%. Furthermore, as shown in the **Table (4.7)**, the majority of the study participants

(86.8%) revealed that they committed to prescribing drugs included in the hospital local formulary during their work in the hospitals. The mean percentage was 75%.

Regarding using hospital-approved protocols regardless of the latest protocols, as shown in **Table (4.7)**, less than one third of the study participants (21.7%) agreed to compliance with treatment protocols approved by the hospital during their work in the hospital while 24.7% uncertain about using the approved treatment protocols in the hospital. The mean percentage was 40.5%.

Additionally, **Table (4.7)** revealed that how many the available drugs in the hospital pharmacy effect on the drug prescription of the study participants, unexpectedly, the majority of the study participants 71.2% agreed that the available drugs in the hospital pharmacy effect in the way of their writing the drug prescriptions. The mean percentage was 68.25%. On the other hands, **Table (4.7)** showed that there is low communication level between physicians and hospital pharmacist, less than one half of the study participants 49% keep good communication channel with hospital pharmacist. The mean percentage was 55%. The remarkable low percentage of physician's permanent communication with the hospital pharmacists to find out the available drugs (49%) is consistence with the findings in **Table (4.6)** that showed low percentage of hospital pharmacists as a source of drug information (67.7%) and with finding of participants communication with hospital pharmacists properly or regularly that showed two thirds of the study participants (65.1%) do not communicate with pharmacists properly or regularly, all these findings reflect the weak communication between physicians and hospital pharmacists.

4.1.2.3 Factors related to physician's knowledge, attitude and practices (KAP) toward the treatment protocols in the NGHs

Table (4.8): Factors related to physician's knowledge, attitude and practices (KAP) toward the treatment protocols in the NGHs

Variables	Frequency	Percent
1. There are treatment protocols in the hospital (n=198)		
Yes	48	24.3%
No	77	38.8%
I don't Know	73	36.9%
Total	**198**	**100%**
2. Treatment protocols location (n=48)		
Hospital Library	2	4.2%
Hospital ward	27	56.3%
Pharmacy	13	27%
Don't know	4	8.3%
Other places	2	4.2%
Total	**48**	**100%**
3. Source of the treatment protocols (n=48)		
Hospital director	11	22.9%
Therapeutics committee in the hospital	16	33.3%
Text book	15	31.3%
I don't know	6	12.5%
Total	**48**	**100%**
4. Treatment protocols matching hospital local formulary (n=48)		
Always	23	47.9%
Rarely	20	41.7%
Don't	5	10.4%
Total	**48**	**100%**
5. Receiving written treatment protocols (n=48)		
Yes	19	39.5%
Rarely or don't	29	60.4%
Total	**48**	**100%**

Regarding factors related to physician's knowledge, attitude and practices (KAP) toward the treatment protocols in the NGHs, **Table (4.8)** shown that only 24.3% of the study participants confirmed the presence of treatment protocols in the hospital. Generally, physician's knowledge level about presence of protocols in the NGHs is lower than physician's knowledge level in the governmental hospitals in the GG (38.1%) (Al-khodary, 2016).

In fact, regarding individual interviews with hospitals managements there is no presence of treatment protocols in the NGHs.

As a result of the question related to the presence of the treatment protocol in the NGHs, only 48 out of 198 of the study participants confirmed the presence of treatment protocols and they were nominated to participate in the following questions which are regarding to the knowledge about the treatment protocols concept in the NGHs.

Regarding treatment protocol location in the hospital, **Table (4.8)** shown that more than one half of the study participants (56.3%) confirmed that protocols location is hospital ward. On the other hand, 8.3% of the study participants don't know the location of the treatment protocols, this finding is inconsistent with Al-Khodary study (2016) that showed low knowledge level to protocols location in the governmental hospitals in the GG (55.8%) (Al-khodary, 2016).

With respect to the source of protocol in the hospital, **Table (4.8)** shown that around one-third of the study participants 33.3% confirmed that the most common source of the treatment protocols is therapeutics committee in the hospital and 31.3% of the study participants confirmed that text book is the second source of the treatment protocols. In fact, regarding to the hospital management, the NGHs don't have neither therapeutics committee as a source for the treatment protocols nor the treatment protocols. Even Al-Awda hospital has therapeutics committee but it not working as a source for the treatment protocols.

Regarding if the Treatment protocols matching hospital local formulary, **Table (4.8)** shown that 47.9% of the study participants confirmed that treatment protocols always matching hospital local formulary.

Regarding receiving physicians written treatment protocol, **Table (4.8)** shown that 39.5% of the study participants confirmed that they receive written treatment protocols although no treatment protocols present in any NGHs as mentioned before.

4.1.2.3.1 Participants attitude toward the treatment protocol in the NGHs

Table (4.9): Participants attitude toward the treatment protocol in the NGHs (n=198)

Variable	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Mean % of positive responses
1. Drugs included in the treatment protocols are effective							
No	7	14	74	94	9	2.42	60.5%
%	3.5	7.1	37.4	47.5	4.5		
2. The treatment protocols are obligatory for participants in the work							
No	5	53	42	80	18	2.26	65.5%
%	2.5	26.8	21.2	40.4	9.1		
3. Compliance with treatment protocols reduce total health cost							
No	5	22	38	111	22	2.62	65.5%
%	2.5	11.1	19.1	56.1	11.1		
4. Local formulary drugs included in the treatment protocols are less effective than others							
No	5	11	45	113	24	2.7	67.5%
%	2.5	5.6	22.7	57.1	12.1		
Mean%= 64.75%					**SD= 2.8**		

As shown in **Table (4.9)**, there was positive attitude toward treatment protocol in the hospital, the overall mean percentage of the study participant's attitude about the current treatment protocol in the hospital was 64.75% (SD= 2.8).

As shown in **Table (4.9)**, more than one-half of the study participants (52%) were agreed that drugs included in the treatment protocols are effective. The mean percentage was 60.5%. Additionally, **Table (4.9)** revealed that 49.5% of the study participants were agreed that the treatment protocols are obligatory for participants in the work. The mean percentage was 65.5%. Moreover, as shown in **Table (4.9),** 67.2% of the study participants were agreed that compliance with treatment protocols reduce total health cost. The mean percentage was 65.5%. Unexpectedly and finally, **Table (4.9)** shown that 69.2% of the study participants were agreed that local formulary drugs are included in the treatment

protocols are less effective than others. The mean percentage was 67.5%. This finding reflects the poor knowledge toward local formulary drugs criteria and the urgent need for the program training for local formulary concept and contents.

4.1.2.4 Participants opinion about hospital management efforts

4.1.2.4.1 Participants opinion about hospital management efforts toward local formulary

Table (4.10): Participants opinion about hospital management efforts toward local formulary (n=90)

Variables	Frequency	Percent
1. Having copy of hospital local formulary		
Paper	29	32.2%
Electronic	9	10%
Paper & Electronic	9	10%
Do not have any copy	43	47.8%
Total	**90**	**100%**
2. Entity responsible for setting up hospital local formulary		
Hospital DTC	33	36.7%
Central DTC	4	4.4%
Hospital pharmacy committee	18	20%
Medical director	1	1.1%
MOH	1	1.1%
External committee	0	0.0%
External & internal committee	1	1.1%
Procurement department	1	1.1%
I don't know	31	34.4%
Total	**90**	**100%**
3. Hospital management encourages physicians to be compliant with local formulary		
Always	24	26.7%
Rarely or Do not	66	73.3%
Total	**90**	**100%**
4. Hospital management arrange training program and lectures on local formulary		
Yes	26	28.9%
No or don't know	64	71.1%
Total	**90**	**100%**
5. Hospital management gives feedback about physicians' compliance with local formulary		
Yes	13	14.4%
Rarely or No	77	85.6%
Total	**90**	**100%**
6. Hospital management takes any action against physicians don't compliance with local formulary		
Yes	15	16.7%
No	36	40%
Don't know	39	43.3%
Total	**90**	**100%**

Regarding hospital management efforts in the NGHs in the GG, the 90 out of 198 study participants participated in this group of questions shown in **Table (4.10)**. With respect to the participants opinion about hospital management efforts, **Table (4.10)** shown that 47.8% of the study participants didn't receive copy of hospital local formulary while 32.2% of the study participants received paper copy of the hospital local formulary. Generally finding in the NGHs toward physician receiving copy of hospital local formulary is better than finding of Al-Khodary study in the governmental hospital in the GG either in receiving any copy or at least having a paper copy (Al-khodary, 2016). Additionally, regarding entity that was responsible for setting up hospital local formulary. As shown in **Table (4.10)**, more than one third of the study participants 36.7% chose hospital DTC which was a correct answer for Al-Awda hospital only. Only 20% of the study participants chose correctly hospital pharmacy committee while 34.4% showed lack of knowledge about the responsible entity for setting up hospital local formulary.

In fact, regarding NGHs managements; hospital pharmacists' committees in all selected NGHs are the responsible entity for setting up hospital local formulary except Al-Awda hospital which has a hospital DTC which consist of specialist physicians and hospital pharmacists.

With respect to the hospital management efforts in encouraging physicians to be compliant with local formulary, **Table (4.10)** shown that 73.3% of the study participants felt that they were not encouraged properly by hospital management to be compliant with local formulary drugs. The finding of the study is consistent with the finding of regarding to hospital management efforts in encouraging physicians to be compliant with local formulary in governmental hospitals in the GG (83.5%) (Al-khodary, 2016).

Regarding arrangement of lecture or training program on local formulary. **Table (4.10)** revealed that 28.9% of the study participants thought that the hospital management arranges lectures or training programs on local formulary in the selected hospitals. While 71.1% didn't think or know if the hospital arranged any lectures or training program on local formulary in the hospital. These findings referred to a gab in communication and updating between the hospital managements and physicians where hospital physicians don't think or know if the hospital managements arranging any lectures or training

program on local formulary concept or contents. In fact, regarding to the NGHs management, all NGHs did not conduct any lecture or training program on local formulary in the selected hospitals. According to Dr. Ahmed Muhanna (Al-Awda hospital director) Al-Awda hospital management replace training on local formulary concept and content with distributing generalizations among physicians about hospital local formulary in regular time.

Table (4.10) illustrated physicians' opinion regarding hospital management efforts in giving feedback about their compliance with local formulary. The study findings showed that physicians had negative perception about the role of the monitoring and evaluation system inside the hospitals to improve compliance with local formulary. As shown in the **Table (4.10)**, the majority of the study participants (85.6%) received appropriate feedback from the hospital management about their compliance with local formulary. The same negative perception about the role of the monitoring and evaluation system inside the NGHs to improve compliance with local formulary found in governmental hospitals in the GG (45%) (Al-khodary, 2016) while the role of the monitoring and evaluation system in UNRWA health centers in the GG was better (Baba, 2012).

Furthermore, **Table (4.10)** indicated the weak role of the hospital management in taking action against physicians who are don't compliance with local formulary, 40% of the study participants indicated that no action was taken against physicians who didn't compliance with local formulary while 43.3% did not have any idea if the hospital took any action against physicians who didn't compliance with local formulary. The finding of the study is not consistent with the finding of regarding to action was taken against physicians who didn't compliance with local formulary in UNRWA health centers in the GG (Baba, 2012).

4.1.2.4.2 Participants opinion toward monitoring efforts in the NGHs

Table (4.11): Participants perception toward monitoring efforts of the hospital management in the NGHs (n=198)

Variable	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Mean % of positive responses
1. There is a monitoring system to measure physician's compliance with local formulary							
No	13	89	60	34	2	1.61	40.25%
%	6.6	44.9	30.3	17.2	1		
2. There is a monitoring system to measure physician's compliance with protocols							
No	16	74	65	38	5	1.7	42.5%
%	8.1	37.4	32.8	19.2	2.5		
3. The current hospital monitoring system is efficient and effective							
No	17	60	70	47	4	1.8	45%
%	8.6	30.3	35.4	23.7	2		
4. Compliance with protocol affect your performance appraisal							
No	11	49	79	51	8	1.97	49.25%
%	5.6	24.7	39.9	25.8	4		
5. Describing unnecessary treatments before they expire							
No	3	37	26	108	24	2.57	64.25%
%	1.5	18.7	13.1	54.5	12.1		
6. There are performance indicators for protocol compliance in the hospitals							
No	12	66	62	53	5	1.86	46.5%
%	6.1	33.3	31.3	26.8	2.5		
7. Periodically provision with a list of available drugs at the hospital pharmacy							
No	21	68	49	54	6	1.92	48%
%	10.6	34.3	24.7	27.3	3		
Mean% = 48% **SD= 4.1**							

As shown in **Table (4.11)**, there was a negative perception toward hospital management efforts related to the monitoring system, the overall mean percentage of the study participant's perception about the current hospital management efforts was 48% (SD= 4.1). As shown in the **Table (4.11)**, the majority of the study participants (81.8%) were either uncertain or declined the existence of monitoring system in the hospital to measure physician's compliance with local formulary drugs. The mean percentage was 40.25%. As shown in **Table (4.11)**, 78.3% of the study participants were either uncertain or declined the presence of monitoring system to assess physician's compliance with the treatment protocols. The mean percentage was 42.5%. As shown in **Table (4.11)**, the majority of the study participants (74.3%) were either uncertain or disagreed on the effectiveness of current hospital Monitoring and Evaluation system. The mean percentage was 45%. Moreover, **Table (4.11)** shown that the majority of the study participants (70.2%) were

either uncertain or disagreed that their compliance with the treatment protocol affects the performance appraisal. The mean percentage was 49.25%.

Table (4.11) shown that the two thirds of the study participants (66.6%) were agreed that they describe unnecessary treatments due to near expire date of the available drugs in the hospital pharmacy, this happen after distribution the near expiry date drugs list that available in the hospital. The mean percentage was 64.25%. This finding is consistence with finding in **Table (4:11)** that showed 71.2% of the study participants agreed that the available drugs in the hospital pharmacy effect in the way of their writing the drug prescriptions. These findings reflected the profit side of the NGHs as well as the rational hospital management efforts in minimizing wasting resources.

Furthermore, as shown in the **Table (4.11)**, 70.7% of the study participants were either uncertain or disagreed on the existence of performance indicators on their compliance with the current treatment protocols. The mean percentage was 46.5%.

Finally, **Table (4.11)** shown that 44.9% of the study participants were disagreed on that hospital management providing list of the current available drugs at the hospital pharmacy. The mean percentage was 48%.

2.1.2.5 Comparison the compliance in prescribing drugs from local formulary by various variable

Table (4.12): Comparison the compliance in prescribing drugs from local formulary by social and work characteristics

Social and work characteristics	Compliance in prescribing drugs from local formulary										X2	Sig.
	Strongly disagree		disagree		neutral		agree		strongly agree			
	n	%	n	%	N	%	n	%	n	%		
1. Gender of the participants												
Male	4	100.0%	9	81.8%	9	81.8%	100	92.6%	55	85.9%	3.778	0.437
Female	0	0.0%	2	18.2%	2	18.2%	8	7.4%	9	14.1%		
Total	4	100%	11	100%	11	100%	108	100%	64	100%		
2. Age of the participants												
30 years & less	0	0.0%	2	18.2%	1	9.1%	12	11.1%	2	3.1%	10.083	0.609
31-45 years	3	75%	5	45.5%	5	45.5%	51	47.2%	29	45.3%		
46-60 years	0	0.0%	3	27.3%	2	18.2%	31	28.7%	19	29.7%		
61 years & more	1	25%	1	9.1%	3	27.3%	14	13%	14	21.9%		
Total	4	100%	11	100%	11	100%	108	100%	64	100%		
3. Total years of experience												
Lower than 10 years	0	0.0%	1	9.1%	1	9.1%	12	11.1%	5	7.8%	10.866	0.540
11-20 years	1	25%	3	27.3%	2	18.2%	13	12%	10	15.6%		
21-30 years	2	50%	5	45.5%	5	45.5%	55	50.9%	21	32.8%		
31 years and more	1	25%	2	18.2%	3	27.3%	28	25.9%	28	43.8%		
Total	4	100%	11	100%	11	100%	108	100%	64	100%		

Chi square test was used to examine the relationship between prescriber's compliance in prescribing drugs from local formulary and prescriber social and work characteristics. As illustrated in **Table (4.12)**, there was no statistically significant relationship between prescriber gender and prescriber's compliance in prescribing drugs from local formulary (Sig.= 0.437). Also, there is no statistically significant relationship between prescriber age and prescriber's compliance in prescribing drugs from local formulary (Sig.=0.609), finally there is no statistically significant relationship between prescriber total years of experience and prescriber's compliance in prescribing drugs from local formulary (Sig.=0.540), so prescribers compliance in prescribing drugs from local formulary was not dependent in prescribers social and work characteristics.

The same results found in Fattouh study were no statistically significant relationship between prescribers social and work characteristics and prescriber's compliance in prescribing drugs from EDL in the governmental PHC (Fattouh, 2005).

Table (4.13): Comparison the compliance in prescribing drugs from local formulary by presence of treatment protocol in the NGHs

Variable	Compliance in prescribing drugs from local formulary										x2	Sig.
	Strongly disagree		disagree		Neutral		agree		strongly agree			
	n	%	n	%	n	%	n	%	n	%		
There is treatment protocol in the hospitals												
No	2	50.0%	5	45.5%	3	30.0%	42	38.9%	26	41.3%	2.970	.936
Yes	1	25.0%	1	9.1%	4	40.0%	25	23.1%	16	25.4%		
I don't know	1	25.0%	5	45.5%	3	30.0%	41	38.0%	21	33.3%		
Total	4	100.0%	11	100.0%	10	100.0%	108	100.0%	63	100.0%		

As shown in **Table (4.13)**, Chi square test was used to examine the relationship between prescriber's compliance in prescribing drugs from local formulary and presence of treatment protocol in the NGHs. As illustrated in **Table (4.13),** there is no statistically significant relationship between compliance in prescribing drugs from local formulary and presence of treatment protocols in the NGHs (Sig= 0.936), so prescribers' compliance in prescribing drugs from local formulary was not dependent in presence of treatment protocols in the NGHs.

2.1.2.6 Comparison the knowledge about the presence of hospital local formulary by various variable

Table (4.14): Comparison the knowledge about the presence of hospital local formulary by social and work characteristics

Social and work characteristics	Knowledge about the presence of hospital local formulary					
	N	Mean	SD	t	F	P-value
1. Gender of the participants						
Male	177	0.85	0.87	-1.422		0.157
Female	21	1.14	0.96			
Total	198					
2. Age of the participants						
30 years & less	17	1.00	0.94		1.010	0.389
31-45 years	93	0.80	0.85			
46-60 years	55	1.04	0.92			
61 years & more	33	0.82	0.882			
Total	198	0.88	0.885			
3. Total years of experience						
Lower than 10 years	48	0.813	0.842		2.016	0.113
11-20 years	88	0.784	0.903			
21-30 years	35	1.200	0.833			
31 years and more	27	0.926	0.917			
Total	198	0.884	0.885			

T-test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of the prescriber's knowledge about the presence of hospital local formulary of the participants in the prescriber gender groups of study. As illustrated in **Table (4.14)**, the gender type does not have statistically significant difference in the mean of prescriber's knowledge about the presence of hospital local formulary (t= -1.422, P value=0.157).

On the other hand, As shown in **Table (4.14)**, the overall mean of age of the participants was 0.88 (SD=0.885). The highest mean of age of the participants was reported at 46-60 years of participant age group (1.04) while the lowest mean of age of the participants was reported at 31-45 years of participant age group (0.80).

One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of the prescriber's knowledge about the presence of hospital local formulary of the participants in the all age groups of study participants. As illustrated in **Table (4.14)**, The age of the study participants was no

statistically significant change in the prescriber's knowledge about the presence of hospital local formulary (F=1.010, P value=0.389).

Additionally, As shown in **Table (4.14)**, the overall mean of total years of experience of the study participants was 0.88 (SD=0.885). The highest mean of total years of experience of the participants was reported at 21-30 years of participant age group (1.200) (SD= 0.833) while the lowest mean of total years of experience of the participants was reported at 11-20 years of participant age group (0.784) (SD= 0.903).

One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of the prescriber's knowledge about the presence of hospital local formulary of the participants in the all total years of experience groups of study participants. As illustrated in **Table (4.14)**, The total years of experience of the study participants has no statistically significant change in the prescriber's knowledge about the presence of hospital local formulary (F=2.016, P value=0.113).

4.2 Descriptive analysis of the checklist

In this part, the researcher identified the degree of physicians' prescription writing compliance to WHO recommendation in prescription writing during their clinical practice.

The new sample of the encounters of the nine NGHs in the GG is illustrated in **Table (4.15).**

Table (4.15): The distribution of collected encounters sample in the selected NGHs

No.	NGHs	No. of out-patient sheet	No. of discharge sheet	No. of medication sheet	Total
1	**Al-Awda**	123	121	121	365
2	**Al Amal**	N.A.*	135	122	257
3	**Al-Karama**	120	120	120	360
4	**Dar Al-Salam**	120	122	42**	242
5	**Hayfa**	124	124	N.A.***	248
6	**Kuwait**	121	121	121	362
7	**PFBS**	120	121	122	363
8	**Public Aid**	134	146	127	407
9	**Yafa**	126	120	123	369
Total		**998**	**1130**	**898**	**3016**

*N.A.: No out-patient sheets available.

**To compare individual facilities, the size of samples drawn within each facility must be at least 100 encounters (WHO, 1993).

*** N.A.: No medication sheets available.

As shown in **Table (4.15)**, the total checklists assessing in the 9 NGHs are 3016 checklists with 360 checklists at least for each hospital except Hayfa hospital with no medication sheets and Al Amal hospital with no out-patient sheets. In Dar Al-Salam hospital the researcher only found 42 medication sheets related to the period of research June 2016 to June 2017. All the in-patient cases in Dar Al-Salam hospital didn't admit due to the high admission cost of hospital regarding to patients, the forty-two cases admission cost covered by international donor "Doctors without borders" because the cases were injured as a result of confrontations with the Israeli army. The results generated from medication sheets in Dar Al-Salam hospital represent only Dar Al-Salam hospital but can't involve in the hospital comparison due to WHO recommendation in WHO manual 1993 which state that to study the basic indicators the sample size drown with each facility is 30 prescribing encounters and to compare individual facilities the sample size drown at least 100 encounters (WHO, 1993).

In Al-Amal hospital the out-patient department related to the MOH not for Palestinian Red Crescent system so the patients don't have any file.

4.2.1 Prescribing indicators group

Table (4.16): Result of drug use indicators in the study

#	Drug use indicator	Result
1.	Average number of drugs per prescription	2.5
2.	Percentage of drug prescribed by generic name	3.3%
3.	Percentage of drug prescribed from local formularies	88.7%
4.	Percentage of encounter with injection	30.2%
5.	Percentage of encounter with antibiotic	67.9%
6.	Encounter cost	10.9 $
7.	Percentage of medicine costs spent on antibiotics	47.14%
8.	Percentage of availability of local formulary	100%
9.	Percentage of availability of key drugs	76.9%

As illustrated in **Table (4.16),** the average number of drugs per encounter was 2.5. whilst the minimum value was 0 the maximum value was 7 (SD=1.072) with a median of 2 drugs per encounter. Meanwhile, the percentage of drugs prescribed by generic name was 3.3%, the minimum found value was 0 while the maximum revealed value was 4 (SD=0.374) and the median was 0. The percentage of drugs prescribed from local formularies was 88.7%, the minimum found value was 0 while the maximum revealed value was 7 (SD=1.144) and the median was 2. On the other hand, the percentage of encounter with injection was 88.7%, the minimum found value was 0 while the maximum revealed value was 1 (SD=0.464) and the median was 0, the percentage of encounter with antibiotic was 67.9%, the minimum found value was 0 while the maximum revealed value was 1 (SD=0.469) and the median was 1.

Additionally, the average encounter cost was 10.9$ and the percentage of medicine costs spent on antibiotics was 47.14%.

Finally, the availability of copy of local formulary was found in all NGHs surveyed. The availability of key drugs was 76.9% and the minimum value was 70.8% meanwhile the maximum value was 100%.

4.2.1.1 Descriptive findings of the prescribing indicators group related to the type of sheet

Table (4.17): Descriptive findings of the prescribing indicators group related to the type of sheet

Variable	Type of sheet	No. of encounter	No. of drugs	No. of drugs/ prescription (Mean)	SD	F	Sig.
Total No. of prescribed drugs	Out-patient sheet	998	2540	2.55	0.964	11.477	0.000*
	Discharge sheet	1130	2889	2.56	0.81		
	Medication sheet	898	2126	2.36	1.407		
	Total	**3016**	**7555**	**2.5**	**1.072**		
No. of prescribed drugs from the local formulary	Out-patient sheet	998	2250	2.25	1.03	14.656	0.000*
	Discharge sheet	1130	2313	2.05	0.992		
	Medication sheet	898	2059	2.29	1.394		
	Total	**3016**	**6622**	**2.2**	**1.144**		
No. of prescribed drugs using generic names	Out-patient sheet	998	56	0.06	0.268	133.157	0.000*
	Discharge sheet	1130	14	0.01	0.111		
	Medication sheet	898	236	0.26	0.58		
	Total	**3016**	**306**	**0.1**	**0.374**		
No. of prescribed encounter with injectable drugs	Out-patient sheet	998	145	0.15	0.354	1699.05	0.000*
	Discharge sheet	1130	57	0.05	0.219		
	Medication sheet	898	746	0.83	0.377		
	Total	**3016**	**948**	**0.34**	**0.464**		
Total No. of prescribed encounter with antibiotic	Out-patient sheet	998	492	0.5	0.5	374.581	0.000*
	Discharge sheet	1130	1064	0.94	0.231		
	Medication sheet	898	473	0.53	0.5		
	Total	**3016**	**2029**	**0.67**	**0.469**		

*Statistically significant

As shown in **Table (4.17)**, the average total number of drugs prescribed in all type of files among the study settings was 2.5 drugs per sheet with drug range from 1-7 drugs per

prescription. The highest number of drugs prescribed was reported at discharge sheet with an average of 2.56 drugs per out-patient sheet, while the lowest number of drugs prescribed was reported at medication sheet with an average of 2.36 drugs per medication sheet. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of the total number of drugs prescribed in all type of sheets. There was a statistically significant difference in the mean number of drugs prescribed in the NGHs sheets among the study settings with (F=11.477, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was reported between out-patient sheet and medication sheet (Sig. =0.000). It seems that physicians in the NGHs tend to prescribe more drugs in out-patient sheets than in the medication sheet, this can be attributed to the positive relationship between number of drugs may be prescribed during patient admission and the admission cost in the hospital Another significant difference was reported between discharge sheet and medication sheet (Sig. =0.000). It seems that physicians in discharge sheet tend to prescribe more drugs than in medication sheet in the NGHs sheets. On the other hand, no significant difference was reported between discharge sheet and out-patient sheet (Sig. =1.000).

Regarding the No. of local formulary drugs prescribed in the NGHs, as shown in **Table (4.17)**, the overall average number of drugs prescribed from the local formulary among the study settings was 2.2 drugs per sheet. The highest number of drugs prescribed from the local formulary was reported in medication sheet with an average of 2.29 drugs per sheet, while the lowest number of drugs prescribed from the local formulary was reported in the discharge sheet with an average of 2.05 drugs per sheet. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean number of local formularies listed drugs prescribed in the study sheets. As shown in **Table (4.17)**, there was a strong statistically significant difference in the mean number of the drugs prescribed from the local formulary in the sheets among the study settings with (F=14.656, P value=0.000). Post Hoc- Bonfirroni test-has revealed that the significant difference was reported between discharge report and the out-patient sheet and medication sheet (Sig. =0.000), clearly indicating that physicians in medication sheets tend to prescribe more drugs that are listed in local formulary than physicians prescribed in the out-patient sheets and discharge sheets. Additionally, there was no significant difference was reported between the out-patient sheet and medication sheet (Sig. =1.000).

Concerning the No. of drugs prescribed using generic names in the NGHs, as shown in **Table (4.17)**, the average number of drugs prescribed by using generic names in the NGHs sheets among the study settings was 0.10 drugs per sheet. The highest number of drugs prescribed using generic names was reported in the medication sheets with an average of 0.26 drugs per sheet, while the lowest number of drugs prescribed using generic names was reported at discharge sheet with an average of 0.01 drugs per sheet. One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean number of drugs prescribed by using generic names in the NGHs sheets among the study settings, there was a strong statistically significant difference in the mean number of the drugs prescribed by using generic names in the NGHs sheets with (F=133.157, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was between the medication sheets, the discharge sheets and the out-patient sheets (Sig. =0.000), Also, the significant difference was between discharge sheet and out-patient sheet (Sig. =0.014). From researcher expectation to use generic name abundantly in prescriptions in medication sheets, it reflected prescribing habits beside physicians use the local formulary drugs so no pharmaceutical industry marketing effect.

With respect to the No. of prescribed encounter with injectable drugs, as shown in **Table (4.17)**, the average number of prescribed encounters with injectable drugs in the NGHs sheets among the study settings was 0.31 drugs per sheet. The highest number of encounters with prescribed injectable drugs was reported in the medication sheets with an average of 0.83 drugs per sheet, while the lowest number of encounters with prescribed injectable drugs was reported in the discharge sheets with an average of 0.05 drug per sheet. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean number of drugs prescribed by using injectable drugs in the NGHs sheets among the study settings with (F=1699.048, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was between out-patient sheets, and discharge sheets (Sig. =0.000), clearly indicating that physicians prescribing injectable drugs in out-patient sheets is more than discharge sheets. Another significant difference was reported between out-patient sheets and medication sheets (Sig. =0.000), clearly indicating that physicians prescribing injectable drugs in out-patient sheets less than medication sheets. Over prescribing injectable drugs in medication sheets is reflect prescribing habits among physicians as well as the majority of previous studies which have been conducted regarding injections,

mainly have considered issues associated to patients such as their beliefs in order to faster and better effect of injection in comparison to oral formulations, lack of awareness regarding the side effects of injections, and socio-cultural factors that cause patients asks their doctors to prescribe injectable drugs (Choi, Park, Lee et al., 2012).The other studies considerably highlight some factors related to doctors, including economic and financial reasons, competition and pressure from third parties (pharmacies, injection units, and patients) that have been taking into account as the main factors drive them to prescribe injectable drugs regardless of actual indications.(Hwang, Kim, Lee et al., 2007; Chowdhury, Roy, Faroque et al., 2011). This finding clearly appeared the absence of Monitoring and Evaluation efforts of the hospital managements and the absence of any role for the pharmacists in increasing awareness level of physicians and nurses toward the side effects of over prescribing injection drugs.

With respect to the No. of prescribed encounters with antibiotics, as shown in **Table (4.17)**, the average number of prescribed encounters with antibiotics in the NGHs sheets among the study settings was 0.67 drugs per sheet. The highest number of prescribed encounters with antibiotic by physicians was reported in the discharged sheets with an average of 0.94 antibiotic per sheet, while the lowest number of prescribed encounters with antibiotic by physicians was reported in the out-patient sheets with an average of 0.50 antibiotic per sheet. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean number of drugs prescribed antibiotics in the NGHs sheets among the study settings with (F=374.581, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was between out-patient sheets and discharge sheets (Sig. =0.000), clearly indicating that physicians at discharge sheets tend to prescribe more antibiotic drugs than in out-patient sheets. Another significant difference was reported between discharge sheets and medication sheets (Sig. =0.000), clearly indicating that physicians in discharge sheets tend to prescribe antibiotic drugs more than medication sheets (Sig. =0.000). Additionally, there was no significant difference was reported between medication sheets and out-patient sheets (Sig.=0.463) This finding reflects prescribing habits of prescribing antibiotic where approximately one antibiotic was prescribed in every discharge sheet. Additionally, the absence of Monitoring and Evaluation efforts of the hospital managements appear clearly beside the absence of any role for the pharmacists in increasing awareness level of physicians and nurses toward side effects of antibiotics over prescribing in the GG.

4.2.1.2 Descriptive findings of the prescribing indicators group related to the type of sheet and the NGHs

4.2.1.2.1 Average number of drugs prescribed per encounter

Table (4.18): Differences in average number of drugs prescribed per encounter according to the NGHs. (No. of prescriptions =3016, No. of drugs =7555)

Average number of drugs prescribed per encounter					
#	NGHs	Total average of drugs		F	Sig.
		Average	SD		
1	**Al-Amal**	2.52	1.163	30.255	0.000*
2	**Al-Awda**	2.53	1.015		
3	**Al-Karama**	3.08	1.139		
4	**Dar Al-Salam**	2.60	1.052		
5	**Hayfa**	2.54	0.814		
6	**Kuwait**	2.09	0.875		
7	**PFBS**	2.75	1.042		
8	**Public Aid**	2.23	1.074		
9	**Yafa**	2.28	1.048		
Total		**2.5**	**1.072**		
WHO standard		**1.6 - 1.8**			

*Statistically significant

Table (4.18), the 3016 prescriptions were for a total 7555 drugs with average number of drugs per encounter is 2.5 (SD=1.072). polypharmacy was observed in all NGHs, Al-Karama hospital showed the highest average number of drugs per encounter 3.08 (SD=1.139) while Kuwait hospital showed the lowest average number of drugs per encounter 2.09 (SD=0,875). Regarding the GG, our findings is higher than that reported in the governmental PHC 2 (Ayoub, Musalam, & Mahadi, 2017) but lower than that reported in UNRWA 2.77 (Baba, 2012). Globally, this is higher than that reported 2008 in the Dubai private hospital (2.2) (Sharif, Al-Shaqra, Hajjar et al., 2008) and less than the situation in study was conducted in 4 private hospitals in U.A.E (2.9) (Sharif, Al-Shaqra, Hajjar et al., 2008; Rasool, Fahmy, Abu-Gharbieh et al., 2010),Yemen private hospitals (2.9) (Bashrahil, 2010) and Western India private hospitals (3.38) (Shelat & Kumbar, 2015). One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of the total number of drugs prescribed in all NGHs in the GG. As shown in Table (4.18), there was a

statistically significant difference in the total average of drugs prescribed in the NGHS reported among the study settings with (F=30.255, P value=0.000). Post Hoc - Bonfirroni test has revealed that Al-Karama hospital was statistically significant with all the NGHs (Sig. =0.000) while Kuwait hospital was statistically significant with all the NGHs (Sig. =0.000) except Public Aid hospital (Sig. =1.000) and Yafa hospital (Sig. =0.409). It seems that physicians in Al-Karama hospital tend to prescribe more drugs per encounter than all other eight NGHs physicians while it seems that physicians in Kuwait hospital tend to prescribe less drugs per encounter than all other eight NGHs.

Table (4.19): Differences in average number of drugs prescribed per encounter according to the type of sheet (No. of prescriptions =3016, No. of drugs =7555)

#	NGHs	Average number of drugs prescribed per encounter					
		Out-patient sheet		Medication sheet		Discharge sheet	
		Average	SD	Average	SD	Average	SD
1	Al-Amal	0	0	2.4	1.443	2.6	0.83
2	Al-Awda	2.5	0.843	2.5	1.218	2.6	0.951
3	Al-Karama	2.7	0.653	3.6	1.602	3	0.727
4	Dar Al-Salam	2.4	1.157	3.6	1.037	2.5	0.707
5	Hayfa	2.8	0.91	0	0	2.3	0.606
6	Kuwait	2.3	0.867	1.7	0.831	2.3	0.777
7	PFBS	2.6	1.056	2.6	1.132	3	0.865
8	Public Aid	2.2	0.914	2.1	1.413	2.4	0.813
9	Yafa	3.1	0.883	1.4	0.745	2.3	0.571
Total		**2.57**	**0.964**	**2.36**	**1.407**	**2.56**	**0.81**
WHO standard		**1.6 - 1.8**					

As shown in **Table (4.19),** the highest average number of drugs per encounter is in out-patient sheets 2.57 (SD=0.964) while the lowest average number of drugs per encounter is in medication sheets 2.36 (SD=1.407). Our findings is lower than that reported in medication sheets in governmental hospitals in the GG 5.21 (SD=3.138) and in discharge sheets in governmental hospitals in the GG 3 (SD=1.701) (Al-khodary, 2016), In out-patient sheet, Yafa hospital reported the highest average number of drugs prescribed per encounter 3.1 (SD=0.883) while Public Aid hospital reported the lowest average number of drugs prescribed per encounter 2.2 (SD=0.914). On the other hand, in medication sheets Al-Karama hospital reported the highest average number of drugs prescribed per encounter

3.6 (SD=1.602) while Yafa hospital reported the lowest average number of drugs prescribed per encounters 1.4 (SD=0.745).

Table (4.20): percentage of prescriptions according to number of drugs per prescriptions

#	NGHs	One drug (%)	Two drugs (%)	Three drugs (%)	Four drugs (%)	More than 4 drugs (%)
1	**Al-Amal**	12	51.8	18.7	10.9	6.6
2	**Al-Awda**	11.4	45.8	25.8	12.6	4.4
3	**Al-Karama**	4.2	28.3	38.1	17.8	11.6
4	**Dar Al-Salam**	10.5	42.8	27.4	13.7	5.6
5	**Hayfa**	2	56.5	29.8	10.1	1.6
6	**Kuwait**	26.3	46.1	21.3	5.5	0.8
7	**PFBS**	8.9	33.3	40.5	11	6.3
8	**Public Aid**	25.3	43.7	18.7	7.6	4.7
9	**Yafa**	26.9	31.9	29.9	8.9	2.4
Total (%)		**14.2**	**42.2**	**27.8**	**10.9**	**4.9**

Regarding to polypharmacy, the majority of prescriptions (85.8%) contained two drugs and more (WHO standard 1.6-1.8) as shown in **Table (4.20)**, Conversely, (14.2%) of prescriptions with less than 2 drugs. Ayoub study indicated that 66.2% of the study prescriptions contained two drugs and more in the governmental PHC in the GG (Ayoub, Musalam, & Mahadi, 2017). This indicating that GG physicians in the NGHs had tendency towards polypharmacy more than physicians in the governmental PHCs. Hayfa hospital topped up the majority of prescriptions with two drugs and more (98%). The over-prescribing lead to increase possibility of drug-drug interaction and low patient compliance rate. One possible explanation for overprescribing is patient demand, i.e. Patients prefer doctors who prescribe more drugs because they think this will ensure improvement and cure of their condition quickly (H. V. Hogerzeil, 1995).

4.2.1.2.2 Percent of drugs prescribed by generic name

Table (4.21): Differences in percent of drugs prescribed by generic name according to the NGHs (n=7555)

#	NGHs	Percent of drugs prescribed by generic name					
		Total		Mean	SD	F	Sig.
		No	%				
1	**Al-Amal**	29	4.5	0.11	0.352	12.394	0.000*
2	**Al-Awda**	47	5.1	0.13	0.381		
3	**Al-Karama**	79	7.1	0.22	0.628		
4	**Dar Al-Salam**	52	7	0.18	0.512		
5	**Hayfa**	1	0.2	0	0.064		
6	**Kuwait**	20	2.6	0.06	0.241		
7	**PFBS**	44	4.4	0.12	0.381		
8	**Public Aid**	9	1	0.02	0.147		
9	**Yafa**	25	3	0.07	0.252		
Total		**306**	**3.3**	**0.1**	**0.374**		
WHO standard		**100%**					

*Statistically significant.

As showed in **Table (4.21)**, the mean number of drugs prescribed by using generic name per prescription is 0.10 (SD=0.374). The study revealed that the minority of drugs were prescribed using their generic names (3.3%). This result is lower than Dubai 4.4% (Sharif, Al-Shaqra, Hajjar et al., 2008), Western India 6.7% (Shelat & Kumbar, 2015) and Yemen 39.2% (Bashrahil, 2010) and higher than reported in 2017 in India hospital where no single prescribed drugs was reported with generic name (Bashrahil, 2010; Aravamuthan, Arputhavanan, & Subramaniam, 2017). In this study all selected NGHs showed very low tendency to use drugs generic name, Hayfa hospital prescriptions showed the lowest percentage in using drugs generic name 0.2% while Al-Karama hospital recorded just 7.1% as a best percentage of using drugs generic name. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of number of drugs prescribed by using generic name in all NGHs in the GG. As shown in **Table (4.21)**, there was a statistically significant difference in the mean of number of drugs prescribed by using generic name in the NGHs reports among the study settings with (F=12.394, P value=0.000). Post Hoc - Bonfirroni test has revealed that

the significant difference was reported between Al-Karama hospital (Sig. =0.033), Public Aid hospital (Sig. =0.000), PFBS hospital (Sig. =0.012), Hayfa hospital, Kuwait hospital, Yafa hospital (Sig. =0.000) and Al-Amal hospital (Sig. =0.014). It seems that physicians in Al-Karama hospital tend to prescribe more drugs by using generic name than in Public Aid hospital, PFBS hospital, Hayfa hospital, Kuwait hospital, Yafa hospital and Al-Amal hospital physicians. On the other hand, no statistically significant between Al-Karama hospital and Dar Al-Salam hospital (Sig. =1.000). while Hayfa hospital was statistically significance with all NGHs except Public Aid hospital, Kuwait hospital and Yafa hospital (Sig. =1.000). It seems that physicians in Hayfa hospital tend to prescribe less drugs by using generic name than all NGHs physicians.

Table (4.22): Differences in percent of drugs prescribed by generic name according to the type of sheet

#	NGHs	Percent of drugs prescribed by generic name					
		Outpatient sheet		Medication sheet		Discharge sheet	
		No	%	No	%	No	%
1	**Al-Amal**	0	0	26	4	3	0.5
2	**Al-Awda**	24	2.6	20	2.2	3	0.3
3	**Al-Karama**	0	0	79	7.1	0	0
4	**Dar Al-Salam**	11	1.5	39	5.3	2	0.3
5	**Hayfa**	0	0	0	0	1	0.2
6	**Kuwait**	8	1.1	12	1.6	0	0
7	**PFBS**	11	1.1	32	3.2	1	0.1
8	**Public Aid**	2	0.2	6	0.7	1	0.1
9	**Yafa**	0	0	22	2.6	3	0.4
Total		**56**	**0.7**	**236**	**2.4**	**14**	**0.2**
WHO standard		**100%**					

As showed in **Table (4.22)**, the highest percentage of using generic name is in medication sheets 2.4% while the lowest percentage of using generic name is in discharge sheets 0.2%. These results may indicate a strong influence of the pharmaceutical industry on prescribers. The high ratio showed in prescribing drugs with trade name reflect the clear influence of drug companies through their representatives. Economic factors may play a role, as some pharmaceutical companies pay rewards to doctors who prescribe their products and this discourages generic prescribing (Mohlala, Peltzer, Phaswana-Mafuya et al., 2010). A study conducted in Zimbabwe found that other factors, such as the desire to sustain income, play a role in the prescribing and dispensing habits of private doctors

(Trap, Hansen, & Hogerzeil, 2002). It is bad practice, drugs with similar names have been cross-prescribed. Here the hapless patient assumes only risk (sometimes life-threatening) and expense for no potential benefit (Flegel, 2012).

4.2.1.2.3 Percent of encounter with injection

Table (4.23): Differences in percent of encounter with injection according to the NGH

#	NGHs	Percent of encounter with injection					
		Total		Mean	SD	F	Sig.
		No	%				
1	**Al-Amal**	124	50.2	0.48	0.501		
2	**Al-Awda**	115	31.7	0.32	0.465		
3	**Al-Karama**	121	33.6	0.34	0.473		
4	**Dar Al-Salam**	69	11.6	0.24	0.429		
5	**Hayfa**	35	14.1	0.14	0.349		
6	**Kuwait**	116	32	0.32	0.467	11.957	0.000*
7	**PFBS**	147	40.3	0.4	0.492		
8	**Public Aid**	115	29.6	0.28	0.451		
9	**Yafa**	106	28.3	0.29	0.453		
Total		**948**	**30.2**	**0.31**	**0.464**		
WHO standard		**13.4% -24.1%**					

*Statistically significant.

As shown in **Table (4.23)**, the mean of number of encounters with injectable drugs per prescription is 0.31 (SD=0.464). As shown in **Table (4.23)**, regarding to using injectable drugs, over prescribing injectable drugs was reported, one third of encounter 30.2 % with injection drugs (range 1-7 drugs per prescription), (WHO standard: 13.4% -24.1%). This finding is higher than reported in PHC in the GG 1.3% (Ayoub, Musalam, & Mahadi, 2017), Yemen hospitals 22.2% (Bashrahil, 2010), Western India hospital 20.8% (Shelat & Kumbar, 2015) and U.A.E. private hospitals 2.9% (Rasool, Fahmy, Abu-Gharbieh et al., 2010). All NGHs in the study are not matching WHO standard in prescribed injectable drugs percentage except Hayfa hospital 14.1% and Dar Al-Salam hospital 11.6%. The highest percentage of encounter with injectable drugs were recorded in Al-Amal hospital 50.2%. while the lowest percentage of encounter with injectable drugs were recorded in Dar Al-Salam hospital 11.6%. One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of

prescribing encounters with injectable drugs in study participated NGHs in the GG. As shown in **Table (4.23)**, there was a statistically significant difference in the mean number of encounters with injectable drugs prescribed in the NGHs reports among the study settings with (F=11.957, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was reported between Al-Amal hospital and all NGHs (Sig.=0.000) except PFBS hospital (Sig.=1.000). This clearly indicated that physicians in Al-Amal hospital tend to prescribe encounters with injectable drugs more than all NGHs in the GG. Another significant difference was reported between Dar Al-Salam hospital, Al-Amal hospital and PFBS hospital (Sig.=0.000), clearly indicating that physicians in Dar Al-Salam hospital tend to prescribe encounters with injectable drugs less than all NGHs. Additionally, there was no significant difference was reported between Dar Al-Salam hospital and Public Aid hospital, Yafa hospital, Al-Awda hospital, Kuwait hospital, (Sig.=1.000) Al-Karama hospital (Sig.=0.347) and Hayfa hospital (Sig.=0.400)

Table (4.24): Differences in percent of encounter with injection according to the type of sheets

#	NGHs	Percent of encounter with injection					
		Outpatient sheet		Medication sheet		Discharge sheet	
		No	%	No	%	No	%
1	Al-Amal	0	0	107	87.7	17	12.6
2	Al-Awda	2	1.6	111	91.7	2	1.7
3	Al-Karama	2	1.7	119	99.2	0	0
4	Dar Al-Salam	27	22.3	41	97.6	1	0.8
5	Hayfa	24	19.4	0	0	11	8.9
6	Kuwait	11	9.2	103	85.1	2	1.7
7	PFBS	22	18.3	115	94.3	10	8.3
8	Public Aid	24	17.9	85	66.9	6	4.1
9	Yafa	33	26.2	65	52	8	6.8
Total		**145**	**14.5**	**746**	**84.3**	**57**	**5.6**
WHO standard		**13.4% -24.1%**					

As shown in **Table (4.24)**, The lowest percentage of encounters with injectable drugs were recorded in discharge sheets 5.6% while the highest percentage of encounters with injectable drugs were recorded in medication sheets 84.3%. In medication sheets Al-

Karama hospital topped up the percentage of prescribing injectable drugs 99.2% followed with PFBS hospital 94.3% and Al-Awda hospital 91.7%. On the other hand, in discharge sheets, Al-Amal hospital topped up the percentage of prescribing injectable drugs 12.6% followed with Hayfa hospital 8.9% and PFBS hospital 8.3%. Injection use has advantages as well as disadvantages, injections disadvantages are inconvenient, more expensive, less safe, painful and require skilled personnel to administer, unsafe injection has become a very common issue and is practiced in many countries due to poor practical practice for injection safety standards; it is the major cause of transmission of diseases such as hepatitis B, hepatitis C and HIV, WHO estimates that 50% of injections performed in developing countries are unsafe (Van Tuong, Phuong, Anh et al., 2017). Injections are always more expensive than oral formulations (WHO, 2002a), so the use of injections should be limited for emergency cases only.

4.2.1.2.4 Percent of drugs prescribed from local formulary

Table (4.25): Differences in percent of drugs prescribed from local formulary according to the NGH.

#	NGHs	Percent of drugs prescribed from local formulary					
		Total		Mean	SD	F	Sig.
		No	%				
1	Al-Amal	328	54.2	1.28	1.460	61.588	0.000*
2	Al-Awda	789	85.6	2.16	1.002		
3	Al-Karama	1077	96.9	2.99	1.157		
4	Dar Al-Salam	708	95	2.48	1.030		
5	Hayfa	557	89.1	2.25	0.854		
6	Kuwait	643	85.4	1.78	0.904		
7	PFBS	873	88	2.40	0.999		
8	Public Aid	879	97	2.16	1.070		
9	Yafa	768	92.3	2.08	1.034		
Total		**6622**	**88.7**	**2.20**	**1.144**		
WHO standard		**100%**					

*Statistically significant.

With regards to prescribing drugs from the local formulary, local formulary in the NGHs, the researcher didn't find any official local formulary so the constant purchasing drug list for the last 2 years considered as the local formulary for the health facility. As showed in

Table (4.25), the mean of number of drugs prescribed from local formulary per prescription is 2.20 (SD=1.144). The majority of prescribed drugs were from local formulary (88.7%). This finding is better than reported in Yemen hospital 78.9% (Bashrahil, 2010) and in Western India 70% (Shelat & Kumbar, 2015) but less than south Africa hospitals 92.6% (Mohlala, Peltzer, Phaswana-Mafuya et al., 2010). The highest percentage of prescribing local formulary drugs reported in Public Aid Hospital 97%. The lowest percentage of prescribing local formulary drugs reported in Al-Amal hospital 54.2%. The NGHs managements justified the reason of percentages of prescribing local formulary drugs lower than 100% that number of drugs not listed in local formulary due low consumption rate but the NGH provide these drugs under physicians' requests.

One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of prescribing local formulary drugs in all NGHs in the GG. As shown in **Table (4.25)**, there was a statistically significant difference in the mean number of prescribing local formulary drugs in the NGHs reports among the study settings with (F=61.588, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was reported between Public Aid hospital and Al-Karama hospital, Al-Amal hospital, Kuwait hospital (Sig.=0.000), Dar Al-Salam hospital (Sig.=0.003) and PFBS hospital (Sig.=0.05). The physicians tend to prescribe local formulary drugs in Public Aid hospital more than physicians in Al-Karama hospital, Al-Amal hospital, Kuwait hospital, Dar Al-Salam hospital and PFBS hospital. There was no statistically significance was reported between Public Aid hospital, Hayfa hospital, Yafa hospital and Al-Awda hospital (Sig.=1.000). Additionally, Al-Amal hospital was statistically significance with all NGHs. The physicians tend to prescribe local formulary drugs in Al-Amal hospital less than physicians in all study participated NGHs.

The NGHs' managements justified the poor compliance in prescribing local formulary drugs due to; pharmaceutical companies offer for physicians to prescribe drugs by certain trade names, local formulary drug list is not mandatory for physicians, weak communication channels between physicians, hospital managements and hospital pharmacists, NGHs design local formulary to cover certain common ailments and it is therefore not possible to have all prescribed drugs which could be out of the local formulary drug list, thus could be due to the weak economic status of the NGHs during the last 10 years as a result from the Israeli siege.

Table (4.26): Differences in percent of drugs prescribed from local formulary according to the type of sheet.

#	NGHs	Percent of drugs prescribed from local formulary					
		Outpatient sheet		Medication sheet		Discharge sheet	
		No	%	No	%	No	%
1	Al-Amal	0	0	287	96.6	41	11.7
2	Al-Awda	239	77.3	290	97.3	260	82
3	Al-Karama	319	98.2	428	100	330	92.4
4	Dar Al-Salam	267	92.7	146	96.7	295	97.4
5	Hayfa	286	82.4	0	0	271	95.8
6	Kuwait	209	76.8	178	88.1	256	91.1
7	PFBS	285	91.3	297	93.4	291	79.3
8	Public Aid	279	95.9	262	100	338	95.2
9	Yafa	366	92.4	171	100	231	84
Total		**2250**	**88.4**	**2059**	**96.9**	**2313**	**81**
WHO standard		**100%**					

As shown in **Table (4.26)**, The highest percentage of prescribing local formulary drugs reported in medication sheets (96.9%) and the lowest percentage of prescribing local formulary drugs reported in discharge sheets (81%). thus, clearly indicate that physicians in the NGHs showed more compliance in prescribing local formulary drugs in mediation sheets more than in discharge sheet. In the governmental hospital in the GG, a study showed that same orientation in prescribing EDL drugs in medication sheets and discharge sheets (Al-khodary, 2016).

4.2.1.2.5 The most common prescribed therapeutic class in the NGHs in the GG

Table (4.27): Percentage of drug prescribed groups to the total number of drugs prescribed

#	NGHs	Analgesic		Antibiotic		Others*	
		No	(%)	No	(%)	No	(%)
1	Al-Amal	274	42.3	229	35.2	145	22.6
2	Al-Awda	247	26.7	430	46.5	247	26.7
3	Al-Karama	381	34.3	445	40.1	284	25.6
4	Dar Al-Salam	272	36.7	263	35.4	207	27.9
5	Hayfa	290	46	190	30	150	24
6	Kuwait	290	38.4	240	31.8	225	29.6
7	PFBS	382	38.3	288	28.9	327	32.8
8	Public Aid	357	39.3	315	34.7	236	26
9	Yafa	449	53.4	163	19.4	229	27.2
Total		**2942**	**38.9**	**2563**	**33.9**	**2050**	**27.2**

*Others consist of Corticosteroids, Anti-acid, Minerals, Vitamins and food supplements, cardiovascular drugs, Hormones…etc.

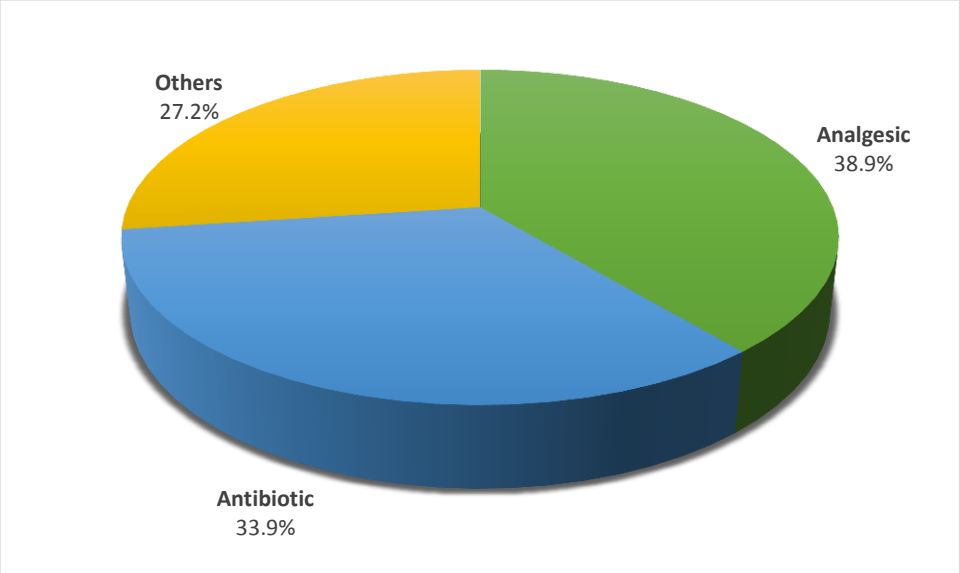

Figure (4.2): Percentage of drugs group prescribed to the total number of drugs prescribed in the NGHs in the GG

As shown in **Table (4.27)**, The most commonly prescribed therapeutic class was analgesics group, these were encountered in 38.9% of drugs were prescribed in the study and NSAIDs was the most commonly prescribed of this group (71.5%). Regarding the GG, our finding is higher than that reported in the governmental PHC 20.8% (Ayoub, Musalam & Mahadi, 2017).

Antibiotics were the second most commonly prescribed medication 33.9 % (range 1-4 antibiotic per prescription). Antibiotic prescription is remarkably less than reported in the governmental PHC in the GG (40.9%) (Ayoub, Musalam & Mahadi, 2017). Globally, our finding is more than reported in Dubai 21.4% (Sharif, Al-Shaqra, Hajjar et al., 2008) but less than reported in other both western and eastern countries as Sudan 63% (Forshaw, Fresle, Salami et al., 1991), Iran 61.9% (Moghadamnia, Mirbolooki, & Aghili, 2002), England 60.7% (Majeed & Moser, 1999) and Norway 48% (Lindbaek, Berild, Straand et al., 1999).

Other medications as corticosteroids, anti-acid, minerals, vitamins and food supplements, cardiovascular drugs, hormones…etc prescribed in small proportions which collectively encountered 27.2% **(Figure 4.2)**.

Regarding to percentage of analgesic prescription in the NGHs in the GG, the highest percentage of prescribing analgesic was reported in Yafa hospital (53.4%) while the lowest percentage of prescribing analgesic was reported in Al-Awda hospital (26.7%) Additionally, for antibiotic use, the highest percentage of prescribing antibiotics was reported in Al-Awda hospital 46.5% while the lowest percentage of prescribing antibiotics was reported in Yafa hospital (19.4%).

In Yafa hospital, the percent of antibiotic and analgesic 19.4% and 53.4% respectively considered as an underestimated result, this consideration is due to most of available outpatient sheets were for orthopedic department.

4.2.1.2.6 The most common prescribed analgesic groups

Table (4.28): Percentage of analgesic groups to the total number of prescribed analgesics in the NGHs in the GG

#	Analgesic		Percentage from analgesic group (%)
1	Single analgesic	Non-Steroidal Anti-inflammatory Drugs (NSAIDs)	71.5
2		Opioid analgesic	12.5
3	Combination analgesic*		16
Total			**100**

*Combination analgesics include Opioid+ NSAIDs combination, NSAIDs+ codeine or/with caffeine combination.

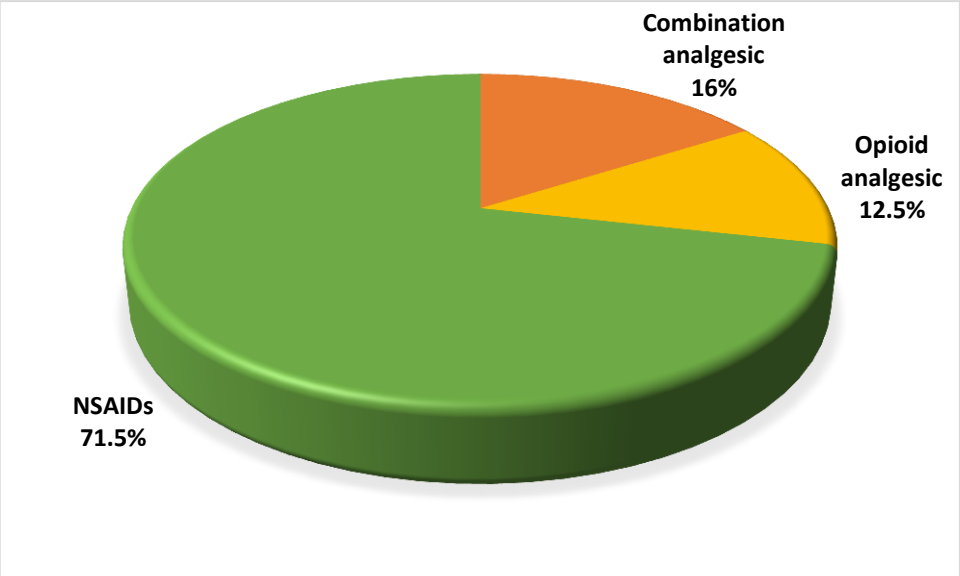

Figure (4.3): Percentage of analgesic groups to the total number of prescribed analgesics in the NGHs in the GG.

As showed in **Table (4.28)** Analgesic group is the major group of drugs prescribed in the NGHs (39.9%), (range 1-3 drugs per prescription). As showed in **Table (4.28),** the majority of prescribed analgesics was related to single analgesic drug (84%) and non-steroidal anti-inflammatory drugs (NSAIDs) was the most commonly analgesic prescribed 71.5%. The Finding of prescribed NSAIDs in the study was more than reported in Dubai private hospital 23.4% (Sharif, Al-Shaqra, Hajjar et al., 2008). Additionally, 12.5% of prescribed analgesic was opioid analgesic and 16% of prescribed analgesic was combination analgesics include Opioid + NSAIDs combination, NSAIDs + codeine or/with caffeine combination.

4.2.1.2.7 Percent of encounter with antibiotic

Table (4.29): Differences in percent of encounter with antibiotic according to the NGH

#	NGHs	Percent of encounter with antibiotic					
		Total		Mean	SD	F	Sig.
		No	%				
1	**Al-Amal**	196	75.9	0.76	0.426	35.171	0.000*
2	**Al-Awda**	304	83.4	0.83	0.374		
3	**Al-Karama**	289	80.3	0.8	0.398		
4	**Dar Al-Salam**	237	81.9	0.83	0.375		
5	**Hayfa**	169	68.2	0.68	0.467		
6	**Kuwait**	201	55.5	0.56	0.498		
7	**PFBS**	233	64.2	0.64	0.48		
8	**Public Aid**	248	59.8	0.61	0.488		
9	**Yafa**	152	42.3	0.41	0.493		
Total		**2029**	**67.9**	**0.68**	**0.44**		
WHO standard		**20%-26%**					

*Statistically significant.

As shown in **Table (4.29)** more than two thirds of encounters with an antibiotic 67.9% (WHO standard 20% - 26%). As shown in **Table (4.29)**, the mean of number of encounters with antibiotics is 0.68 (SD=0.44). The highest percentage of encounter with antibiotic reported in Al-Awda hospital 83.4% (range 2-3 antibiotics per prescription) while the lowest percentage of encounter with antibiotic reported in Yafa hospital 42.3%.

Overprescribing of antibiotic in the NGHs in the GG is a common problem which found also in UNRWA clinics 32.9% (Baba, 2012) and in the governmental PHC in the GG 67.5% (Ayoub, Musalam & Mahadi, 2017). These results are similar in other studies done in some neighboring Arab countries in the Middle East and gulf countries, Syria, Jordan, U.A.E, Yemen and Sudan, where over use of antibiotics was the most common drug use problem in these countries. Percentage of prescriptions containing antibiotics in Syria, Jordan were 45% ,55% (Lewis), in U.A.E 31.1% (Rasool, Fahmy, Abu-Gharbieh et al., 2010), in Yemen 64.5% (Bashrahil, 2010) and in Sudan 63% (H. V. Hogerzeil, Ross-Degnan, Laing et al., 1993). Additionally, Ethiopia 58.1% (Desalegn, 2012), Uganda 56% (H. V. Hogerzeil, Ross-Degnan, Laing et al., 1993), 47% in Lao (Keohavong, Syhakhang, Sengaloundeth et al., 2006) and 58% in the Islamic Republic of Iran (Cheraghali, Nikfar, Behmanesh et al., 2004) have the same overuse antibiotics problem.

One-way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the mean of encounter with antibiotic in all NGHs in the GG. As shown in **Table (4.29)**, there was a statistically significant difference in the mean of encounter with antibiotic in the NGHs reports among the study settings with (F=35.171, P value=0.000). Post Hoc - Bonfirroni test has revealed that the significant difference was reported between Al-Awda hospital, Public Aid hospital, PFBS hospital, Kuwait hospital, Yafa hospital (Sig=0.000) and Hayfa hospital (Sig=0.002). The physicians tend to prescribe antibiotic drugs in Al-Awda hospital more than physicians in Public Aid hospital, PFBS hospital, Kuwait hospital, Yafa hospital and Hayfa hospital. There was no statistically significance was reported between Al-Awda hospital and Al-Amal hospital, Al-Karama hospital and Dar Al-Salam hospital (Sig.=1.000). Additionally, Yafa hospital was statistically significance with all the NGHs (Sig=0.000). The physicians tend to prescribe antibiotic drugs in Yafa hospital less than physicians in all the NGHs.

Table (4.30): Differences in percent of encounter with antibiotic according to the NGH

#	NGHs	Percent of encounter with antibiotic					
		Outpatient sheet		Medication sheet		Discharge sheet	
		No	%	No	%	No	%
1	**Al-Amal**	0	0	83	68	113	83.7
2	**Al-Awda**	74	60.2	111	91.7	119	98.3
3	**Al-Karama**	93	77.5	79	65.8	117	97.5
4	**Dar Al-Salam**	79	65.3	38	90.5	120	98.4
5	**Hayfa**	46	37.1	0	0	123	99.2
6	**Kuwait**	55	45.8	36	29.8	110	90.9
7	**PFBS**	65	54.2	52	42.6	116	95.9
8	**Public Aid**	59	44	57	44.9	132	90.4
9	**Yafa**	21	16.7	17	13.6	114	96.6
Total		**492**	**50.1**	**473**	**50.9**	**1064**	**94.5**
WHO standard		**20%-26%**					

As shown in **Table (4.30**), the highest percentage of encounter with antibiotic recorded in discharge sheets 94.5%, Hayfa Hospital 99.2% represent the highest percentage of encounter with antibiotic recorded in discharge sheets while the lowest percentage of encounter with antibiotic recorded in Al-Amal hospital 83.7%. On the other hand, the lowest percentage of encounter with antibiotic recorded in out-patient sheets 50.1%, in out-patient sheets Al-Karama Hospital represent the highest percentage of encounter with

antibiotic 77.5% while the lowest percentage of encounter with antibiotic recorded in Yafa hospital 16.7%.

4.2.1.2.8 The most common types of prescribed antibiotics in the NGHs in the GG

Table (4.31): The classification of antibiotics prescribed in the NGHs in the GG

#	NGHs	Cephalosporins (%)	Fluoroquinolones (%)	Metronidazole (%)	Penicillin's (%)	Macrolides (%)	Others* (%)
1	**Al-Amal**	61.1	20.5	10.5	4.4	0	3.5
2	**Al-Awda**	42.9	15.6	14.9	10.7	2.8	13.1
3	**Al-Karama**	37.7	11.3	29.8	9.4	14	1.1
4	**Dar Al-Salam**	44.8	22.6	3.8	21.5	5.7	1.5
5	**Hayfa**	55.3	29.5	5.3	5.8	1.1	3.2
6	**Kuwait**	51.6	16	12.3	10.2	1.6	8.2
7	**PFBS**	42.7	17	13.9	11.5	8.3	6.6
8	**Public Aid**	47.9	7.9	17.1	14.9	8.6	3.5
9	**Yafa**	63.8	12.9	1.8	20.2	0	1.2
Total		**49.8**	**17**	**12.2**	**12.1**	**4.7**	**4.7**

*Others: Tetracyclines,Aminoglycosides, Sulphonamides/trimethoprim,Lincosamide, Fusidic acid and Nitrofurantoin

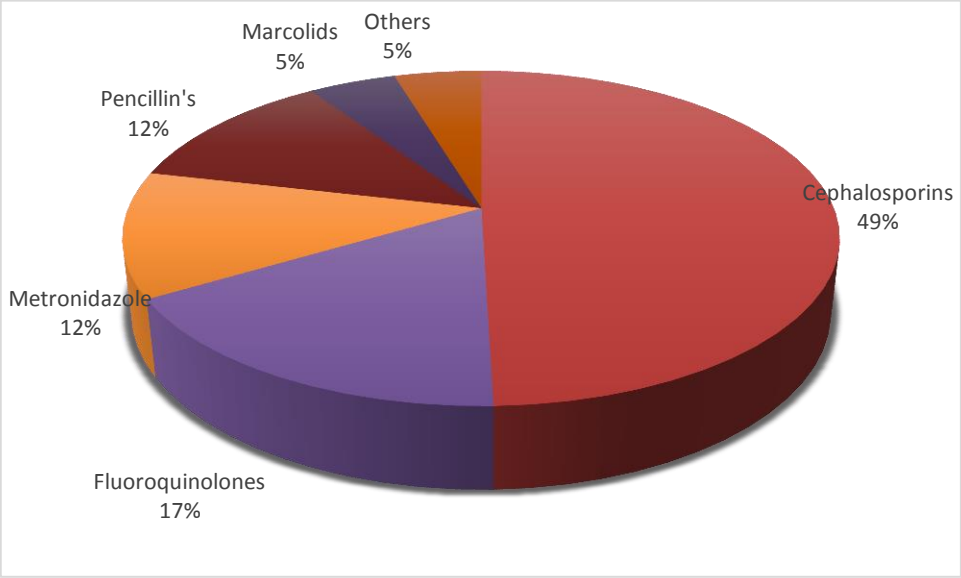

Figure (4.4): The most common prescribed antibiotic groups at the NGH in the GG.

Overuse of antibiotics can lead to serious clinical problems mainly as antibiotic resistance which in turn lead to longer hospital stays, higher medical costs and increased mortality (WHO, 2018). As shown in **Table (4.27),** our findings revealed that the second most commonly prescribed therapeutic class in the NGHs in the GG is antibiotics (33.9%). Additionally, all NGHs reported percentages of encounter with antibiotics more than WHO

optimal value (20%-26%), the major prescribed groups of antibiotics are; Cephalosporins 49.8%, Fluoroquinolones 17%, Metronidazole 12.2%, Penicillin's 12.1%, Macrolides 4.7% and other groups 4.7% (include Aminoglycosides, Tetracyclines, Nitrofurantoin Fusicdic acid, Lincosamide and Sulphonamides- trimethoprim). Regarding to Cephalosporins group, the third generation of cephalosporin (Cefotaxime, Ceftazidime, Ceftriaxone) reported the highest percentage of prescribed antibiotic 26% followed with the second generation of cephalosporin (Cefuroxime, Cefaclor, Cefixime) with 19.8%, and ceftriaxone 15.6% was the most common antibiotic in this class. Globally, the most common prescribed antibiotic is amoxicillin-clavulanate 13.5% in Dubai hospital (Sharif, Al-Shaqra, Hajjar et al., 2008) and amoxicillin in Ethiopia hospitals 16.4% (Desalegn, 2012) and Barasil hospitals 23.6% (Ferreira, Heineck, Flores et al., 2013). Our results revealed the antibiotic resistance problem in the GG due to antibiotics overprescribing which lead to use third generation cephalosporins in most of medical treatments while amoxicillin still the first drug of choice in number of countries.

4.2.1.3 Complementary indicators in the selected NGHs in the GG

Table (4.32): Complementary indicators in the selected NGHs in the GG.

#	NGHs	Encounter cost ($)	Medicine costs spent on antibiotics (%)
1	**Al-Amal**	9	54.2
2	**Al-Awda**	8.5	58.3
3	**Al-Karama**	11.7	55
4	**Dar Al-Salam**	9.8	53.5
5	**Hayfa**	17.9	39.3
6	**Kuwait**	7.9	46.5
7	**PFBS**	11.1	44.1
8	**Public Aid**	11.4	47.3
9	**Yafa**	10.8	26.1
Total		**10.9**	**47.14**

Regarding to the average drug costs per encounter, Data on drug costs will always be important in managing policy related to drug supply, pricing and use (WHO, 2003a). As shown in **Table (4.32)**, the average drug costs per encounter in the NGHs was 10.9$, The average cost directly linked with the average number of drugs prescribed per encounter.

The lowest average drug costs per encounter reported in Kuwait hospital 7.9 $ which reported the lowest average number of drugs prescribed per encounter (2.09) as showed in **Table (4.18)** while the highest average drug costs per encounter reported in Hayfa hospital 17.9$ although Hayfa hospital didn't report the highest average number of drugs prescribed per encounter (2.54) as showed in **Table (4.18)** thus may be because no medication sheets were available in Hayfa Hospital as well as all reported drugs cost were for drugs in discharge sheets and out-patient sheets. On the other hand, Al-Karama hospital reported the second highest average drug costs per encounter 11.7$ thus due to Al-Karama hospital reported the highest average number of drugs prescribed per encounter (3.08) as showed in **Table (4.18)**.

The average cost in the NGHs in the GG was higher than reported in India 1$ (Hazra, Tripathi, & Alam, 2000). Researcher found difficulties to find updated studies highlighted the average drug costs per encounter indicator.

On the other hand, less than one half of the drug costs in the selected NGHs spent on antibiotics (47.14%) which indicated the overuse of antibiotic and explain the bad health consequences indicated in reporting high percentage of using third generation of cephalosporins 26% due to antibiotics resistance. The high percentage of drug costs spent on antibiotics reflected in percentage of antibiotic prescribed 33.9% as shown in **Table (4.27)** and percent of encounter with antibiotic 67.9% as shown in **Table (4.29**), the highest percentage of drug costs spent on antibiotics reported in Al-Awda hospital (58.3%) which in turn reported the highest percentage of prescribed antibiotic (46.5%). On the other hand, the lowest percentage of drug costs spent on antibiotics reported in Yafa hospital (26.1%) which in turn reported the lowest percentage of prescribed antibiotics (19.4%).

The general trend in the world is managing use of antibiotic because of antibiotic resistance and its health problems consequences. In 1996, a study was conducted in U.S.A. and showed that the total acquisition costs of antibiotics (adjusted for inflation) decreased from 24.8% (987$ to 547$) of the pharmacy drug expenditure budget in 1988 to 12.9% (612$ to 500$) in 1994, this achievement has been achieved by using computerized an antibiotic management program and prescribing guidelines were developed for inpatient prophylactic, empiric, and therapeutic uses of antibiotics (Pestotnik, Classen, Evans et al., 1996).

4.3 Prescription writing skills

4.3.1 Prescriber information

Table (4.33): Prescriber information for the selected NGHs

#	NGHs	Prescriber name (%)	Prescriber stamp (%)	Prescriber signature (%)	Prescriber specialty degree (100%)			Prescription date (%)
					GP	SP	Unknown	
1	**Al-Amal**	80.9	24.5	78.6	22.6	58.8	18.7	84.4
2	**Al-Awda**	53	30	60	14	24	62	91
3	**Al-Karama**	53.1	22.8	78.3	12.2	46.9	40.9	78.1
4	**Dar Al-Salam**	35.1	39.6	52.3	17.9	31.6	50.5	94
5	**Hayfa**	100	49.6	58.5	0.8	50.4	48.8	98.8
6	**Kuwait**	24.3	66.3	77.1	19.9	61.3	18.8	93.9
7	**PFBS**	61.7	54.8	66.4	5.8	50.7	43.5	82.9
8	**Public Aid**	0.8	0.2	68.3	15.8	72.7	11.5	78.1
9	**Yafa**	4	63	57	6.8	59.4	33.8	85
Total		**45.9**	**39**	**66.3**	**12.9**	**50.6**	**36.5**	**87**

With regards to the prescriber information in **Table (4.33)**, showed that physician name, stamp, signature, specialty and prescription date were omitted in 54.1%, 61%, 33.7%, 36.5% and 13% of prescriptions, respectively. Conversely, in 2008 a study was conducted in Dubai hospital and reported that physician name, signature, specialty and stamp were omitted in 12.2%, 10.3%, 20.3%, and 54.9% of prescriptions (Sharif, Al-Shaqra, Hajjar et al., 2008), in Nigeria private hospitals a study showed physician name and signature were omitted in 80% and 30% respectively (Akoria & Isah, 2008).

Regarding date of visit, the NGHs registration recorded 87% while in Nigeria recorded 90% (Akoria & Isah, 2008) and in U.A.E. recorded 85% (Rasool, Fahmy, Abu-Gharbieh et al., 2010). Generally, date of visit records showed low missing through all NGHs in the GG. The good results are due to physician interest in the time of review which is associated with financial issues as well as to monitor the patient's improvement during the treatment period.

The highest percentage of prescriber name reported in Hayfa hospital encounters which showed perfect compliance in recording prescriber name while the lowest percentage of prescriber name reported in Public Aid hospital 0.8%.

Similar in prescriber stamp, Kuwait hospital recorded the highest percentage of prescriber stamp with 66.3% while Public Aid hospital recorded the lowest percentage of prescriber stamp with 0.2%.

Regarding to prescriber signature, the highest percentage of prescriber signature reported in Al-Amal hospital 78.6% while the lowest percentage of prescriber name reported in Dar Al-Salam hospital 52.3%.

With respect to specialty of prescribers' omission was also seen. the highest percentage of prescriber specialty omission reported in Al-Awda hospital 62% while the lowest percentage of prescriber specialty omission reported in Public Aid hospital 11.5%.

Finally, the highest percentage in recording prescription date reported in Hayfa hospital 98.8% while the lowest percentage in recording prescription date reported in Al-Karama hospital and Public Aid hospital 78.1%.

The NGHs management justified prescriber's poor compliance in doing stamp, signature and specialty due to their dependence on the ability of medical staff to distinction the prescribers from their hand writing style and common type of drugs were written in the prescriptions.

These errors hinder the researcher to determine the accurate reason of overprescribing of antibiotics. Previous studies showed significant alterations in prescribing antibiotics by raising of academic detailing, this alteration was in the following areas; inappropriate prescription, development of resistance, choice of drug and cost (MacDonald, Collins, McGilchrist et al., 1995; Ilett, Johnson, Greenhill et al., 2000), By linking findings in **Table (4.27)** and **Table (4.33)**, comparing to the other NGHs, Al-Awda hospital reported the highest percentage of antibiotics prescription 46.5% and lowest specialist percentage 24% with the highest unknown prescriber's specialty percentage 62%, on the other hand, the opposite occur in Public Aid hospital where the highest specialist percentage reported 72.7% with relatively low ratio in prescribing antibiotics 34.7%.

Regarding to prescriber address and telephone, no address or telephone for the prescriber were written in the prescriptions because physicians use the NGHs pre-printed forms on prescription order blanks the name and address of the NGHs.

4.3.2 Patient information

Table (4.34): Patient information for the NGHs in the GG

#	NGHs	Patient name (%)	Patient address (%)	Patient telephone (%)	Patient age (%)
1	**Al-Amal**	100	0.4	64.2	98.1
2	**Al-Awda**	99.7	82.2	85.5	86.3
3	**Al-Karama**	99.4	59.2	27.5	74.2
4	**Dar Al-Salam**	98.9	74	53.3	95.8
5	**Hayfa**	99.2	50.8	54.4	89.1
6	**Kuwait**	98.3	71.8	64.4	75.4
7	**PFBS**	99.4	98.9	33.6	99.2
8	**Public Aid**	97.3	57	42.3	86.7
9	**Yafa**	100	67	58	67
Total		**99.1**	**62.4**	**53.7**	**85.8**

As shown in **Table (4.34)**, patient information in the NGHs in the GG showed that patient name reported in 99.1% of the study prescriptions while U.A.E. recorded patient name in 97% of the study prescriptions (Rasool, Fahmy, Abu-Gharbieh et al., 2010) and Nigeria recorded 70% of the study prescriptions (Akoria & Isah, 2008).

On the other hand, as shown in **Table (4.34)**, patient address reported 62.4% while in Nigeria reported 50% (Akoria & Isah, 2008).

Additionally, as shown in **Table (4.34)**, patient telephone recorded 53.7% while in U.A.E. 30% (Rasool, Fahmy, Abu-Gharbieh et al., 2010).

Finally regarding patient age, as shown in **Table (4.34)**, in the NGHs in the GG patient age recorded in 85.8% while in Nigeria recorded 80% (Akoria & Isah, 2008) and in U.A.E. recorded 36% (Rasool, Fahmy, Abu-Gharbieh et al., 2010).

As shown in **Table (4.34)**, the highest percentage in recording patient name reported in Yafa hospital and Al-Amal hospital where recording was perfect while the lowest percentage in recording patient name reported in Public Aid hospital 97.3%.

Regarding patient address, the highest percentage in recording patient address reported in PFBS hospital 98.9% while the lowest percentage in recording patient address reported in Al-Amal hospital 0.4%.

Additionally, the highest percentage in recording patient telephone reported in Al-Awda hospital 85.5% while the lowest percentage in recording patient address reported in Al-Karama hospital 27.5%.

Finally, the highest percentage in recording patient age reported in PFBS hospital 99.2% while the lowest percentage in recording patient age reported in Yafa hospital 67%.

Regarding NGH managements, such errors in recording patient information occur because of professional negligence, doing multiple tasks, tiring or busy schedule and unavailable computerized system or preferring use pre-printing forms.

Omission errors include those related to patient information (patient's name, age) and errors related to the prescriber's information (prescriber's name, address, phone number, qualification, registration and date) (Atif, Azeem, Sarwar et al., 2018). Omission errors mainly occurred in inpatient sheets (medication sheets and discharge sheets), NGHs did not use computerized system in inpatient department. On the other hands, out-patient sheet may be entered into an electronic medical record system as in Hayfa hospital, Dar Al-Salam hospital, patient friend’s hospital and Kuwait hospital or it may be handwritten on preprinted prescription forms as in the remaining NGHs. Using computerized system decrease the rate of omission errors could present. Patient name and contact information are important to ensure that correct patient receives correct drug and for maintaining patient records. Also, this information will help pharmacist to contact patient in case of any dispensing error (Ash, Berg, & Coiera, 2004).

4.3.3 Prescription information

Table (4.35): Prescription information for the NGHs in the GG

#	NGHs	Eligible hand writing (%)	Label (%)	Non-official Abb. (%)	Dosing frequency (%)	Strength (%)	Treat. length (%)	Total amount (%)	Dosage form (%)
1	**Al-Amal**	98.1	60.3	3.1	76.8	86.2	14.6	10.6	66.3
2	**Al-Awda**	91.5	31.8	10.7	69.7	78.4	33.9	13.9	49.6
3	**Al-Karama**	98.6	25.8	16.4	52.6	75.1	23.5	53.6	43.4
4	**Dar Al-Salam**	93.3	24.9	4.2	76.5	78.8	42.9	32.5	43.1
5	**Hayfa**	95.2	27.4	13.7	87	91.6	62.1	4.9	44.1
6	**Kuwait**	94.2	34.3	3.6	64	75.1	29.1	24.1	54.3
7	**PFBS**	71.6	34.2	5.2	58.2	67.4	28.9	25.1	49.9
8	**Public Aid**	86.2	27.3	14	73.1	72.6	36	26.9	54.4
9	**Yafa**	75	17	3	42.9	64.7	12.2	38.2	35.3
Total		**89.3**	**31.4**	**8.2**	**66.8**	**76.7**	**31.5**	**25.5**	**48.9**

As shown in **Table (4.35)**, The results of this study demonstrate percentage of encounters written with eligible hand writing, percentage of the study prescriptions drugs with instructions and warnings, percentage of the study prescriptions drugs with nonofficial abbreviation and percentage of the study prescriptions drugs with commission errors (Commission errors included errors related to the dose, dosage form, strength, frequency, amount and duration of the treatment) (Atif, Azeem, Sarwar et al., 2018).

With regards to hand writing eligibility, as shown in **Table (4.35)**, all the study prescriptions were handwritten, and the majority of study prescriptions (89.3%) were written clearly enough to be read by all three examiners (data collectors) which important to prevent life-threatening mistake during drug dispensing by the pharmacist. On the other hand, in the West Bank eligible and readable encounters was 95.8% (Tayem, Ibrahim, Qubaja et al., 2013). The highest percentage of the study prescriptions written with eligible and readable hand writing recorded in Al-Karama hospital 98.6% while the lowest percentage of the study prescriptions written with eligible and readable hand writing recorded in Patient Friends' Hospital 71.6%. Additionally, regarding the percentage of the study prescriptions with instructions and warnings either among the drugs prescribed or for certain drugs for patient use were around one-third 31.4% of the study prescribed drugs. In Nigeria the percentage of the study prescriptions with instructions and warnings was 10%

found in Nigeria (Akoria & Isah, 2008). The highest percentage of the study prescriptions written with instructions and warnings recorded in Al-Amal hospital 60.3% while the lowest percentage of the study prescriptions written with instructions and warnings recorded in Yafa hospital 17%. The reason of high percentage of missing instructions and warnings in the study prescriptions is that the researcher use outpatient sheets to follow the prescribers writing skills and these sheets are for physicians' usage only.

As shown in **Table (4.35)**, our result revealed a percentage of prescriptions with nonofficial abbreviations is 8.2% of the study prescriptions. Nonofficial abbreviations were found in the governmental facilities in the GG with higher percentage 87.4% (Ayoub, Musalam, & Mahadi, 2017). In the NGHs the majority of nonofficial abbreviations reported in 18% of the out-patient sheets and 27% of the discharge sheets. The highest percentage of the study prescriptions written with nonofficial abbreviations recorded in Al-Karama hospital 16.4% while the lowest percentage of the study prescriptions written with nonofficial abbreviations recorded in Yafa hospital 3%.

Using nonofficial abbreviations can lead to harmful effects and subsequently be catastrophic for the patients and their families specially when abbreviations use in drugs name by creating problems in dispensing drugs by putting the responsibility of selecting a proper drug on the shoulders of the pharmacist (Chen, Neil, Avery et al., 2005).

Regarding commission errors, **Table (4.35)** shown that the dosing frequency was written in 66.8% of the study prescriptions drugs. Our result was lower than other countries which was 84% in U.A.E. (Rasool, Fahmy, Abu-Gharbieh et al., 2010) and in Nigeria 94% (Akoria & Isah, 2008) but higher than result reported in Bahrain 19.9% (Al Khaja, Sequeira, Al-Ansari et al., 2008). The highest percentage of the study prescriptions written with dosing frequency recorded in Hayfa hospital 87% while the lowest percentage of study prescriptions written with dosing frequency recorded in Yafa hospital 42.9%.

As shown in **Table (4.35)**, the prescribed drug dose strength was specified in 76.7% of prescribed drugs. Our results were remarkably close to Brasil 76% (Ferreira, Heineck, Flores et al., 2013) while lower than in U.A.E 79% (Rasool, Fahmy, Abu-Gharbieh et al., 2010) and Nigeria 95.8% (Akoria & Isah, 2008).

In the other hand, with regards to prescribed drugs length, total amount of the prescribed drugs and prescribed drugs forms. As shown in **Table (4.35)**, the length of the treatment

was reported in 31.5 % of the study prescribed drugs. In other countries, studies reported better findings; Brasil reported 91.7% of the study prescribed drugs with length of the treatment (Ferreira, Heineck, Flores et al., 2013) and Nigeria reported 85.8% of the study prescribed drugs with length of the treatment (Akoria & Isah, 2008). The highest percentage of prescribed drugs length recorded in Hayfa Hospital 62.1% while the lowest percentage of prescribed drugs length recorded in Yafa Hospital 12.2%.

Regarding to the total amount of the drug, one-fourth of the study prescribed drugs 25.5% in the NGHs in the GG contain the quantity that the pharmacist should dispense. In Nepal drugs quantity reported in 60% of the study prescribed drugs (Ansari & Neupane, 2009). By comparing within the level of the GG NGHs, the highest percentage of prescribed drugs total amount recorded in Al-Karama hospital 53.6% while the lowest percentage of prescribed drugs total amount recorded in Hayfa hospital 4.9%.

Finally, the prescribed drugs pharmaceutical dosage forms was 48.9%, the result was remarkably better reported in brasil 91.4% (Ferreira, Heineck, Flores et al., 2013) while it was remarkably worse reported in Nigeria 14.2 % (Akoria & Isah, 2008). The highest percentage of prescribed drugs pharmaceutical dosage forms recorded in Al-Amal hospital 66.3% while the lowest percentage of prescribed drugs pharmaceutical dosage forms recorded in Yafa hospital 35.3%.

4.4 Health Facility indicators

Table (4.36): Health Facility indicators for the NGHs in the GG

Health Facility indicators	Al-Amal	Al-Awda	Al-Karama	Dar Al-Salam	Hayfa	Kuwait	PFBS	Public Aid	Yafa	Total
Availability of copy of local formulary or formulary Yes/No*	1	1	1	1	1	1	1	1	1	1
Availability of key drugs in the stock (%)	76.9	76.9	89.2	100	86.2	76.9	70.8	90.8	76.9	76.9

Yes/No*: Yes=1/No=0

4.4.1 Availability of copy of EDL or formulary

Regarding health facility indicators, none of the NGHs in the GG have a national local formulary. In our study the researcher considered the last two years stable drugs list until the time of the study for the selected NGHs is the local formulary. The result of the study revealed that all the nine NGHs had a copy of a local formulary as shown in **Table (4.36)**. This makes the overall availability100% which is much better than availability percentage of copy of local formulary in other studies. In Ethiopia one half (50%) of the study private hospitals have local formulary (Angamo, Wabe, & Raju, 2011). The overall availability for 10 health centers in Saudi Arabia was found to be 90 % (El Mahalli, 2012). However, the availability of the present study can be said to be better than a study in India where 0% availability was reported (Gopalakrishnan, Ajitha, Ganeshkumar et al., 2012). By conducting focus group with the hospital director, manager of procurement department, administration department and responsible pharmacist of each hospital to clarify the reason of selecting drugs in the local drug list. The researcher found that drugs list designed according to medical point of view regarding to hospital needs and nature of services by participation of hospital physicians, also, according to the financial point of view to ensure achieving cost effectiveness and efficiency.

4.4.2 Percent of the availability of key drugs in the stock

The researcher didn't use the key drugs model in the WHO manual because it just cover the outpatient department key drugs, so the researcher developed a key drugs list based on national drug list which match WHO key drugs list in the WHO manual 1993 (WHO,

1993) and WHO handbook 2010 (WHO, 2010a). The researcher distributed the national drug list to the 9 selected NGHs to choose the basic drugs according to their nature of services and needs as well as cover all hospital departments (ICU, outpatient, inpatient department and Emergency department). The nine participated hospitals nominated 65 drugs and consider them as a key drugs list **(Annex 10)**. The researcher made sure that the 18 key drugs mentioned in WHO manual 1993 and WHO handbook 2010 as key drugs were included in the list. Finally, the researcher redistributed the key drug list among the nine NGHs. The participated NGHs checked the availability of the key drugs during the time of data collection. The results were as follow; the overall key drugs provision among the NGHs was 76.9%, as shown in **Table (4.36)**, while in Yemen hospitals 45% (Bashrahil, 2010) and in Ethiopia hospitals 65.7% (Gidebo, Summoro, Kanche et al., 2016). As shown in **Table (4.36)** and **Figure (4.5)**, the highest percentage of key drugs availability was recorded in Dar Al-Salam hospital (100%) while the lowest percentage of key drugs availability was recorded in PFBS hospital (70.8%). Ethiopia private hospitals were recorded the following result 62.5%, 81.3%, 68.8% and 50% (Gidebo, Summoro, Kanche et al., 2016). Low key drugs availability in the local formulary hospital list was regarding to; no chronic disease clinics in NGHs because the MOH and UNRWA clinics dispense chronic diseases drugs (hypertensive and diabetic drugs) for free in the GG so the NGHs don't consider chronic disease drugs as a priority; opioid analgesics as morphine and pethidine were supplied from the MOH drugs store which in turn suffer from drugs shortage during the time of the study. As a special case, Al-Amal hospital drug supply system mainly depend on the MOH drug storage so the MOH drug shortage problem affected Al-Amal hospital drug storage directly (76.9%).

As shown in **Table (4.37),** regarding limited availability of local formulary drugs, Al-Amal hospital reported the lowest percentage of prescribing local formulary drugs 54.2%**.** Additionally, Public Aid Hospital providing the majority of drugs in the local formulary (90.8%) and reported the best compliance of physicians with hospital local formulary (97%), also, Dar Al-Salam hospital provided 100% of the local formulary drugs and the compliance with local formulary prescribing was 95% thus can indicate the good communication channels between physicians, hospital management and hospital pharmacists.

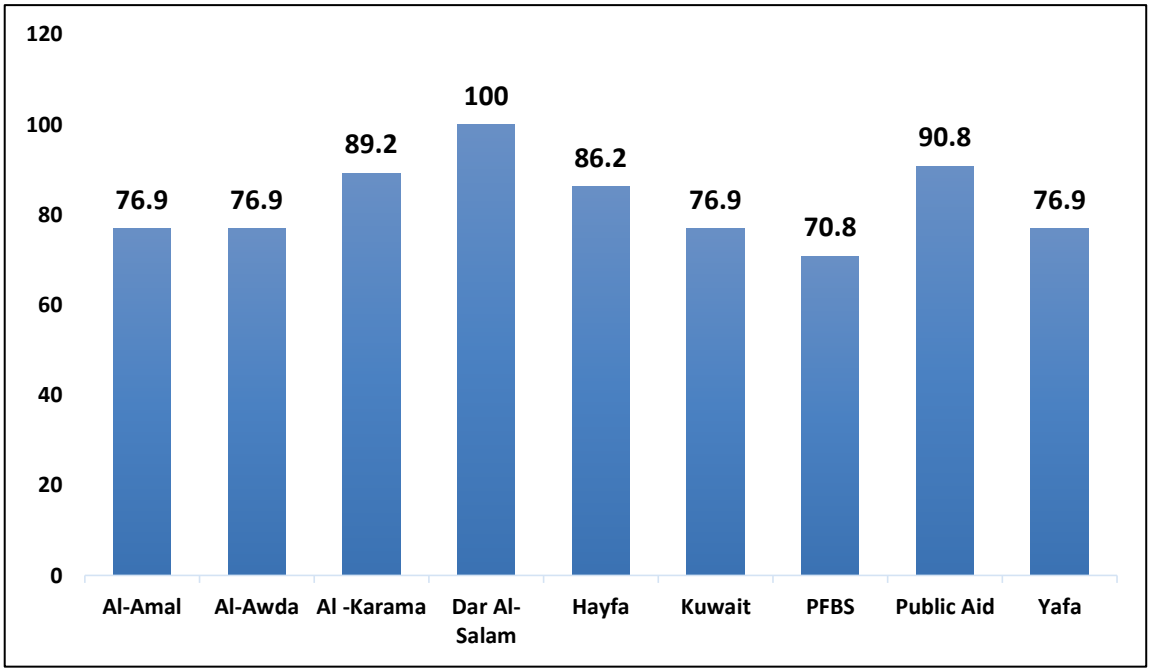

Figure (4.5): Percent of the availability of key drugs in the stock of the NGHs in the GG

Table (4.37): showed checked list of the Key drugs in the stock of the NGH in the GG during time of data collection

Table (4.37): Checked list of the Key drugs in the stock of the NGH in the GG during time of data collection

#	Drugs	Al-Amal	Al-Awda	Al-Karama	Dar Al-Salam	Hayfa	Kuwait	PFBS	Public Aid	Yafa
1	Adrenaline	1	0	1	1	0	0	0	1	0
2	Amikacin Sulphate	0	0	1	1	1	1	0	0	0
3	Aminophylline	1	0	1	1	0	0	0	0	1
4	Amlodipine	1	0	0	1	1	0	0	1	0
5	Amoxicillin	1	0	0	1	1	0	0	1	0
6	Amoxicillin + Clavulanic acid	1	0	0	1	1	0	0	1	0
7	Atenolol	0	0	0	1	0	1	1	0	0
8	Atracurium Besylate	0	0	1	1	1	1	0	1	1
9	Atropine Sulphate	0	0	1	1	1	0	1	1	1
10	Beclomethasone	1	0	1	1	1	1	1	1	1
11	Bupivacaine Hcl	0	0	1	1	1	1	1	1	1
12	Captopril	0	0	1	1	1	1	1	1	1

#	Drugs	Al-Amal	Al-Awda	Al-Karama	Dar Al-Salam	Hayfa	Kuwait	PFBS	Public Aid	Yafa
13	Ceftriaxone	0	0	0	1	1	1	0	1	0
14	Cefuroxime	0	0	1	1	0	1	0	1	0
15	Ciprofloxacin	0	0	1	1	0	0	0	0	1
16	Dexamethasone	1	1	1	1	1	1	1	1	1
17	Diazepam	1	1	1	1	1	1	1	1	1
18	Diclofenac Sodium	1	1	0	1	1	1	0	1	0
19	Enalapril	1	1	1	1	1	1	1	1	1
20	Ephedrine Hcl	1	1	1	1	1	1	1	1	1
21	Fentanyl	1	1	1	1	1	1	1	1	1
22	Ferrous sulphate + Folic acid	1	1	1	1	1	1	1	1	1
23	Fluconazole	1	1	1	1	1	1	1	1	0
24	Furosemide	1	1	1	1	1	1	0	1	1
25	Gentamicin	1	1	1	1	1	0	0	1	1
26	Glibenclamide	1	1	1	1	1	0	1	1	1
27	Glycine Irrigation	1	1	1	1	1	1	1	1	1
28	Griseofulvin	1	1	1	1	1	1	1	1	1
29	Halothane	1	1	1	1	1	1	1	1	1
30	Heparin	1	1	1	1	1	1	1	1	1
31	Hydrocortisone	1	1	1	1	1	1	1	1	1
32	Insulin	1	1	1	1	1	1	1	1	1
33	Isoflurane	1	1	1	1	1	1	1	1	1
34	Isosorbide Dinitrate	1	1	1	1	1	1	1	1	1
35	Isosorbide Mononitrate	1	1	1	1	1	1	1	1	1
36	Ketamine Hcl	1	1	1	1	1	1	1	1	1
37	Lidocaine Hcl	1	1	1	1	1	1	1	1	0
38	Magnesium Sulphate	0	1	1	1	1	1	0	1	1
39	Mebendazole	1	1	1	1	1	1	1	1	1
40	Metformin	1	1	0	1	1	1	1	1	1
41	Prednisolone	1	1	1	1	1	1	1	1	1
42	Methylene Blue	1	1	1	1	1	1	1	1	1
43	Metoclopramide	1	1	1	1	1	0	0	1	0

#	Drugs	Al-Amal	Al-Awda	Al-Karama	Dar Al-Salam	Hayfa	Kuwait	PFBS	Public Aid	Yafa
44	Metronidazole	1	1	1	1	1	1	1	1	1
45	Midazolam	0	1	1	1	1	0	0	0	0
46	Morphine	0	1	1	1	1	0	0	1	0
47	Norepinephrine	1	1	1	1	1	1	1	1	1
48	Omeprazole	0	1	1	1	1	1	1	1	1
49	Oral Rehydration Salt (O.R.S.)	1	1	1	1	1	1	1	1	1
50	Oxytocin	0	1	1	1	0	1	1	1	1
51	Paracetamol	1	1	1	1	1	1	1	1	0
52	Pethidine	0	1	1	1	0	0	1	1	1
53	Povidone Iodine	1	1	1	1	1	1	1	1	1
54	Promethazine	1	1	1	1	1	1	1	1	1
55	Propofol	1	1	1	1	1	1	1	1	1
56	Ranitidine Hcl	1	1	1	1	1	1	1	1	1
57	Salbutamol	1	1	1	1	1	1	1	1	1
58	Silver sulfadiazine	1	1	1	1	0	0	0	0	1
59	Simvastatin	1	1	1	1	1	0	0	1	1
60	Sulfamethoprim + Co-trimoxazole	1	1	1	1	1	1	1	1	1
61	Thiopental	1	1	1	1	1	1	1	1	1
62	Tramadol	1	1	1	1	0	1	1	1	1
63	Tranexamic acid	1	1	1	1	1	1	1	1	1
64	Vitamin A 500 U + Vitamin D 200 U	1	1	1	1	1	1	1	1	1
65	Warfarin Sodium	1	1	1	1	1	1	1	1	1
Total		**50**	**50**	**58**	**65**	**56**	**50**	**46**	**59**	**50**
Percent (%)		**76.9**	**76.9**	**89.2**	**100**	**86.2**	**76.9**	**70.8**	**90.8**	**76.9**

Chapter Five

Conclusion and Recommendations

4.5 Conclusion

Hence, we would like to conclude that in our study we assessed the RUD at the NGHs in the GG based on the recommended WHO core prescribing indicators, assessed prescribing writing skills and finally assessed prescriber's knowledge, attitude and practice toward hospital local formulary. Regarding physicians' attitude and practice toward local formulary, the study findings revealed that less than one half of the study participants were aware of the existence of hospital local formulary. The study findings revealed that out of total study participants who aware of the existence of hospital local formulary; two thirds of the study participants, received local formulary copy in different time manner; more than two thirds of study participants neither involved in designing nor in developing up hospital local formulary and two thirds of the study participants do not communicate with pharmacists properly or regularly. On the other hand, the study participants do not have a particular source of drug information. The most two common drug information sources were the hospital pharmacists and Internet. Two thirds of the study participants indicated hospital pharmacists as source of drug information while more than one fourth of study participants indicated Internet as source of drug information. The majority of the study participants neither never attended nor rarely attended the refreshment lecture on local formulary in the NGH. Two thirds of the study participants affected either rarely or always with patient desire, believes and expectations in writing drug prescriptions. The finding showed that more than one half of the study participants indicated positive attitude about the hospital local formulary and its benefits. Two thirds of the study participants agreed the necessity of local formulary in provision of quality health services while less than two thirds of the study participants agreed the necessity of local formulary in reducing wasting of health care resources and in preventing patient harm. Less than two thirds of the study participants agreed that local formulary selection criteria are scientifically based. Only more than one third of the study participants agreed the necessity of local formulary in including the majority of needed drugs. More than one half of the study participants shown positive practice toward prescribing drugs. More than one third of the study participants agreed that they explain treatment to the patient and mention the necessary warnings and instructions. Also, two thirds of the study participants agreed with compliance with local

formulary drugs during their prescribing practices. More than one third of the study participants agreed with using hospital-approved protocols regardless of the latest protocols. Additionally, more than one half of the study participants agreed with prescription drugs based on the drugs available at the hospital pharmacy. Less than one half of the study participants agreed that they keep permanent communication with the pharmacist to find out the available drugs. Less than one half of the study participants didn't receive any copy of hospital local formulary (soft copy or hard copy). In fact, hospital pharmacists committee in all NGHs are the responsible entity for setting up hospital local formulary except Al-Awda hospital which have a hospital DTC consist of hospital specialists and pharmacists. More than one third of the study participants chose hospital DTC which was a correct answer for Al-Awda hospital only. Less than one fourth of the study participants chose correctly hospital pharmacy committee which indicate a huge gab in the participants knowledge about the responsible entity for setting up hospital local formulary. The majority of the study participants felt that they were not encouraged properly by hospital management to be compliant with local formulary drugs. Although all NGHs managements did not conduct any lecture or training program on local formulary in the hospitals except Al-Awda hospital use generalizations instead of lecture or training program on local formulary content among physicians in regular time. One third of the study participants thought that the hospital management arrange lectures or training programs on local formulary and the majority of the study participants didn't receive any training on local formulary content and concept. All these findings toward NGHs management efforts in hospital local formulary in the hospital clearly investigate the poor communication channel between the hospital managements and the prescribers. More than two thirds of the study participants know that hospital local formulary update routinely as well as receiving local formulary copy in different time manner. Less than one half of the study participants received copy of local formulary yearly. The majority of the study participants have not received appropriate feedback from the hospital management about their compliance with local formulary. Less than one half of the study participants indicated that no action was taken against physicians who didn't compliance with local formulary. These results indicated weak monitoring and evaluation system in the NGHs. On the other hand, there was a negative perception toward hospital management efforts. The majority of the study participants were either uncertain or declined the existence of monitoring system in the hospital to measure physician's compliance with local formulary drugs. The majority of the study participants were either uncertain or declined the

followings; the presence of monitoring system to assess physician's compliance with the treatment protocols, the effectiveness of current hospital monitoring and evaluation system, the compliance with the treatment protocol affects the performance appraisal, the existence of performance indicators on their compliance with the current treatment protocols and the providing list of the current available drugs at the hospital pharmacy. Unexpectedly, more than two thirds of the study participants were agreed that they describe unnecessary treatments due to near expire date of the available drugs in the hospital pharmacy, this happen after distribution the near expiry date drugs list which were available in the hospital. Although the NGHs don't have neither therapeutics committee as a source for the treatment protocols nor treatment protocols. One fourth of the study participants confirmed the presence of treatment protocols in the hospital. One half of those who confirmed the presence of treatment protocols in the hospital, confirmed that protocols location is hospital ward. Also, one third of the study participants confirmed that the most common source of the treatment protocols is therapeutics committee in the hospital and one third of the study participants confirmed that text book is the second source. Additionally, less than one half of the study participants confirmed that treatment protocols matching hospital local formulary and two thirds of the study participants confirmed that they rarely or didn't receive any written treatment protocols. These findings reflect how much the prescribers don't know the reality status of the management system in the NGHs and thought that the NGHs have the same managements system in the governmental hospitals. Regarding attitude toward treatment protocol in the hospital. one half of the study participants showed positive attitude. More than one-half of the study participants were agreed that drugs included in the treatment protocols are effective, compliance with treatment protocols reducing total health cost and unexpectedly local formulary drugs are included in the treatment protocols are less effective than others while less than one half of the study participants were agreed the treatment protocols are obligatory for participants in the work.

The findings of the study have shown that the NGHs recorded results more than WHO recommendations in the following: average number of drugs prescribed per encounter, encounters with injection as well as encounter with antibiotic. While The findings were less than WHO recommendations in the using generic name of drugs in prescription and prescribing drugs from hospital local formulary. Our study found that most of prescribed drugs related to analgesic groups and antibiotics groups. NSAID was the most common

analgesic group while third generation of cephalosporin is the most common antibiotic group was prescribed. Regarding complementary indicators the average drug costs per encounter in the NGHs was around eleven dollars and approximately half of the drug costs in the selected the NGHs spent on antibiotics. The using of antimicrobials was negligible. Regarding prescriber information, less one half of encounter were with prescriber name, more than one third with prescriber stamp, more than two thirds with prescriber signature and more than half of encounters with clean mention for prescriber's specialty. The study findings revealed that the majority of encounters with patient name, patient age and prescriptions date. Additionally, more than two thirds of encounters with patient address while more than one half of encounters with patient telephone. For prescribing writing skills, the NGHs in the GG reported omission errors in prescriber information and patient's information. Regarding prescriber information, more than half of the study prescriptions were omitted name, two thirds of the study prescriptions were omitted stamp, more than one third of the study prescriptions were omitted signature and specialty. On the other hand, patient information recorded omission error as follow; in more than one third of the study prescriptions were omitted patient address, less than one half of the study prescriptions were omitted patient telephone, less than one fourth of the study prescriptions were omitted patient age while almost study prescriptions were with good compliance in recording patient name and date of prescription. Additionally, regarding prescription information, the majority of the study prescriptions were with eligible and readable hand writing, around one third of the study prescriptions with instructions and warnings, the majority of the study prescriptions were without non-official abbreviations. Regarding commission errors, more than two thirds of the study prescriptions were with dosing frequency and strength, around one third of the study prescriptions with treatment length, around one fourth of the study prescriptions with total amount and finally less than one half of the study prescriptions with dosage form.

Finally, regarding availability of copy of hospital local formulary, all the NGHs have hospital local formulary copy because the researcher considered the last two years local formulary for the hospital is the hospital local formulary while the availability of key drugs in the stock during the time of data collection range from moderate to complete.

4.6 Recommendation

1. The hospital managements of the NGHs need to develop appraisal form for the physicians to assess periodically to identify any defects and introduce corrective measures such as educational programmes on rational prescribing, followed by reminders and feedback to assess the physicians' response.
2. The hospital managements of the NGHs need to develop annual appraisal form for the hospital management performance and how much they match WHO health facility and patient care indicators.
3. Forcing functions and constraints they allow for designing processes to ensure that errors are virtually impossible or at least difficult to make. Examples include software programs with "forcing functions "that require the entry of additional pertinent patient information before the order is completed and the medication is dispensed. Automation and computerization of medication use processes and tasks can lessen human fallibility by limiting reliance on memory.
4. Policy makers, decision makers and healthcare professionals should implement and support policies and programmes to reduce inappropriate drug use as antibiotic and analgesics, preventing antibiotic resistant and over use analgesic health problems while at the same time lowering costs and improving health outcomes.
5. Under supervision of WHO Gaza office, training specialist of the international and local non-governmental organization who work in health field as JUZOOR for Health & Social Development which can conduct trainings for rational use of drugs and local formulary concept and content in the NGHs.
6. The quality and nature of prescriptions written in the GG is substandard and it requires use of a standardized prescription format to be used. Also, regarding legibility, computerization can be the answer to the problem.
7. The hospital managements of the NGHs need to improve the role of Monitoring and auditing system, especially to improve physician's compliance with local formulary.
8. With good integration from hospital managements of the NGHs with MOH to arrange continuous education and training programs for healthcare staff concerning local formulary and treatment protocols especially for new graduation physicians. Hospital managements of the NGHs needs to identify training priority areas that physicians need to attain during their work.

9. There is a need to improve the communication among the hospital managements of the NGHs.
10. Develop hospital DTC and involve hospital specialists and pharmacists in the updating process of hospital local formulary.

4.7 Further research

1. Conduct research including both qualitative and quantitative methods for NGHs in the West Bank.
2. Conduct research including both qualitative and quantitative methods to compare patient care indicators in the governmental hospital and NGHs in the GG.

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Annexes

Annex (1): Helsinki Committee research approval

المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار
Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 2017/08/07 **Number:** PHRC/HC/235/17

Name: HANEEN M. TAHA الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Rational Use of Drugs at the Non-Governmental Health Facilities in Gaza Governorates

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/235/17 in its meeting on 2017/08/07 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Chairman

Genral Conditions:-
1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين
شارع النصر - مفترق العيون

Annex (2) Sample of the NGHs approval

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ 2017/10/14

حضرة / د. حسن خلف المحترم
مدير مستشفى أصدقاء المريض

تحية طيبة وبعد،،،

الموضوع:مساعدة الطالبة حنين طه

نشكر لكم دعمكم الدائم لمسيرة العلم والتعليم وخصوصاً دعم كلية الصحة العامة وطلابها، ونود أعلامكم بأن الطالبة المذكورة أعلاه تقوم بعمل بحث كمتطلب للحصول على درجة الماجستير في الصحة العامة–مسار علم الأوبئة عنوان:

Rational Use of Drugs at the Non-governmental Health Facilities in Gaza Governorates

وعليه نرجو من سيادتكم التكرم بالموافقة على تسهيل مهمة الطالبة في إنجاز هذا البحث حيث تشمل عينة الدراسة تعبئة نموذج ملاحظة من الملفات الطبية للمرضى ونماذج الوصفات الطبية وكذلك تعبئة استبانة مع عدد من الاطباء العاملين في اقسام الرعاية الصحية الثانوية بمستشفى أصدقاء المريض التابع لإدارتكم الموقرة.

شاكرين لكم حسن تعاونكم ودعمكم للمسيرة التعليمية،،،
و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد
منسق عام برامج الصحة العامة
جامعة القدس–فرع غزة

نسخة: الملف

Jerusalem Branch/Telefax 02-2799234
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P.O. box 51000 Jerusalem

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ص.ب. 51000 القدس

Annex (3): Describes the activities of the research and expected duration for each activity

		2017										2018					
Activity	**Duration**	**March**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Octo.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**March**	**April**	**May**	**June**
Proposal writing	**2 months**																
Proposal defense and approval	**2 months**																
Prep. period	**2 months**																
Pilot study	**1 month**																
Data collection	**4 months**																
Data entry	**4 months**																
Data analysis	**4 months**																
Thesis writing	**3 months**																

Annex (4) Shows WHO data collection forms (prescribing indicator form)

Location:…….. Facility name:……

Investigator:…….. Date:…….

Seq. #	Type R/P	Date of Rx	Age (yrs)	# Drugs	# generic	Antibiotic (0/1) *	Injection (0/1) *	# on local formulary	Diagnosis (optional)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
TOITAL									
AVERAGE									
PERCENTAGE									

***0=No 1=Yes**

Annex (5) Shows WHO data collection forms

Location:…….. Facility name:……
Investigator:…….. Date:…….

Seq. #	Type R/P	Date of Rx	# Drugs	Actual cost of Drugs	Antibiotic name	Actual cost of antibiotic	Antibiotic (0/1) *	Antibiotic Injection (0/1) *	# on local formulary	Diagnosis (optional)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
TOTAL										
AVERAGE										
PERCENTAGE										

***0=No 1=Yes**

Annex (6) Shows WHO data collection forms (antimicrobial prescribing indicator form).

Location:…….. Facility name:……
Investigator:…….. Date:…….

Seq. #	Type R/P	Date of Rx	# Drugs	Actual cost of drugs	Antimicrobial (0/1) *	Antimicrobial name	Actual cost of antimicrobial drug	Diagnosis (optional)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
TOITAL								
AVERAGE								
PERCENTAGE								

***0=No *1=Yes**

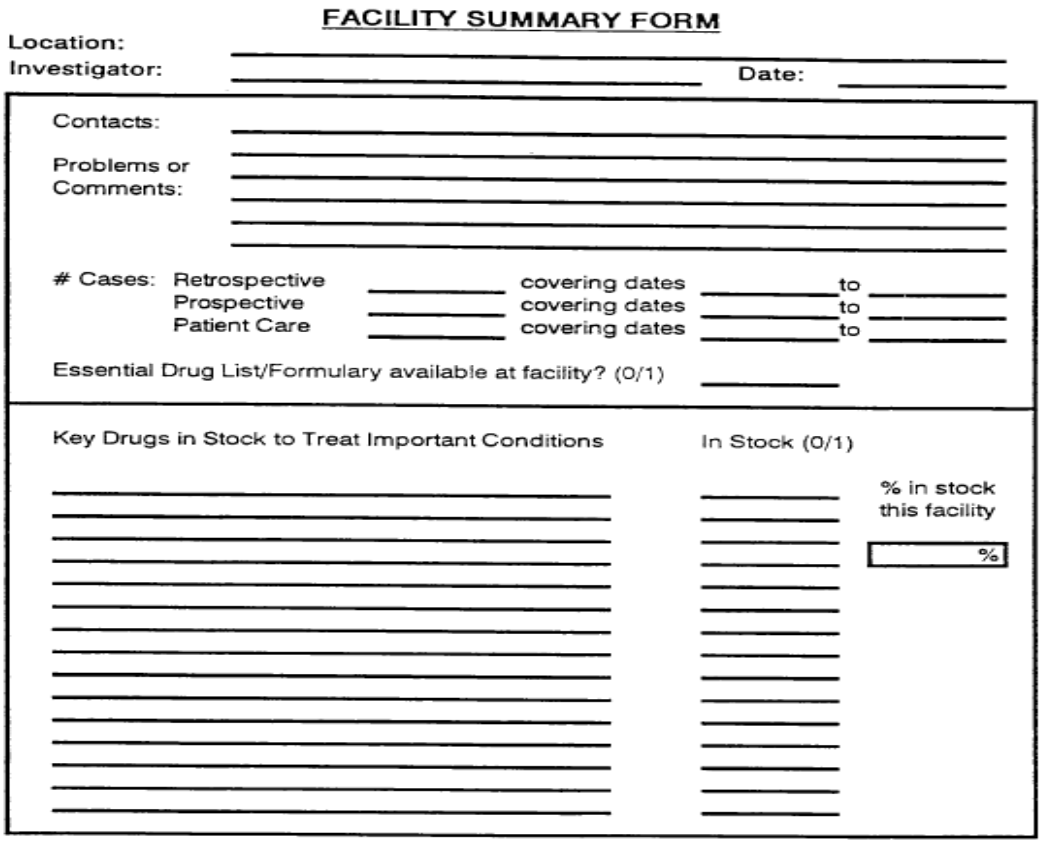
Annex (7) Shows Antimicrobial classification for prescribing indicators

Table 2
Antimicrobial classification for prescribing indicators

Count as antibiotic	Code in WHO Model List	Class
	6.1.3	Antifilarials
	6.1.4	Antischistosomals
yes	6.2.1	Penicillins
yes	6.2.2	Other antibacterials
	6.2.3	Antileprosy drugs
	6.2.4	Antituberculosis drugs
	6.3	Antifungal drugs
	6.4.1	Antiamoebic and antigiardiasis drugs
	6.4.2	Antileishmaniasis drugs
	6.4.3	Antimalarial drugs
	6.4.4	Antitrypanosomal drugs
yes	13.2	Anti-infective dermatological drugs
yes	21.1	Anti-infective ophthalmological agents
yes	*	Antidiarrhoeal drugs with streptomycin, neomycin, nifuroxazide or combinations

* Not on WHO Model List of Essential Drugs

Annex (8) Shows WHO data collection forms (Facility summary form).



FACILITY SUMMARY FORM

Location: _____

Investigator: _____ Date: _____

Contacts: _____

Problems or Comments: _____

Cases: Retrospective _____ covering dates _____ to _____

Prospective _____ covering dates _____ to _____

Patient Care _____ covering dates _____ to _____

Essential Drug List/Formulary available at facility? (0/1) _____

Key Drugs in Stock to Treat Important Conditions	In Stock (0/1)

% in stock this facility: _____ %

Annex (9) Observational checklist for prescribing writing skills

No	Prescriber				Prescription						Patient		
	Name	address	Telephone	signature	Data	Generic name	Strength	Dosage form	Total amount	Label (instructions, warnings)	Name	Address	Age
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													

Annex (10) The self- developed Key drugs lists in NGHs in the GG.

#	Drugs	#	Drugs	#	Drugs
1	Adrenaline	23	Fluconazole	45	Midazolam
2	Amikacin Sulphate	24	Furosemide	46	Morphine
3	Aminophylline	25	Gentamicin	47	Norepinphrine
4	Amlodipine	26	Glibenclamide	48	Omeprazole
5	Amoxicillin	27	Glycin Irrigation	49	Oral Rehydration Salt (O.R.S.)
6	Amoxicillin +Clavulanic acid	28	Grisofulvin	50	Oxytocin
7	Atenolol	29	Halothane	51	Paracetamol
8	Atracurium Besylate	30	Heparin	52	Pethidine
9	Atropine Sulphate	31	Hydrocortisone	53	Povidone Iodine
10	Beclometason	32	Insulin	54	Promethazone
11	Bupivacaine Hcl	33	Isoflurane	55	Propofol
12	Captopril	34	Isosorbide Dinitrate	56	Rantidine Hcl
13	Ceftriaxone	35	Isosorbide Mononitrate	57	Salbutamol
14	Cefuroxime	36	Ketamine Hcl	58	Silver Sulphadiazine
15	Ciprofloxacin	37	Lidocaine Hcl	59	Simvastatin
16	Dexamethasone	38	Magnesium Sulphate	60	Sulfamethoprim + Co-trimoxazole
17	Diazepam	39	Mebendazole	61	Thiopental
18	Diclofinac Sodium	40	Metformin	62	Tramadol
19	Enalapril	41	Prednisolone	63	Tranexamic acid
20	Ephedrine Hcl	42	Methylene Blue	64	Vitamin A as Palmitate 500 U+ Vitamin D 200 U
21	Fentanyl	43	Metoclopramide		
22	Ferrous sulphate + Folic acid	44	Metronidazole	65	Warfarin Sodium

Annex (11): The questionnaire and the consent form in Arabic version:

بسم الله الرحمن الرحيم

الموافقة على إجراء استبيان حول دراسة:

دراسة تقييم مدى الاستخدام الرشيد للأدوية في المنشآت الصحية غير الحكومية في محافظات غزة

أنا الباحثة: حنين محمد طه، طالبة في برنامج ماجستير الصحة العامة في جامعة القدس، أقوم بعمل بحث علمي وهو جزء من دراستي في الجامعة يهدف دراسة مدى الاستخدام الرشيد للأدوية في المنشآت الصحية غير الحكومية في محافظات غزة. حيث أن النتائج قد تؤدي الي تحسين الخدمات الصحية.

هناك خيارات للإجابة عن كل سؤال، الرجاء اختيار الإجابة الأقرب إليك ولممارستك الواقعية، مع العلم انه لا توجد إجابات خاطئة وإجابات صحيحة.

المشاركة في هذا البحث تطوعية ولك الحق في الانسحاب متى تشاء مع التأكيد على سرية المعلومات.

الاستبيان قد يستغرق حوالي 15 دقيقة.

أقدر عاليا مشاركتك في البحث.

وتفضلوا بقبول جزيل الشكر

استبيان دراسة تقييم مدى الاستخدام الرشيد للأدوية في المنشآت الصحية غير الحكومية في محافظات غزة.

التاريخ :.2018/...../.....	**الرقم المتسلسل .....**

1. الجنس:
☐ أنثى ☐ ذكر

2. العمر: ..... سنة

3. الحالة الاجتماعية:
☐ أعزب ☐ أرمل ☐ مطلق ☐ متزوج

4. مكان السكن (المحافظة):
☐ شمال غزة ☐ غزة ☐ المنطقة الوسطى ☐ خانيونس ☐ رفح

5. الدرجة العلمية (آخر شهادة حصلت عليها):
☐ بكالوريوس طب ☐ دبلوم عالي ☐ ماجستير ☐ زمالة / بورد ☐ دكتوراه

6. التخصص:

☐ طب عام ☐ باطنة ☐ جراحة عامة ☐ أطفال ☐ انف وأذن وحنجرة
☐ عظام ☐ قلب ☐ نساء ومتابع حمل ☐ الطوارئ ☐ أسنان

7. المسمى الإشرافي:
☐ مدير دائرة ☐ رئيس قسم ☐ رئيس شعبة ☐ بدون

8. اجمالي عدد سنوات العمل (الخبرة) في جميع المستشفيات:.....سنة.

9. حسب معرفتك هل يوجد قائمة بالأدوية الأساسية في المستشفى غير الحكومي الذي تعمل فيه؟ (إذا كانت اجابتك بلا او لا أعرف انتقل للسؤال 21):
☐ نعم ☐ لا ☐ لا أعرف

10. هل حصلت على تدريب حول قائمة الأدوية الأساسية في المستشفى الذي تعمل فيه؟
☐ نعم ☐ لا

11. حسب معرفتك هل يتم تحديث قائمة الأدوية الأساسية الخاصة بالمستشفى الذي تعمل فيه؟
☐ نعم ☐ لا ☐ لا أعرف

12. هل تحصل على نسخة من قائمة الأدوية الأساسية الخاصة بالمستشفى؟
☐ سنوياً ☐ ك سنتين ☐ لا أحصل ☐ غير ذلك

13. هل شاركت في اعداد وتحديث قائمة الأدوية الأساسية الخاصة بالمستشفى الذي تعمل به؟
☐ نعم ☐ لا

14. يوجد لديك نسخة من قائمة الادوية الاساسية الخاصة بالمستشفى:
☐ ورقية ☐ الكترونية ☐ الكترونية + ورقية ☐ لا يوجد

15.

15. تحديث قائمة الأدوية الأساسية الخاصة بالمستشفى تتم بواسطة:
☐ لجنة الصيدلية والعلاجات بالمستشفى ☐ لجنة مركزية بالمستشفى ☐ الصيدلية
☐ المدير الطبي ☐ وزارة الصحة ☐ لجنة خارجية
☐ لجنة داخلية وخارجية ☐ قسم المشتريات ☐ لا أعرف

16. تقوم إدارة المستشفى بحثك على التقييد بوصف الأدوية المدرجة بالقائمة الأساسية:
☐ دائماً ☐ أحياناً ☐ لا

17. تقوم إدارة المستشفى بتنفيذ برامج تدريب ومحاضرات بخصوص قائمة الأدوية الأساسية بالمستشفى:
☐ نعم ☐ لا ☐ لا أعرف

18. تشارك في المحاضرات التنشيطية الخاصة بقائمة الأدوية الأساسية:
☐ نعم ☐ أحياناً ☐ لا

19. تقوم إدارة المستشفى بمراجعتك في حال عدم التزامك بقائمة الأدوية الأساسية بالمستشفى:
☐ دائماً ☐ أحياناً ☐ لا

20. تقوم إدارة المستشفى باتخاذ اجراء أياً كان نوعه لمن يخالفون بشكل تلقائي او متعمد لأصناف قائمة الأدوية الأساسية:
☐ نعم ☐ لا ☐ لا أعرف

21. تقوم بإبلاغ صيدلية المستشفى بقائمة الأدوية الأساسية التي تحتاجها لعلاج المرضى خلال عملك بالمستشفى:
☐ دائماً ☐ أحياناً ☐ لا أبلغ أحداً

22. يوجد في العمل بروتوكولات علاجية معتمدة ومكتوبة: (إذا كانت اجابتك بلا او لا أعرف انتقل للسؤال 27):
☐ نعم ☐ لا ☐ لا أعرف

23. حدد مكان وجود البروتوكولات العلاجية ان وجدت:
☐ في مكتبة المستشفى ☐ في القسم ☐ في الصيدلية
☐ لا أعرف ☐ أخرى /حدد: .....

24. مصدر البروتوكولات العلاجية:
☐ مدير المستشفى ☐ لجنة الصيدلة والعلاجيات ☐ كتب ومراجع علمية ☐ لا أعرف

25. تنسجم البروتوكولات العلاجية مع قائمة الأدوية الأساسية الخاصة بالمستشفى:
☐ دائماً ☐ أحياناً ☐ لا

26. تصلك البروتوكولات بتعميمات مكتوبة من إدارة المستشفى لحثك على الالتزام بها:
☐ نعم ☐ أحياناً ☐ لا

27. في حال كنت بحاجة لمعلومات دوائية مستعجلة تخص الدواء تقوم بالاستعانة بـــ:
☐ صيدلي من المستشفى ☐ صيدلي مندوب دعاية ☐ انترنت (Internet)
☐ اقرأ من مرجع علمي ☐ زميل ☐ أخرى /حدد:.....

28. تلعب رغبة المريض دوراً في وصف العلاج اللازم:
☐ دائماً ☐ أحياناً ☐ لا

ما مدى تأييدك لما ورد في العبارات التالية

العبـــــــــــــــارة	غير موافق بشدة	غير موافق	لا أدري /محايد	موافق	موافق بشدة
29. وجود قائمة الأدوية الأساسية ضروري لتقديم خدمة صحية ذات جودة عالية.					
30. وجود قائمة الأدوية الأساسية يقلل من هدر الموارد المالية المخصصة للأدوية.					
31. وجود قائمة الأدوية الأساسية يقلل من الضرر الذي قد يصيب المريض.					

العبـــــــــــــــــارة	غير موافق بشدة	غير موافق	لا أدري /محايد	موافق	موافق بشدة
32. معايير اختيار الأصناف ضمن قائمة الأدوية الأساسية معايير علمية وصحيحة.					
33. قائمة الأدوية الأساسية تلبي أغلب الاحتياجات اللازمة لوصف العلاج الذي يحتاجه المريض.					
34. في حال وجود بروتوكول علاجي بالمستشفى، فإن الأدوية المذكورة به مناسبة.					
35. البروتوكولات العلاجية ملزمة لي خلال العمل.					
36. الالتزام بالبروتوكولات العلاجية المعتمدة بالمستشفى يقلل من التكلفة المالية للخدمة.					
37. الأدوية الموجودة في البروتوكولات العلاجية أقل فاعلية من الأدوية الأخرى.					
38. يوجد في المستشفى نظام تدقيق ومراقبة لمعرفة مدى التزام الطبيب بوصف أصناف قائمة الأدوية الأساسية.					
39. يوجد في المستشفى نظام متابعة وتدقيق لمعرفة مدى التزام الطبيب بالبروتوكولات العلاجية.					
40. نظام المتابعة والتدقيق في المستشفى فعال وذو كفاءة.					
41. التزامك بوصف الأدوية حسب البروتوكولات العلاجية يؤثر على التقييم السنوي لأدائك الوظيفي.					
42. يوجد بالمستشفى مؤشرات لقياس مدى التزام الأطباء بالبروتوكولات العلاجية.					
43. تقوم بشرح كيفية أخذ الدواء للمريض وذكر التحذيرات والتنبيهات اللازمة.					
44. تلتزم بوصف أدوية من قائمة الأدوية الأساسية للمستشفى.					
45. استخدم البروتوكولات العلاجية المقرة بالمستشفى بغض النظر عن أحدث البروتوكولات العلاجية.					
46. يعتمد وصفي للعلاج على الأدوية المتوفرة في صيدلية المستشفى.					
47. اتواصل بشكل شخصي ودائم مع صيدلي المستشفى لمعرفة ما هي الادوية المتوفرة في صيدلية المستشفى.					
48. تقوم إدارة المستشفى بحثي على وصف بعض العلاجات غير اللازمة بغرض صرفها قبل انتهاء موعدها.					
49. تقوم إدارة المستشفى بتزويدنا بشكل دوري بقائمة الادوية المتوفرة بصيدلية المستشفى.					

مع تحيات الباحثة: حنين محمد طه

Annex (12): Experts and professional consulted

1. Dr. Bassam Abu Hamad, Al Quds University
2. Dr. Yehia Abed, Al Quds University
3. Dr. Khitam Abu Hamad, Al Quds University
4. Dr.Adnan AlWhaidi Pediatrics specialist
5. Dr.Hala Al Agha; AlAzhar University
6. Dr.Mahmoud Taleb; Al-Azhar University
7. Dr.Ihab AlMasri; Al-Azhar University
8. Dr.Naser Abu Jaser.UNRWA
9. Dr.Jahad Matar; Al-Quds Open University
10. Dr.Nancy Nashwan; Al-Quds Open University

Annex (13) describes the actual sample distribution and data collection plan

Area	Total sample (3600)	# of NGHs	Sample distribution											
			Month 1			Month 2			Month 3			Month 4		
			1-10	11-20	21-30	1-10	11-20	21-30	1-10	11-20	21-30	1-10	11-20	21-30
North	360	1												
Gaza	1800	5												
Middle Area	360	1												
Khan-Younis	720	2												
Rafah	360	1												
Total	3600	10												

Abstract in Arabic

العنوان: تقييم مدى الاستخدام الرشيد للأدوية في المنشآت الصحية غير الحكومية في محافظات غزة.

إعداد الباحثة/ حنين محمد طه.

إشراف/ د. شيرين أيوب.

ملخص

يعتبر الاستخدام غير الرشيد للأدوية بمثابة المصدر الرئيسي لإهدار الموارد في المجال الصحي حيث شجعت منظمة الصحة العالمية البلدان على تعزيز الاستخدام المناسب للدواء والتي يمكن من خلالها توفير 5% من إجمالي النفقات الصحية للدول.

هدفت الدراسة لمعرفة مدى اتباع الأطباء للمعايير التي وضعتها منظمة الصحة العالمية كمؤشرات لصرف الدواء، كما هدفت الدراسة إلى تقييم الممارسات المتعلقة بالوصف الدوائي وتقيم لتقييم مدى معرفة الأطباء العاملين في المستشفيات غير الحكومية وممارساتهم المتعلقة بقائمة الأدوية الأساسية.

الدراسة عبارة عن دراسة وصفية تحليلية شملت البيانات الكمية باستخدام ثلاثة أدوات أولها استبانة يتم تعبئتها بواسطة الأطباء لتقييم مدى معرفة الأطباء وممارساتهم المتعلقة بقائمة الأدوية الأساسية بالإضافة إلى نماذج متفق عليها من قبل منظمة الصحة العالمية لقياس مؤشرات صرف الدواء تختص بتدوين الأدوية التي قام بوصفها الأطباء في الوصفات الطبية وممارساتهم المتعلقة بالوصف الدوائي. وأخيراً تم وضع قائمة بالأدوية الرئيسية المقترحة استناداً إلى قائمة أدوية الطوارئ في مستشفيات وزارة الصحة والمتضمنة للأدوية الرئيسية المقترحة من منظمة الصحة العالمية. تم جمع 198 استبانة ذاتية التعبئة من الأطباء. 1130 وصفة لمريض منوم، 898 وصفة خروج مريض منوم، 998 وصفة لمريض من عيادة خارجية. تم تحليل البيانات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS) حيث أجريت التوزيعات والترددات والنسب المئوية والجداول كما حسبت النسب المئوية المتوسطة والعامة وجداول المتقاطعة وتم استخدام One way Anova و Chi square testلإيجاد العلاقات بين المتغيرات.

أظهرت نتائج الدراسة أن هناك موقف إيجابي لدى الأطباء حول قائمة الأدوية الأساسية وفائدتها حيث اتفق أغلبية المشاركين في الدراسة على أهمية قائمة الأدوية الأساسية لتقديم خدمة صحية عادلة، ذات جودة، وكذلك للحد من هدر الموارد المالية، والحد من حدوث ضرر للمريض، واجمعوا على حقيقة أن اختيار الأدوية المدرجة في قائمة الأدوية الأساسية يتم على أسس علمية، ولكن كان هناك موقف إيجابي حول التزامهم بأدوية القائمة الأساسية عند كتابة الوصفات. كما أجمع غالبية المشاركين فالدراسة أنهم ليسوا على تواصل مع صيادلة المستشفى بشكل صحيح. وقد أظهرت النتائج إجماعاً من قبل المشاركين في الدراسة بأن الجهود المبذولة من قبل إدارة المستشفى غير كافية في تشجيع الأطباء على الالتزام بوصف أدوية قائمة الأدوية الأساسية وكذلك إهمال إدارة المستشفيات في توفير بروتوكولات علاجية.

كما أظهرت الدراسة أن متوسط عدد الأدوية التي توصف في الوصفات الطبية للمرضى بلغت معدل (2.5) دواء في كل وصفة طبية. كما بلغت نسبة وصف كل من المسكنات بمختلف أنواعها (38.9%) تليها المضادات الحيوية بنسبة (33.9%) من المجموع الكلي للأدوية الموصوفة في الدراسة. وبلغت نسبة الوصفات المحتوية على مضاد حيوي (67.9%)، وما يقارب ثلث الوصفات تحتوي على حقن (30.2%)، بلغت نسبة الأدوية الموصوفة بالاسم العلمي (3.3%)، بلغت نسبة الأدوية الموصوفة والمتوافقة مع قائمة الأدوية الأساسية الخاصة بالمستشفى (88.7%) من المجموع الكلي للأدوية الموصوفة. كما بلغ متوسط سعر الوصفة الطبية ($10.9)، وأن اقل من نصف مجموع أسعار الدواء تم صرفه على المضادات الحيوية. من ناحية أخرى؛ فيما يتعلق بمهارات كتابة الوصفات الطبية، أظهر الأطباء التزاماً جيداُ فيما يخص كتابة المعلومات الخاصة بالطبيب في الوصفة الطبية أما بالنسبة للمعلومات الخاصة بالمريض والوصف الدوائي فقد ظهر عدم التزام بكتابتها في الوصفات الطبية. على الجانب الآخر فقد تراوحت نسبة الأدوية المتوفرة من قائمة الأدوية الرئيسية من (70.8%) إلى (100%).

خلصت الدراسة إلى أن هناك حاجة ملحة لتوفير قائمة أدوية أساسية وبروتوكولات علاجية في كل مستشفى والعمل على تنفيذ برنامج تدريبي مستمر بخصوص التعريف بقائمة الأدوية الأساسية والبروتوكولات العلاجية للكوادر الطبية، لتوزيع نسخ ورقية وإلكترونية لقائمة الأدوية الأساسية، تفعيل نظام المتابعة والنظام المحوسب من قبل إدارة المستشفى لتحسين أنماط صرف الأدوية لدى الأطباء. كما تظهر الحاجة الماسة لإجراء المزيد من الأبحاث الكمية والكيفية حول المؤشرات الخاصة برعاية المريض في المنشآت الحكومية والخاصة في قطاع غزة على حد سواء.