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Al-Quds University

School of Public Health

**Drugs Prescribing Patterns and Practices at UNRWA Health
Centers – Gaza Governorates**

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Drugs Prescribing Patterns and Practices at UNRWA Health Centers – Gaza Governorates

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Dedication

I would like to express my appreciation and gratitude to my family, particularly my husband Without his understanding, support and encouragement the thesis would not have been completed.

I would like to thank my sons and my daughters for their patience.

Lot of thanks and love to my parents who never stopped encouraging me, to my sisters and brothers who believed in me..

To everyone who contributed to get this study a reality, thank you.

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First of all, praise be to Allah, the lord of the world, and peace and blessings of Allah be upon the noblest of all Prophets and messengers, our prophet Muhammad, all thanks for Allah who granted me the help and capability to complete this thesis.

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Mona El-Baba

April, 2012

Declaration

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

Signature:

Mona el Baba

Abstract

The practice of rational drug prescribing is of great importance for the safety of patients and the health facility expenditure. This study aimed to examine prescription patterns among prescribers working at UNRWA health centers and to determine their level of adherence to WHO standards of drug use indicators.

The population of the study consisted of 157 prescribers and the sample size was 121 prescribers (85 males and 36 females), with response rate 77.07% and 1621 prescriptions from all UNRWA health centers in Gaza Strip. For data collection, constructed, self administered questionnaire and checklist for drug indicators were used.

For data analysis, the researcher used frequencies, means, standard deviation, Chi square and One way ANOVA test.

The results showed that 88% of study participants reported knowing the meaning of essential drugs, 89.9% knew the meaning of generic name, 59.2% knew the generic name for all prescribed drugs.

33.3% knew the generic name for most of the drugs and 88.1% were familiar with the concepts of standards treatment guidelines.

Only 23.5% used generic name very often, 55.5% used generic name often and only 23.3% received training about prescribing patterns. Also, 88.4% reported that a copy of EDL was available, 84.9% were using the EDL, of them, 92.4% found that EDL was easy to be used.

Regarding shortage of drugs, 65.3% of study participants said that they experienced shortage of drugs and 64.4% reported that the main shortage was in antibiotics followed by dermatological drugs (34.2%) and NSAIDs (31.5%).

The majority of study participants 89.1% said that there is a monitoring system for prescribing of drugs, 82.5% said that there is a written technical instructions for prescribing, only 20.2% received written feedback and 46.2% received verbal feedback regarding their practice. Concerning drug use indicators, the mean number of prescribed drugs was 2.77 per prescription, percentage drugs prescribed by generic name was 24.5, percentage of prescribed antibiotics was 32.9, percentage of drugs prescribed from EDL was 98.37 and percentage pf prescribed injections was 3.1.

The results indicated that the highest rate of prescribing drugs in general and from EDL was from North governorate, the highest number of prescribed drugs was in general files ($m = 2.82$) and the lowest was in mother files ($m = 2.70$). The highest rate of prescribing drugs was in the third 10 days of the month ($m = 2.96$).

The study concluded that further educational activities should be taken to achieve rational prescribing and standards of drug use indicators.

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List of Abbreviations

CDUIs	Core Drug Use Indicators
CFHP	Chief Field Health Program
EDL	Essential Drug List
GPs	General Parishioners
GS	Gaza Strip
KAP	Knowledge, Attitudes and Practice
INRUD	International Network for the Rational Use of Drugs
MOH	Ministry Of Health
NDP	National Drug Policy
NGOs	Non Governmental Organization
NSAIDs	Non-steroidal Anti-inflammatory Drugs
PCBS	Palestinian Center Bureau of Statistics
PHC	Primary Health Center
PNA	Palestinian National Authority
PNF	Palestinian National Formulary
SPSS	Statistical Package for Social Sciences
STGs	Standard Treatment Guidelines
UK	United Kingdom
UNRWA	United Nations Relief and Works Agency for the Refugees of Palestine
US	United States
WB	West Bank

WHO	World Health Organization
WHO-EMD	WHO Essential Drugs and Medicines policy department
WPRO	Western Pacific Region Office

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Chapter I

Introduction and background

1.1 Introduction

In 1994, the health care system within Palestinian National Authority (PNA) has undergone tremendous changes. The process of expansion of the system was very rapid. Although, the Ministry of Health (MOH) is the main authority responsible for the provision and regulation of health care in the Palestinian territory, other sectors widely provide health care services such as United Nation for Relief and Works Agency for the Refugees of Palestine (UNRWA), Non-governmental Organizations (NGOs) and private sector. UNRWA health department has been an active participant in policy-making, planning and development of the Palestinian National Health Sector. It enjoys a strong partnership with the MOH, working jointly to harmonize and standardize protocols and standards and to transfer technologies for monitoring (UNRWA, 2010).

After decades of remarkable progress in improving the health status of Palestine refugees that UNRWA serves, particularly mothers and children, challenges are paramount and overwhelming, health services of UNRWA are at the critical juncture and there are serious concerns about a possible shrinkage of UNRWA health services in light of the financial constraints facing the agency. Health services of UNRWA have yet to cope with such challenges. UNRWA provides primary health care services through 20 health care centers allocated in Gaza Strip (GS), serving 1167.361 registered refugees (UNRWA, 2010). Approximately, 15 physicians and 29 nurses are allocated for health services per 10.000 served refugees (Relief and Social Service Department "RSSD", 2010). Health centers are usually overwhelmed with a large number of patients. On average, one physician sees 100

patients per day. The time available for each consultation does not favor quality of care (UNRWA, 2010).

The introduction of the manual "How to investigate drug use in health facilities", following the collaborative work of the International Network for the Rational Use of Drugs (INRUD) and the WHO Essential Drugs and Medicines Policy Department (WHO-EDM) provided useful tools for objective and reproducible measures of the effectiveness and efficiency of drug use. These measures offer tools for auditing, supervision and monitoring for drug use practices (Tamuno, 2011).

Irrational prescriptions and use of drugs are features in health care settings of developing countries and are characterized by polypharmacy, excessive use of antibiotics, injections and use of drugs of doubtful origin, irrational drug use could also lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient and higher cost (WHO, 1994). Field tests carried out in various countries highlighted a significant degree of inappropriate prescription and use of drugs in the public sector health facilities (Enwere, et al., 2007).

To reduce the frequency of inappropriate prescription and irrational drug use, essential drug lists have been approved for the first time by WHO on 1977 and revised every two years by WHO experts committee, and by the end of 1998 about 140 countries had developed their own national lists of essential drugs, often in combination with standard treatment guidelines (WHO, 2000). Essential medicines are the drugs which satisfy health care needs of the majority of the population and they should be available within the context of functioning health system all the time in adequate amount in appropriate dosage form with assured quality and adequate information with affordable price (WHO, 2002).

To assess the scope of improvement in rational drug use in outpatient practice, WHO has

formulated a set of "core drug use indicators". It is composed of three aspects namely; (1) core prescribing indicators, (2) patient care indicators, (3) facility indicators. These indicators can be used to efficiently detect problems in drug prescribing such as polypharmacy, inclination for branded products, overuse of antibiotics or injections and prescribing out of formulary or essential drug list. Study of prescribing practices using prescribing indicators enable us to detect these problems and to implement subsequent efforts to correct them (Kumar, 2010).

The cost of irrational use of drugs consequent to irrational prescribing is enormous in terms of scarce resources, adverse clinical consequences and finance. According to the World Bank (2010), governments in developing countries expend between 20% and 50% of their national health budgets on drugs and medical supplies. Unfortunately, WHO (1993) believes that much of such expenditure is misapplied, as irrational use of drugs is prevalent especially in developing countries. The total expenditure of UNRWA (in the five fields) on drugs in 2010 was USD 18.31 million, of which 42% was spent on drugs for the treatment of diabetes and cardiovascular diseases and 14% on antibiotics (UNRWA, 2010). By rational drug use and improving prescribing patterns, much of these expenses could be saved.

To have accurate insight concerning the current status of prescribing patterns and adherence to drug use indicators at UNRWA primary health centers, the researcher was interested in carrying out this study, taking into consideration that this interest came from the fact that the researcher is working as a pharmacist in UNRWA health department and this type of research is in the core of her career tasks.

1.2 Research problem

Prescribing patterns and adherence to standard guidelines at any health facility are considered indicators of the quality of its services. UNRWA health services play a major role in the Palestinian health system as it offers primary health care services to the majority of the Palestinian refugees besides offering some secondary and tertiary services.

Rational prescribing and rational use of drugs are among the top goals that UNRWA health care system strives to achieve. Inappropriate prescribing and irrational use of drugs have a negative consequences, including, drug interaction, adverse effects and waste of resources.

Knowledge, Attitudes and Practices (KAP) influence the use of medicines in the community. Poor use of drugs, abuse of drugs; for example taking several drugs for the same illness and using the same drug under different brand names.

According to the researcher's knowledge, few studies were conducted on UNRWA health department focusing on assessing prescribing patterns of antibacterial drugs only, their results showed that the rate of prescribing antibacterial drugs increased from 53% on 1999 to 58.2% on 2004 (Shurbasi and El Rayyes, 2004). There is lack of information concerning current status of prescribing patterns, KAP of prescribers, compliance to international standards of drug use indicators and the degree of adherence to UNRWA drug formulary.

The researcher conducted this study as a trial to in-depth analyze prescribing patterns which could be the first in this regard focusing on UNRWA health centers to explore the current status of prescribing patterns and its related variables. Thus, the concern in this study is adding further illumination on prescribing patterns and practices at UNRWA.

1.3 Justification of study

Health care is a multidisciplinary service in which prescribers play a strong role of rational prescribing of drugs. Rational prescribing is associated with improved safety in drug use, better quality of life for patients and cost-effective care. Problems related to inappropriate prescribing practices of physicians in general are well recognized (Horowitz, 1999). Prescribers working in UNRWA health care are faced with a high number of patients, who are presenting, often for the first time, with a wide range of physical symptoms. The physician is under pressure to reach a diagnosis and initiate a patient management programme which almost invariably involves medication. The reasons for prescribing may be numerous. A drug may be prescribed in response to a presumed diagnosis or symptoms. Consultations often result in the prescription of multiple drugs. Increase the number of items in prescription often called polypharmacy and that increase the possibility of errors and interaction. Prescribing patterns at all levels of UNRWA health care are characterized worldwide by large variations in prescribing rates, whether by volume, polypharmacy or individual drug. Most consultations at all health delivery levels end with a drug prescription.

This study is a unique trial to have better understanding of prescribing patterns and behaviors, especially during these days as UNRWA services facing financial constraints due to reductions in donors supports as a result of the global economic regression, which made UNRWA Commissioner-General to appeal raising on 2010 (UNRWA, 2010). On the other hand, UNRWA provides free medications without any copayment scheme, which might affect prescribing patterns to large number of people, while people have to pay for medication at MOH health centers, besides the critical shortages of medication in governmental health facilities nowadays, which added extra pressure on UNRWA health

services. This condition indicates that we should pay more attention at UNRWA sector as an important health care provider sector in Gaza Strip.

1.4 Aim and objectives

1.4.1 Aim of the study

To assess prescribers' knowledge, Attitudes and Practices toward prescribing patterns at UNRWA health centers in order to promote rational prescribing which positively affects the health status of the population.

1.4.2 Objectives of the study

- To ascertain prescribing patterns and practices among UNRWA prescribers.
- To assess prescribing practices at UNRWA in reference to the WHO key drugs indicators.
- To identify variations among prescribers in relation to personal characteristics and organizational variables.
- To provide recommendations for improving prescribing practices.

1.5 Research questions

- Are drug prescribers have adequate knowledge regarding prescriptions?
- Are prescribers attitudes and practices conducive to rational prescribing?
- Is there adequate training regarding proper prescription for prescribers?
- Is there an effective monitoring system for prescriptions at UNRWA health centers?

- Is there an EDL available and feasible in each health center?
- Do prescribers adhere to international drug use indicators?
- Are there differences in prescribing patterns related to position of prescribers?
- Are there differences in prescription related to governorate and file type?
- Are drug use indicators in line with WHO standards?
- What recommendations could be inferred from this study to promote rational prescribing?

1.6 Context of the study

This study was conducted in GS UNRWA health care centers; therefore, the researcher presents some background information about the demographic, geographic context, population, Palestinian economy, health situation that have impact on the quality and the utilization of the health services.

1.6.1 Demographic context

The Gaza Strip (GS) is a narrow strip of land on the Mediterranean coast, it borders "Israel" to the east and north and Egypt to the south. It is approximately 41 km long and between 6 – 12 km wide, with a total area of 378 square km (United Nations Environment Program – UNEP, 2009). It is estimated that the number of population in Palestinian territories as around 4 million, of them 1.7 million lives in GS, most of them descendants of refugees, 41.9 % of the Palestinian population are under 15 years old (40 % in west bank and 44.9 % in the GS), while 3 % are above 65 years old (PCBS, 2010). The

population growth and the political context adds more pressure towards utilizing effective prescribing.

1.6.2 Socioeconomic context

Current political situation and the siege imposed against GS has severely damaged the Palestinian economy. According to PCBS, 23.8% of the households in the Palestinian territories in 2007 were suffering from deep poverty according to consumption patterns (13.9% in the WB, and 43.0% in the GS), while according to income patterns, 48.0% of households were suffering deep poverty (37.3% in the WB, and 69.0% in the GS), (PCBS, 2009). High population density, limited land and sea access, continuing isolation, and strict internal and external security controls have degraded economic conditions in the Gaza Strip. Israeli-imposed crossings closures, which became more restrictive after HAMAS took over the territory in June 2007, and the war on Gaza on December 2008-January 2009 "Cast Lead Operation", resulted in mass destruction of infrastructure and industry, extremely high unemployment, and high poverty rates (Gaza Strip economy profile 2012). Unemployment in the GS increased from 36% in the second quarter of 2009 to 39% in the second quarter of 2010 (World Bank, 2010). Nowadays, 80% of families in Gaza currently depend on humanitarian aid. This decline results from exceptional levels of poverty and the inability of a large majority of the population to provide basic food. As a result, humanitarian aid organizations increased food aid dramatically to meet the needs of this increasingly poor population. In 2008, more than 1 million people; about three-quarters of Gaza's population depend on food aid (Human Rights Council, 2010). These economic challenges imply that rational prescribing is a priority as it contributes in saving.

1.6.3 Palestinian health care context

Over the past years, the Palestinian health care system had been developing in dynamic way to face the instability of the Palestinian situation. The MOH, UNRWA, nongovernmental organizations (NGOs) and private, commercial organizations constitute the four main health providers of health services. The MOH runs 59 primary health care centers in the GS and 381 in the WB, the NGOs manage 194 primary health care centers; 57 in the Gaza Strip and 137 in the WB (MOH, 2010). UNRWA operates 20 primary health care centers in eight refugee camps in the GS (serving 1,167,361 registered refugees) and 41 centers in the WB (UNRWA, 2010).

In the GS, the provision of adequate health services to the population continues to be severely affected by both the Israeli blockade and Palestinian internal political divisions between the WB and the GS. While the hospitals and primary care clinics in the GS continue to function, they face multiple challenges. For example, there have been growing shortages of essential drugs and consumables at MOH health facilities: 38% of essential drugs were out of stock at central store level at the beginning of January 2011 (WHO, 2011). It is also difficult to maintain or upgrade the professional knowledge and clinical skills of health staff because the Israeli restrictions on the movement of people in and out of the GS prevent access to appropriate and up-to-date education and training. The closure of the GS is undermining the functioning of the health-care system, hampering the provision of medical supplies and the training of health staff and preventing patients with serious medical conditions receiving timely specialized treatment outside the GS (WHO, 2011).

1.6.4 UNRWA health services

UNRWA has been the main primary health care provider for Palestinian refugees for the past 60 years and is the largest humanitarian operation in the occupied Palestinian territory; it promotes a comprehensive approach to health care from preconception to old age, with a strong focus on primary health care and prevention (UNRWA, 2010).

Within its five areas of operations (Jordan, Syria, Lebanon, WB and GS), UNRWA currently runs around 137 primary health care centers and one hospital in Qalqilya in the WB, in 2010, UNRWA medical officers provided almost 10.4 million consultations totally. These were complemented by about 700.000 dental consultations and almost 260.000 dental screening sessions. By promoting continuative, comprehensive, health care from preconception to old age, focusing on primary health care and prevention, it has reached recognized results in improving the health conditions of refugees (UNRWA, 2010).

Through 20 health centers across the GS, UNRWA offers comprehensive primary care to more than 1.1 million Palestine refugees. About 86,000 people were assisted to cover hospital care costs, either in contracted secondary / tertiary care facilities or in the UNRWA hospital in Qalqilya (UNRWA, 2010). Recent reforms have brought significant improvements; bringing the antibiotic prescription rate in UNRWA health centers in line with the WHO standard, significant increase in the number of Gazans using family planning and early detection of non-communicable diseases such as hypertension and diabetes, made possible through community outreach and screenings (UNRWA, 2011).

The health programs of UNRWA are fully aware of such challenges and difficulties and are committed to address them through a health reform based on the progress made to date. In 2009, comprehensive health systems reviews were conducted in all fields. The midterm strategy of UNRWA (2011 – 2015) is the foundation of the reform, supported by the life

cycle approach. In the reform, addressing the life style illness is a key message. This will entail improvement of quality of care in crowded health centers, and outreaching to communities to bring changes in life style. Addressing health needs will also entail increasingly costly hospital payments. In order to make this feasible, fundamental improvements in the health information system through partnerships with host countries, donors and all others will remain critical. UNRWA has a strict drug policy: it strictly adheres to the WHO EDL. Most drugs are procured by international tender. In the event of shortages, drugs are bought through local tender. UNRWA provides drugs free of charge to registered refugees. UNRWA has two major drug stores: one in Jerusalem and another in the GS. Drug availability in the clinics is generally good (UNRWA, 2010).

1.7 Definition of terms

Prescription

An order for medication, therapy, or therapeutic device given by a properly authorized person, which ultimately goes to a person properly authorized to dispense or perform the order. A prescription is usually in written form; and includes the patient's name, the medication prescribed, directions to the pharmacist or other dispenser, directions to the patient that must appear on the label, prescriber's signature, and, in some instances an identifying number (Mosby's Medical Dictionary, 2009).

The researcher defines prescription operationally as the official format used for documenting the plan of care and treatment for patients at UNRWA health centers.

A prescriber

The researcher defines a prescriber as a professional, qualified individual who is licensed to treat and prescribe medications to their patients. In this study prescribers include GPs, obstetrics, pediatricians, dentists and ophthalmologists.

Essential drugs

Drugs that satisfy the health care needs of the majority of the population and must be available at all times (WHO, 1993).

The researcher defines essential drugs operationally as those drugs that needed to be available in the pharmacy all the time in enough amounts to meet patients' needs, especially for common health problems.

Essential drugs list (EDL)

EDL is a list of minimum medicine needs for a basic health care system, including the most cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment (WHO, 2010).

Formulary

A formulary is a list of drugs or medicinal products recommended for use and available for use in a given population. It needs to be owned by those required to prescribe from it, hence representatives of all prescribers need to have input into its development and it must be regularly revised to keep it up-to-date (Krska, 2009).

The researcher defines formulary operationally as a list of drugs adopted by UNRWA health department and used as a reference for prescribers.

Clinical guidelines

A clinical guideline is a series of systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances (Scottish Intercollegiate guidelines Network "SIGN" 2008).

Drug use indicators

Drug use indicators are a set of standardized indices used to measure drug use in outpatient facilities (WHO, 1993).

The researcher defines prescribing indicators as those indicators used to measure prescribers' adherence to rational prescribing. These indicators include number of drugs per prescription, percentage of encounters with antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed by generic name and percentage of drugs prescribed from EDL.

Generic name

It is the official name of the drug. Each drug has only one generic name (Ogden, 2003).

The researcher defined generic name as the official, innovative names of drugs recognized by UNRWA health department.

1.8 Lay out of the study

This study consists from five chapters: introduction, conceptual framework and literature review, methodology, results and discussion, conclusion and recommendations.

The first chapter browsed general introduction to the study, where a brief background regarding the subject of the study was provided. The researcher illustrates the problem statement, justification for conducting the study, the aim and specific objectives, research questions, definition of terms and context of the study.

The second chapter included two parts: the first part is conceptual framework where the researcher provided a schematic diagram of the conceptual framework of the study. The second part is the literature review related to the study topic and variables. In-depth detailed inquiry including related previous studies were presented to enrich the study.

The third chapter described methodology including study design, population, sample, instruments, validity and reliability of study instruments, ethical considerations, statistical analysis.

The fourth chapter presented the study results and discussion. The researcher treated the results in form of tables that make it easy for the reader to understand and make comments. The results were discussed in respect to available published previous studies that directly related to the topic of this study and its objectives.

Finally, in the fifth chapter, the researcher presented conclusion and recommendations in the light of the study results.

Chapter Two

Conceptual framework and literature review

In this chapter, the researcher presents the conceptual framework and literature review of the study themes and variables. Also, information regarding international drug indicators and previous studies were mentioned.

2.1 Conceptual framework

Conceptual framework is the map that guides the design and implementation of the study and its mechanism for illustration and summarizing the whole study variables. It was designed by the researcher based on the review of the available literature.

THE STUDY CONCEPTUAL FRAMEWORK

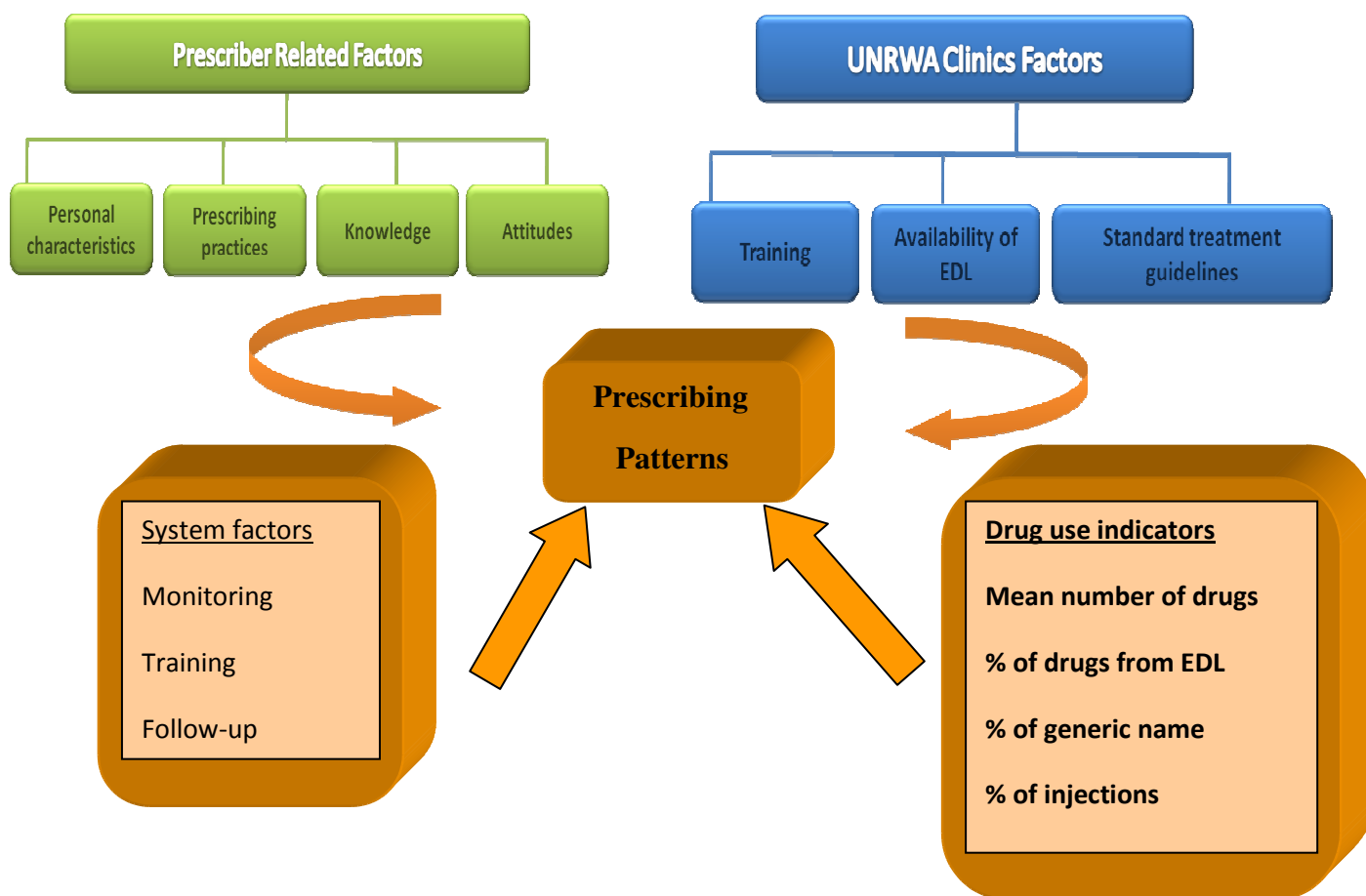


Figure (2.1): Diagram of conceptual framework

The diagram denotes that prescribing patterns and practices are influenced by prescriber related factors (personal characteristics, prescribing practices, knowledge and attitudes) and UNRWA clinics factors (training, availability of EDL and standard treatment guidelines). These factors play an important role in determining rational drug prescription and compliance to standard drug use indicators.

Prescriber related factors; including personal characteristics such as gender, position and experience, background of their study. Prescribing practices is another factor that may reflect prescribers adherence to UNRWA EDL formulary and standard treatment guidelines. Knowledge and attitudes will influence practices and behaviors in regard to prescription patterns. These factors influence prescribing from the prescribers part; having good experience, beside adequate knowledge, mostly will lead to proper prescription.

UNRWA clinics factors; including training, availability of EDL and standard treatment guidelines. Copies of updated EDL should available in hand for every prescriber to ensure rational prescribing of drugs which will be reflected positively toward improving the quality of health services offered.

Training is another factor. Training will link theory with practice and give a rational explanation to prescriptions. Regular, periodic training programs will keep prescribers updated regarding rules and regulations regarding prescribing and to be informed with any changes in the system.

These factors from the employer' part influence prescriptions. If the employer affords adequate training to employees, ensure available and clear instructions and guidelines for proper prescriptions.

System factors; including monitoring, training and follow-up. Monitoring is an approach for evaluating prescribers' performance. Developing proper monitoring system and tools

beside effective feedback will help in designing action plans to improve prescribing behaviors.

Drug use indicators; these are international standards of indicators developed by WHO and adopted by the vast majority of countries. These indicators include average number of prescribed drugs per encounter, percentage of drugs prescribed using generic name, percentage of drugs prescribed from EDL, percentage of prescribed antibiotics and percentage of prescribed injections. The degree of compliance to these indicators reflects strength in the health system and effective monitoring and follow-up of prescribers' practices.

2.2 Literature review

In recent years, variation in the medical practice of physicians has been the subject of research across many clinical fields, from the perspective of the quality of healthcare (Fukuhara, et al., 2005). Health services usually includes assessing the patients' health status, carry out some laboratory investigations and prescribing medication as a treatment to overcome the disease. Drug therapy is the most commonly used method of any disease treatment in general practice (Stanton, LA. et al. 1994, Lesar, TS. et al., 1997).

2.2.1 Historical background of drug and pharmaceutical development

Historically, traditional formulas and folk remedies were prepared by non-professionals to treat some health problems. The first known drugstore was opened by Arabian pharmacists in Baghdad in 754 (Hadzovic, 1997) and many more soon began operating throughout the medieval Islamic world and eventually medieval Europe. By the 19th century, many of the drugstores in Europe and North America had eventually developed into larger pharmaceutical companies. Most of today's major pharmaceutical companies were founded in the late 19th and early 20th centuries. In 1897, aspirin as a synthetic preparation was introduced for the first time (WHO, 2002a). Key discoveries of the 1920s and 1930s, such as insulin and penicillin, became mass-manufactured and distributed. Switzerland, Germany and Italy had particularly strong industries, with the UK, US, Belgium and the Netherlands following suit. Numerous new drugs were developed during the 1950s, mass-produced and marketed through the 1960s. These included the first oral contraceptive, cortisone, blood-pressure drugs, other heart medications and drugs for psychic problems. Cancer drugs were a feature of the 1970s. The past two decades have witnessed the introduction of new pharmaceutical products that have revolutionized

medicine. Not surprisingly, as the effectiveness of drugs therapies has grown, so too has their share of overall health system (Canadian Institute for Health Information, 2002).

Changes in the patterns of diseases and drug demand, as well as the emergence of new diseases and increasing drug resistance of potentially fatal diseases, all of these problems along with the attitudes and behaviors of governments, prescribers, dispensers, consumers and drug industry; all contributed to rising of expenditure on drugs and the growing pressure on health resources. As a result, WHO recommended that all countries formulate and implement a comprehensive National Drug Policy (NDP) to help in identifying the needs and priorities of each country (WHO, 2001a).

2.2.2 Background of drug situation in UNRWA

One of the main goals for UNRWA mission is to ensure access to essential health services. Achievement of this goal faced many obstacles in the past few years due to the unfair blockade imposed on Gaza Strip, which resulted in destruction of many aspects of life, including loss of jobs, shortage in supplies in general and medical supplies in particular and increase rates of poverty. This situation added extra pressure on UNRWA to manage the increased demand for services at UNRWA health care facilities through purchase of additional supplies and equipment.

The total expenditure of UNRWA on drugs in 2010 was USD 18.31 million, of which 42% was spent on drugs for the treatment of diabetes and cardiovascular diseases and 14% on antibiotics. Antibiotics dispensed in GS accounted for 25.7% in 2009 and 26% in 2010 (UNRWA, 2010). In May 2010, a comprehensive review of UNRWA list of drugs was conducted by Head Quarters jointly with all Fields. The aim of this exercise was to come up with a cost effective list of drugs. Fields were supposed to start purchasing their annual

requirements using this list starting from 2011 to cover their needs for 2012. A joint meeting was held between the Health Department and Procurement and Logistics Department during the period 19-21 September 2010. The objective of this meeting was to set clear strategies, establish a frame-work for the central pharmacy management, and to reach consensus among the different Fields (UNRWA, 2010).

2.2.3 Knowledge, attitudes and practice (KAP) toward prescribing

According to the World Bank, governments in developing countries expend between 20% and 50% of their national health budgets on drugs and medical sundries (World Bank, 2007). Unfortunately, the WHO believes that much of such expenditure is misapplied, as irrational use of drugs is prevalent especially in developing countries. Hence, governments, health workers and the community are concerned with the availability, handling, effectiveness and safe use of drugs (Adebayo and Hussain, 2010).

In this regard, adequate knowledge and attitudes beside proper practices play a major role in improving prescriptions and rational drug prescribing. KAP studies explore respondents' knowledge, attitudes and practices toward a particular topic. They are typically used for documenting characteristics, knowledge, attitudes and practices that may serve to explain health risks and behaviors. KAP studies are very helpful for identifying knowledge gaps, cultural beliefs and behavioral patterns that may facilitate efforts to improve health services. In addition, data collected from KAP studies enable program managers to set priorities, to establish baseline levels and to measure changes from interventions (Launiala, 2009). The study conducted by Chukwuani (2002) revealed that appreciable gaps in knowledge with respect to rational drug use, still exists among healthcare professionals and recommended that there should be an intervention program involving continuing education

to influence the KAP of healthcare providers and the establishment of standard treatment guidelines. Another study concluded that imparting the knowledge and awareness of pharmacovigilance among health care professionals by means of continues educational intervention would bring update knowledge of practice for drug safety into their every day clinical practice (Rajesh, et al., 2011).

2.2.4 Prescribing patterns

A prescription conveys a message from the prescriber to the patient (Kumari, et al. 2008). The study of prescribing pattern is a component of medical audit which seeks monitoring, evaluation and necessary modifications in the prescribing practices of the prescribers to achieve rational and cost-effective medical care. Thus the monitoring of prescription and drug utilization studies can identify the problems and provide feedback to the prescribers so as to create awareness about irrational use of drugs (Reddy, et al., 2011).

Over the past few decades, drug expenditure has risen rapidly in most of the countries and this has been a reason for concerned policymakers to take measures to guarantee the sustainability of health care system. There is also concern regarding irrational, inappropriate, or sometimes even harmful prescribing (Carthy, et al., 2000). In this regard, some international organizations like WHO and INRUD have come forward for medicine utilization study to quantify the present state, the developmental trends and to formulate the policies for intervention (Halдар, et al., 2011).

2.2.5 Rational prescribing

countries need to address. Health services in Palestine are provided through four main actors: (a) the MOH, providing primary and secondary care, with 56% of the population

being covered by a public health insurance; (b) the NGOs, providing primary, secondary and tertiary health care at low costs for all the population; (c) UNRWA, providing primary health care, free-of-charge, to Palestinian refugees; and (d) the private sector, accessible to the better-off classes of the population (Khatib, et al., 2008).

Drugs are expensive, constitute a large percentage of the costs of the health care and therefore require optimal or rational use. Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and a reasonable cost (Minocha, et al., 2000). Rational prescribing forms the corner stone of successful implementation of the rational use of drugs (Vijayakumar, 2011).

The rational use of drugs requires that patients receives medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for adequate period of time and at the lowest cost to them and to the community (WHO, 1988).

2.2.6 Irrational prescribing

Medically, inappropriate and economically inefficient use of drugs is widely encountered in many countries both in health facilities and in the communities, jeopardizing the quality of care and draining the limited resources for health. The existence of this public health problem and the need for action has been acknowledged worldwide (WHO/WPRO, 2002). Prescription writing requires updated knowledge and skill. It reflects the clinical judgment and behavior of the physicians. Irrational prescribing trends lead to unproductive and risky treatment; such a prescription manifests in either exacerbation/prolongation of illness or higher costs or both. Physicians often face challenges in selecting, initiating, and individualizing appropriate drug therapy for patients. Irrational prescriptions and use of drugs is a feature in health care settings of developing countries and is characterized by

polypharmacy, excessive use of antibiotics and injections and use of drugs of doubtful origin. Irrational drug use could also lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs (WHO, 1994). Inappropriate drug prescribing is a global problem. Field tests carried out in various countries highlighted a significant degree of inappropriate prescription and use of drugs in public health facilities (Enwere, et al., 2007). Numerous studies, both from developed and developing countries, describe a pattern that includes polypharmacy, the use of drugs that are not related to the diagnosis, or unnecessarily expensive, the inappropriate use of antibiotics, and irrational self-medication, with drugs frequently taken in underdose (Hogerzeil, 1995). In most instances, drugs does no apparent harm to the patient, but sometimes the results are tragic. Overuse of medicine is an undesirable behavioral pattern.

In order to facilitate the proper use of drugs, WHO in 1975 discussed about drug policy which was followed by the selection of 250 drugs (Rahman, 2010). The cost of irrational use of drugs is enormous in terms of both scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits (Shankar, PR. 2002) and it has been estimated that 50% or more medicine expenditure is being wasted through irrational prescribing, dispensing and patient use of medicine (Euro Health Group and WHO Collaboration, 1997).

There are many factors underlying irrational use of drugs, including; patients, prescribers, drug supply, drug regulation and drug industry. DeVries, et al. (1994) emphasized that lack of education and training regarding good prescribing practices, pressure from the patients to prescribe specific drugs and lack of up-to-date information regarding drugs could be reasons for irrational prescribing. The choice of an individual drug for a particular patient is one of the most important clinical decisions in office-based medical practice. Perhaps more than any other clinical judgment, the physician's prescribing decision is the

result of input from the patient, commercial sources, professional colleagues, the academic literature, and government regulators (Soumerai, et al., 2005).

2.2.7 Prescribing indicators

Drug use evaluation is a system of ongoing, systematic, criteria-based drug evaluation that ensures the appropriate use of drugs. Drug use is complex subject involving the physician, the patient and the dispenser; each of these is influenced by many factors that are often difficult to measure and quantify (WHO, 1995). Indicators are useful quality improvement tools as they identify processes, events, complications and outcomes that provide an insight into the quality of care. Examining indicator results can direct clinicians to likely areas for quality improvement. Re-measure, over time, can assess the effectiveness of quality activities and provide a framework for comparison and assessment of good practice in the quality use of medicine.

In 1975, the Twentieth World Health Assembly, in resolution WHA 28.66, stated the need for WHO to develop means by which it can help Member States to formulate national medicines policies. It should also assist countries to implement strategies such as selection of essential drugs, appropriate procurement of quality drugs based on health needs and should provide education and training in various elements of pharmaceutical programs (WHO, 2006).

To assess the scope of improvement in drug use in outpatient practice, WHO has formulated a set of Core Drug Use Indicators (CDUIs) composed of three parts; *the core prescribing indicators, the patient care indicators and facility indicators* (Karande, et al., 2005). They provide a measure of the optimal use of these resources and can help in correcting deviations from expected standards and in planning (Odunsanya, 2004). The

introduction of the CDUIs following the collaborative work by the members of the International Network for Rational use of drugs (INRUD) and the Drug Action Program – WHO (DAP-WHO) regarded as one of the most noticeable achievements in the orchestrated efforts at promoting rational use of drugs. These indicators are highly standardized, do not need national adaptation and provide a simple tool for quickly and reliably assessing a few critical aspects of drug use in primary health care setup. These indicators includes:

Core prescribing indicators includes; average number of drugs per encounter (1.6 – 1.8), percentage of encounters with antibiotic prescribed (20%-26.8%), percentage of encounters with an injection prescribed (13.4%-24.1%), percentage of drugs prescribed by generic name (100%) and percentage of drugs prescribed from EDL (100%) (WHO/ICIUM, 1997).

Patient care indicators includes; average consultation time, average dispensing time, percentage of drugs actually dispensed, percentage of drugs adequately labeled and patients' knowledge of correct doses

Facility indicators includes; availability of essential drug list / formulary and availability of key drugs (WHO, 1993).

2.2.7.1 Essential drugs list (EDL)

Essential drugs offer a cost-effective solution to many health problems in developing countries. They should be selected with regard to disease prevalence, be affordable, with assured quality and be available in the appropriate dosage forms; prescribers can treat patients in a rational way if they have access to EDL and essential drugs are available on a

regular basis (Karande, et al., 2005). The international conference sponsored by WHO/UNICEF on primary health care at Alma-Ata 1978 provided a guiding framework for public health initiatives. Its declaration included appropriate treatment of common diseases and the provision of essential drugs as two vital components of primary health care concept (Guyon, et al., 1994). In 1979, WHO had another step related to the essential drugs which was the establishment of the WHO Action Program on essential drugs. A very remarkable stage toward the improvement of the pharmaceutical situation in countries took place in 1985 in Nairobi which was the conference of experts on rational use of drugs (Fattouh, 2005). Essential drugs are defined as "drugs that satisfy the health care needs of the majority of the population and must be available at all times (WHO, 1993).

Essential medicines are the drugs which satisfy health care need of majority of population and they should be available within the context of functioning health system at all time in adequate amount in appropriate dosage form with assured quality and adequate information with affordable price. The WHO essential core list presents a list of minimum medicine needs for a basic health care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment. The WHO essential complementary list presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed. In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings. WHO essential drug list helps in promotion of rational drug therapy (Shah, et al., 2010).

The Palestinian MOH implemented the first EDL and EDL-Formulary in 2000 and 2002, respectively. Procurement processes are now tied to the EDL and all health workers at the

MOH have received appropriate training. In the NGOs, strong efforts were made to rationalize the use of medications and each NGO has its own EDL (Khatib, R et al., 2008).

2.2.7.2 Generic prescribing

A generic drug is a pharmaceutical product, usually intended to be interchangeable with the innovator product, which is usually manufactured without a license from the innovator company and marketed after the expiry of patent or other exclusivity rights. It is advised to use generic name for drug prescription because it ensures procurement of quality medicines at the lowest possible process and ensures the use of common language among health professionals who have been trained in different countries and thus are used to different brand names (WHO, 1997a). Currently, prescribers and consumers are flooded with a vast array of pharmaceutical preparations with innumerable trade names available (Mirza, et al., (2009). It is of great importance to know that generic products offer therapeutic efficacy equal to their branded equivalents at much lower costs. Development and dissemination of generic drug program for prescribers would change their prescribing behavior toward generic drugs.

2.2.8 Strategies to promote rational prescribing

The various interventions to promote rational prescribing are best classified as educational, managerial and regulatory. Before implementing these interventions, proper assessment and investigations must be carried out to measure the scope of irrational prescribing. To achieve the goal of promoting rational prescribing, there is a need to develop clinical guidelines and essential drug lists and formulary. Availability of these drugs is the key for

achieving this goal. The various interventions to promote rational prescribing are best defined as educational, managerial and regulatory (Hogerzeil, 1995).

2.2.8.1 Educational interventions

Rational use depends on the knowledge, attitudes and practices of health care practitioners and consumers. Educational strategies for both groups are essential but frequently neglected or inappropriate. In the case of health care practitioners there is often a focus on the transfer of narrow, time-limited pharmacological knowledge, rather than on the development of lifetime prescribing skills and the ability to assess drug information critically (WHO, 2001).

Educational interventions attempt to inform health care practitioners, especially prescribers, dispensers or patients to use drugs in the proper way. Educational strategies include printed materials, seminars, bulletins and face-to-face interventions. It is suggested that printed materials alone are ineffective, it is likely that this also applies to essential drugs lists and treatment guidelines if these are just distributed to prescribers without an introduction campaign and without intensive follow-up, and especially if the prescribers had not been involved in the development process (Hogerzeil, 1995).

A review of 59 published evaluations of the effect of clinical guidelines concluded that all but four of these studies detected significant improvements in the process of care after the introduction of guidelines, and all but two of the 11 studies that assessed the outcome of care, reported significant improvements. However, the size of the improvements in performance varied considerably (Grimshaw, 1993). Essential drugs lists together with an educational program and follow-up are probably effective as well.

In this regard, several studies have critically reviewed the available evidence to identify the most effective interventions and the following conclusions may be drawn; an important observation is that printed materials alone hardly influence prescriber behavior and that any such influence is usually of short duration (Soumerai, 1990). Most of these interventions assume that the main reason for incorrect prescribing is lack of knowledge and that if prescribers had the correct information, their prescribing would automatically improve. This is not always the case in view of the many other factors influencing prescribing, like drug promotion (Lexchin, 1989). Another aspect of the problem is that prescribers with irrational prescribing behavior are the very ones that are less likely to read the educational material mailed to them. Proven cost-effective interventions are face-to-face education focused on a particular prescribing problem in selected individuals (McGavock, 1989), structured Prescription forms and focused educational campaigns together with widely discussed and frequently revised treatment guidelines could decrease prescribing problems.

A general problem is that many interventions have only been tested in developed countries and that the results can therefore not automatically be extrapolated to developing countries where conditions are so different. In the absence of well conducted studies, Laing (1990) has attempted to give provisional advice to developing countries with regard to possible effective interventions. He suggested that basic and post- basic medical education should include specific training in rational prescribing; that essential drugs lists and therapeutic guidelines should be developed through wide consultation and feed-back and be disseminated by means of intensive educational programs. Face-to-face education may be effective but expensive; and printed materials, including treatment guidelines, are ineffective without educational programs and follow-up activities. Interactive group discussion also is an effective intervention; a study conducted in Indonesia on 1996

revealed significant decrease in prescribing injections from 69.5% to 42.3% among intervention group compared to a reduction from 75.6% to 67.1% among the control group, this result concluded that interactive group discussion significantly reduced the overuse of injections and had long term impact as well as injections were not substituted for other drugs (Fattouh, 2005).

2.2.8.2 Managerial interventions

Managerial strategies are also important in promoting rational use and in discouraging waste. The most important strategies are discussed below. In all cases, a careful analysis of the underlying problem, extensive discussions with all staff involved, a careful introduction, and intensive supervision and follow-up help to ensure maximum impact of the strategies. In some cases, unexpected negative effects may be the result (WHO, 2001). Managerial methods refer to various restrictions on prescribing, e.g. restrictive lists, a maximum number of drugs per prescription, budgetary or cost restrictions, endorsement by higher qualified consultants, patient co-payment strategies, price measures, structured prescription forms or a maximum duration for inpatient prescriptions (Hogerzeil, 1995). Restrictive lists can be achieved through developing and adopting EDL, standard treatment guidelines (STGs) or drug formularies. EDLs provide the prescribers with a list of the drugs which are the most effective and economic in treating the most common health problems. To achieve success in this regard, adequate monitoring and follow up is a very important and ongoing process. A study conducted in Uganda showed that implementing STGs followed by training and monitoring was very effective in reducing the average number of prescribed drugs (Kafuko, et al., 1999).

2.2.8.3 Regulatory interventions

Regulatory measures include procedures to critically evaluate drugs and product information (e.g. data sheet, patient information leaflet) before market approval is granted, scheduling drugs for different sales levels (over the counter, pharmacy only, prescription only) and specifying for each drug a minimum level of prescriber or health facility (Hogerzeil, 1995).

To improve prescribing practices, the research believes that a combination of different interventions should be implemented including; educational sessions, provision of drug formulary, and strict follow-up.

2.2.9 Compliance with standards of prescribing

Appropriate prescribing is a major challenge for health services. The consequence of inappropriate prescribing are major, both concerning clinical and cost implications. Adherence to standard guidelines of drug prescription varied from one country to another. These variations could be related to physicians' academic background, health system, availability of drugs, economic situation, etc....To determine the degree of compliance to standards of drug prescription, the researcher will analyze previous studies that have been conducted locally, regionally and internationally.

2.2.9.1 Regional and international studies

Al-Kot, et al. (2011) conducted a study in Egypt showed that the average number of drugs prescribed per encounter was 2.4, percentage of drugs from EDL was 94.7%, percentage of drugs prescribed by generic name was 89.6%, prescription errors were detected in 21.3% of prescriptions, percentage of prescribed injections was 12.5% and percentage of

prescriptions with antibiotic was 36.6%. Bashrahil (2010) conducted a study in Yemen showed that the average number of drugs prescribed per prescription was 2.8, percentage of drugs prescribed by generic name was 39.2%, percentage of prescriptions with antibiotics was 66.2%, percentage of prescribed injections was 46%, EDL was available in 78.9% of facilities and the percentage of drugs from EDL was 81.2%. Simon, et al. (1998) conducted a study in Morocco showed that the average number of drugs prescribed was 3.27 per prescription and the percentage of drugs prescribed from EDL ranged between 29.8% - 82.4%. Hasan, et al. (1997) conducted a study in United Arab Emirates showed that the average number of drugs prescribed was 2.7 per prescription, the percentage of drugs prescribed from EDL was 100% and the percentage of drugs prescribed by generic name was 100%. The study conducted in Saudi Arabia by Bawazir (1993) showed that the average number of drugs prescribed per encounter was 2.1, percentage of prescribed antibiotics was 15.4%,

Babalola (2011) conducted a study in Nigeria revealed that the average number of drugs per encounter was 6.11, percentage of drugs prescribed by generic name was 69.81%, percentage of prescriptions with antibiotics was 50.1%, percentage of injections was 72.7%, percentage of drugs from EDL was 94%. Jun Zou, et al., (2011) study carried out in China indicated that the average number of drugs per prescription was 2.04, percentage of drugs prescribed by generic name was 69.2%, percentage of prescriptions with antibiotics was 39.15% and percentage of prescribed injections was 22.63%. Haldar, et al., (2011) conducted a study in India showed that the average number of drugs per prescription was 3.7, percentage of drugs prescribed by generic name was 18%, percentage of drugs from EDL was 81%. Tamuno (2011) study showed that average number of drugs per encounter was 3.2, percentage of drugs prescribed by generic name was 55.4%, percentage of prescriptions with antibiotics was 43.8%, percentage of drugs from EDL was 91.2% and

percentage of prescriptions with injections was 18%. Eze, and Olowu (2011) conducted a study in Nigeria showed that the average number of drugs per prescription was 3.9, the percentage of drugs prescribed by generic name was 48.9%, percentage of encounters with antibiotics was 23%, percentage of prescribed injections was 0.8% and percentage of drugs from EDL was 95.4%. Vijayakumar, et al., (2011) study results indicated that average number of drugs per prescription was 3.01, percentage of drugs prescribed by generic name was 27.3%, percentage of prescriptions with antibiotics was 9.6% and 41.6% of prescribed drugs were not from the EDL. Kumar, et al., (2010) results showed that the average number of drugs per encounter was 2.81, percentage of drugs prescribed by generic name was 20.31%, percentage of drugs from EDL was 49.63%, percentage of encounters with antibiotics were 43.95% and percentage of encounters with injection was 2.36%. Mirza, et al., (2009) carried out a study in Bangladesh showed that the average number of drugs per prescription was 3.72, the percentage of drugs prescribed by generic name was 30.7%, percentage of drugs prescribed from EDL was 77.61%.

In India Kumari (2008) study results showed that the average number of drugs per prescription was 3.1, the percentage of drugs prescribed by generic name was 27.1% and percentage of prescriptions with antibiotics prescribed was 20.6%, the study conducted by Bharti et al., (2008) showed that average number of drugs per prescription was 2.8, percentage of drugs prescribed by generic name was 48.5%, percentage of prescriptions with antibiotics was 60.9%, percentage of prescribed injections was 13.6% and percentage of drugs from EDL was 66.9%, the results obtained by Karande et al., (2005) showed that average number of drugs per prescription was 2.9, percentage of drugs prescribed by generic name was 73.4%, percentage of prescriptions with antibiotics was 39.6% and the percentage of drugs from EDL was 90.3% and the results obtained by Sharma and Kapoor (2003) showed that average number of drugs per prescription was 2.53, percentage of

drugs prescribed by generic name was 5.13% and use of drug was inappropriate in 33% of the prescriptions.

Shankar, et al., (2006) conducted a study in Nepal showed that the mean drugs prescribed per prescription was 2.15, percentage of drugs prescribed by generic name was 32.6% and the percentage of drugs prescribed from EDL was 52.69.5%, while the study conducted in Iran by Moghadamnia, et al., (2002) showed that the mean number of drugs prescribed per encounter was 4.4, the percentage of drugs prescribed by generic name was 98%, percentage of prescribed antibiotics was 61.9% and injections were prescribed in 58% of encounters and the study of Siddiqi, et al., (2002) showed that the mean number of drugs per prescription was 4.1 for private and 2.7 for public sector GPs, percentage of prescribed antibiotics was 62% in private and 54% in public sector, percentage of prescribed injections was 48% in private and 22% in public sector, while the results obtained by Guyon (1994) showed that the average number of drugs per prescription was 1.44, percentage of prescriptions with antibiotics was 25%, percentage of drugs prescribed by generic name was 78%, EDL was available only in 16% of health facilities and 85% of prescribed drugs complied with EDL.

Analysis of regional and international studies revealed the following:

Concerning average number of drugs prescribed per encounter, all the studies revealed that it was higher than WHO standards (1.6 – 1.8). Average number of prescribed drugs ranged between 2.04 – 4.4 drugs per encounter.

Concerning percentage of drugs prescribed by generic name, all the studies revealed that it was lower than WHO standards (100%). The lowest value was 5.13% (Sharma, 2003) and only one study was almost near the standard value as shown from the results of Moghadamnia (2002) where the percentage of drugs prescribed by generic name was 98%.

Concerning percentage of drugs prescribed from EDL, all the studies revealed that it was very low compared to the WHO standards (100%). Few studies showed results higher than 90%.

Concerning percentage of prescribed antibiotics, most of the studies revealed high rate of prescribing antibiotics compared to WHO standards (20 – 26.8%). Few studies were in the normal range (Eze 2011; Kumari 2008; Guyon 1994).

Concerning percentage of prescribed injections, most of the studies revealed high rate of prescribing injections compared to WHO standards (13.4 – 24.1%). Few studies were within normal range (Jun Zou 2011; Tamuno 2011; Bharti 2008).

From the above analysis, it was clear that there was a real problem in prescribing worldwide despite of the advances in health care services and the pool of research studies that examined prescription patterns. Further activities should concentrate on strategic interventions to follow the standards of ideal values among prescribers in primary health care facilities. Interventions should have two aspects; educational and managerial, in addition to that, close monitoring, evaluation and feedback is the core stone for achieving this goal.

2.2.9.2 Palestinian studies

Khatib, et al., (2008) study results showed that average number of drugs prescribed was 1.9 drugs per encounter, percentage of prescribed antibiotics was 59%, percentage of injections was 16% per encounter, percentage of drugs prescribed by generic name was 24% and only 45% of clinics have EDL available.

These results revealed that the average number of prescribed drugs and injections were in accordance with WHO standards, while prescribed antibiotics were high and availability of EDL and using generic name was low compared to WHO standards.

On the other hand, Saleh (2008) showed that 71% of physicians used UNRWA formulary in prescribing, percentage of prescriptions with antibiotics was 55.4% and 99.7% of prescribed antibiotics were from UNRWA EDL, the percentage of encounters receiving injections was 2.2%, percentage of drugs prescribed by generic name was 4.5% and the average number of drugs prescribed per encounter was 2.0.

These results indicated that adherence to essential drugs list available at UNRWA was high and almost similar to WHO standards (100%), also, the average number of prescribed drugs per encounter was similar to WHO standards (< 2.0). On the other hand, prescribing of antibiotics was high compared to WHO standards ($\leq 25\%$), percentage of drugs prescribed by generic name was very low compared to WHO values (100%) and percentage of prescribed injections was low compared to WHO standards (13.4 – 24.5%).

Another study carried out by Fattouh (2005) showed that 67.4% of study participants used the EDL, the average number of prescribed drugs was 1.92 per prescription, percentage of drugs prescribed from the EDL was 97.85%, percentage of drugs prescribed by generic name was 5.47%, the availability of a copy of Palestinian National Formulary (PNF) in the surveyed clinics was 28.3% and the availability of key drugs was 82.6%.

These results revealed the average number of prescribed drugs per prescription was in accordance with WHO standards (< 2.0), while adherence to other indicators was low, including use of EDL, percentage of drugs prescribed from EDL and percentage of drugs prescribed by generic name. These results indicated that prescribers working at governmental PHC have low adherence to international standards of prescribing and further investigations and follow-up is needed.

Shurbasi and El Rayyes (2004) results showed that the percentage of prescribed antibiotics was 58.2%. Analyzing appropriateness of prescriptions, the results showed that 94.8% of

prescriptions have diagnosis documented properly, appropriateness of indications for prescribing antibacterial drugs was 90.8%, the overall rate of appropriateness of the selection of antibacterial drugs was 90.4%, appropriate dose was prescribed to 75.1% of patients and the appropriate duration of treatment was prescribed to 80.5% of patients.

These results revealed that the percentage of prescribed antibiotics was high compared to WHO standards, while the other indicators were lower than ideal values.

Analysis of the results obtained from Palestinian studies revealed that the average number of prescribed drugs per encounter in all the studies was in accordance with WHO standard values, percentage of drugs prescribed from EDL was high but did not reach the ideal value of (100%), percentage of drugs prescribed by generic name was too low and percentage of prescribed antibiotics was high. These results raise the need for interventional strategies to improve prescribing patterns in Palestinian primary health care centers for the safety of patients and proper use of available resources.

Chapter Three

Methodology

In this chapter, the researcher presented main issues related to research methodology as study design, population, place of study, size of sample and sampling method. Construction of questionnaire, piloting and ethical considerations also explained in the context of this chapter.

3.1 Study design

The researcher used cross-sectional design to describe the present status of prescribing patterns at UNRWA health care centers. Cross-sectional studies are generally carried out at a point of time or over a short period and are usually quick and cheap compared to other study designs (Polit, 2004). In line with WHO, sample of prescriptions were retrospectively reviewed.

3.2 Study population

The study population consisted of two parts:

- All prescribers working at UNRWA health centers, their total number is 157 prescribers.
- All patients' files (prescriptions) registered in these health centers.

3.3 Study participants

All the 157 physicians were asked to participate in the study, only 121 prescribers agreed to participate (85 males and 36 females), with response rate of 77.07%.

Also 1621 files were selected randomly from the UNRWA health centers in GS (664 males and 957 females) covered the period between May to October 2011. The researcher

followed the WHO recommendations on the sample size for the WHO; the minimum sample size recommended for a basic cross sectional study consist of 20 health centers and 30 patient encounters per facility is taken (WHO,1993).

Table (3.1): Distribution of study sample according to place

Governorate	No. of prescribers	No. of prescriptions
North	14	174
Gaza	34	423
Middle	28	427
Khanyounis	20	218
Rafah	25	379
Total	121	1621

All the prescribers who were working at UNRWA health centers during data collection were included in the study. Regarding the prescriptions, a retrospective, multistage sample of patients' encounters was drawn. According to WHO standards for this kind of study, 20 health center should be included in the study and at least 30 prescriptions should be chosen from each health center (WHO, 1993). Sampling process included the following steps:

- Prescriptions were chosen for the six months proceeded the study (from May – October 2011) as recommended by WHO. The retrospective data must be twelve-month period prior the survey date, and if medical record data are too difficult or time consuming to extract ,the list should cover as much of the study period as possible (WHO,1993). Because of the study is conducted in all Gaza Governorates UNRWA heath centers, time was limited, so the interval of 6 months was sufficient and subsequently used.

- Prescriptions from each month in each clinic were chosen in three stages: from the first 10 days of the month – from ^{11th} - ^{20th} of the month – and the last 10 days of the month. Prescriptions were stratified to include child files, general files, chronic files and mother files according to the recording system in UNRWA health centers.
- Prescriptions were divided into four groups, child files, general family files, chronic files and mother files.
- For each month and each group, three prescriptions were randomly drawn ,one from the first 10 days of the month, one from the middle days and one from the last 10 days randomly.

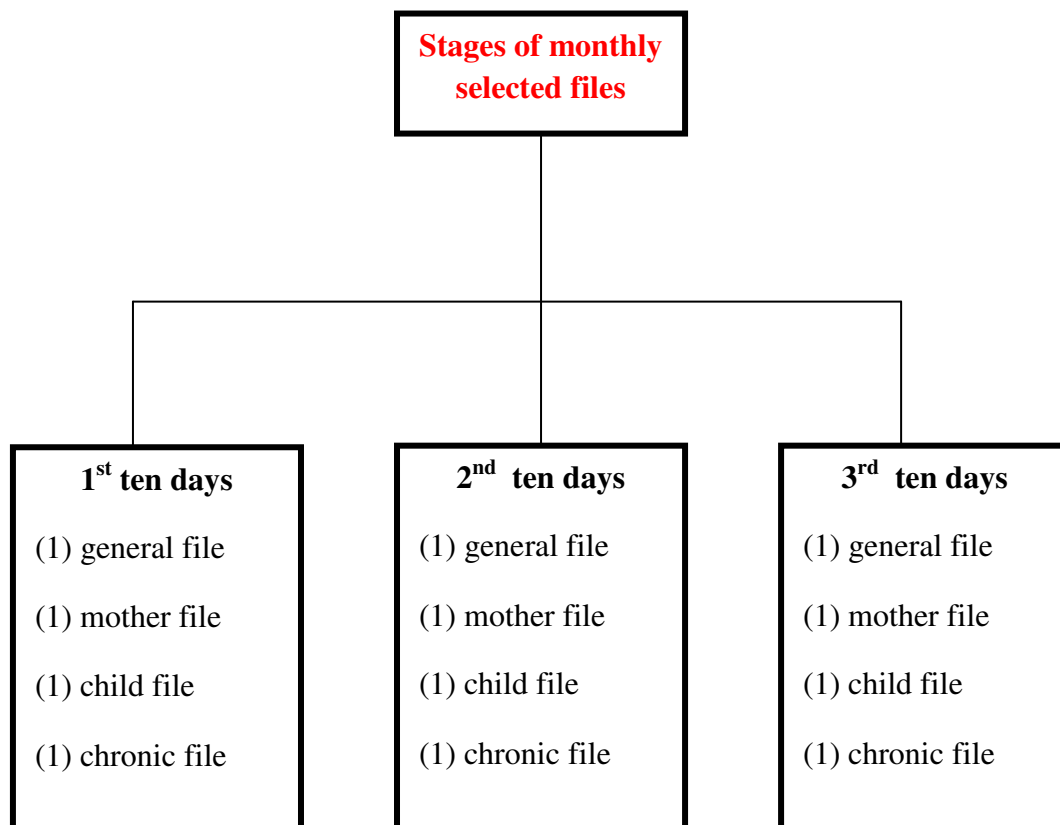


Figure (3.1): Stages of files selection

Table (3.2): Distribution of prescriptions according to onset

Onset	No. of prescriptions	Percent
First 10 days of the month	589	36.3
11 th – 20 th day	445	27.5
Last 10 days of the month	587	36.2
Total	1621	100.0

Table (3.3): Distribution of prescriptions according to file type

Type of file	No. of prescriptions	Percent
Child file	452	27.9
General file	528	32.6
Mother file	308	19.0
Chronic file	333	20.5
Total	1621	100.0

3.4 Eligibility criteria

3.4.1 Inclusion criteria

- All prescribers who were employed in UNRWA health centers during the period of data collection.
- All the official written prescriptions (available in client files), date between May – October 2011.

3.4.2 Exclusion criteria

- Prescribers who were in long term vacation during period of data collection.
- Prescribers work on job creation program.
- Unofficial prescriptions.

- Prescriptions written beyond the time frame of this study.

3.5 Setting of the study

This study was conducted in all UNRWA primary health centers in Gaza Strip (20 health centers).

3.6 Period of the study

The research started in the year 2011 first with introduction , literature and conceptual frame work in June 2011. After approval of the proposal by the School of Public Health Al-Quds University, an ethical letter was sent to Helsinki committee. Self administered constructed questionnaire and prescribing encounters checklist were completed on December 2011 after a pilot study. A permission from the Chief Field Health Program of UNRWA (CFHP) was obtained. Data collection started on October 2011 and completed on December 2011.

3.7 Instrument of the study

Two instruments were used in this study to increase reliability of the study.

- Self-administrated questionnaire was designed in English language to accomplish the objectives of this study of investigating the KAP regarding prescribing patterns and behaviors practiced by physicians.
- Checklist to examine drug use indicators adopted from WHO standards.

3.7.1 Questionnaire Design

The researcher developed the questionnaire based on available literature, field observation and consultation with experts in the field. The questionnaire was constructed as close ended questions and was divided into four parts.

- The first part included general information;
- The second part included prescribing patterns;
- The third part included knowledge and attitudes about prescriptions;
- The fourth part included prescribers' practice. (Annex No. 1)

3.7.2 Checklist design

The researcher selected WHO drug use indicators were used according to the study objectives including (1) average number of drugs prescribed in the prescription, (2) percentage of drugs prescribed from essential drug list (drug formulary), (3) availability of copy of EDL at health facility, (4) percentage of analgesic drugs, (5) percentage of injection drugs prescribed, (6) documentation of diagnosis in the prescription.

WHO drug use indicators checklist were adapted to facilitate data collection according to the recording system in the health centers. Checklist containing the following information: date of prescription, file number, gender, number of drugs, EDL, generic name, antibiotics, analgesics / NSAIDs, injection, diagnosis. (Annex No. 2)

3.8 Reliability and validity of questionnaire

Content validity

Prescribing encounters checklist is adopted from WHO guidelines (WHO, 1993) so it is valid as its internationally approved. The self administered questionnaire was validated by team of reference (8 experts of different specialties), their comment and evaluation was taken in consideration and the questionnaire also was submitted to WHO for validation and the evaluation was taken into consideration.

Reliability

To improve reliability the researcher increase the number of measurement (two instruments) and the items selected are relevant to the topic of the measurement. To ensure reliability of study instruments, standardization of questionnaire implementation as well as drug use indicators was guaranteed. Also, the same instructions and process were followed during data collection.

3.9 Ethical and managerial consideration

- Required permissions and approvals were obtained before conducting the study including; School of Public Health Al-Quds University., Helsinki committee (Annex 4), and health department at UNRWA (Annex 5). To carry out the study. Every participant received a complete explanation about the purpose of the study, instructions and the duration to complete the questionnaire.
- Confidentiality was maintained at all times during the study.

3.10 Pilot Study

Prior to the process of actual data collection a pilot study was conducted ,as pretest for the data collection instruments in order to predict the appropriateness of the instruments and to detect if there is a need for any modifications to be done for the instruments. Examine reliability and validity of the research instruments, and to have experience with the subjects, setting methods of measurements. The researcher conducted a pilot study in two clinics. The pilot subjects of prescribers and prescriptions were included in the study.

3.11 Data collection

The researcher distributed the questionnaires to all prescribers working in UNRWA health centers, the questionnaire was self administered as the target population were highly professional and to encourage giving real credible answers about his/her KAP and feelings. To ensure proper and accurate data gathering, needed explanations were given prior to filling the questionnaires. The collected questionnaires were checked for completeness and logical filling and then coding prior to input onto the computer as detailed later. Regarding the checklist, data collection with regard to WHO indicators checklists for the selected indicators, the researcher gathered data from the patients' files, including general files, mother files, children files and chronic files. Data was collected three times per month (first ten days, second ten days and the third ten days). Data was transferred from patients' files to the checklists. A total of 1621 checklists were collected.

3.12 Response rate

The study population consisted of 157 prescribers from the five governorates, of them 121 (77.07%) agreed to participate in the study.

3.13 Data entry and analysis

- Questionnaires and checklist were reviewed.
- Data entry was performed after over viewing of the returned questionnaires and drug use indicators checklist. Total accepted questionnaires were 121 and total accepted drug use indicators checklists were 1621.
- The next step was designing a data entry model using SPSS program version 13.
- The questionnaires and drug use indicators checklists were coded and entered into the computer by assistance of a statistician.
- Data cleaning was performed to ensure that data were entered correctly. This process was achieved via checking out a random number of questionnaires and checklists and performing descriptive statistics for all the variables.

Data analysis was performed by assistance of a statistician and under supervision of the supervisor as follows:

- Frequencies, means and standard deviation analysis was computed for the study variables.
- Cross-tabulation of specific variables was performed.

- The selected drug use indicators were computed and interpreted in line with WHO standards.
- To examine relationship and differences between study variables, One way ANOVA test and Chi square were performed.

3.14 Limitations of the Study

The study was limited to the following;

- Place and time: the study took place in UNRWA primary health centers only and restricted for prescriptions commenced from May – October 2011.
- The researcher faced some obstacles during preparation of this study including frequent cutoff of electricity and movements between health centers all over Gaza Governorates.
- The type of the study (cross sectional), where the researcher have to visit all UNRWA health centers in GS (20 centers). Each center was visited at three times interval during the month for data collection (during the first ten days of the month, during the second ten days and during the third ten days). This process took great efforts and time from the researcher.

Chapter Four

Study results and discussion

This chapter presents the findings of statistical analysis of data. Descriptive analysis of demographic characteristics of study participants is illustrated. In addition, inferential results of study variables are illustrated, moreover; relationships between selected variables are explored using proper analytical statistical tests. The results are illustrated below.

4.1 Sample characteristics

The participants of this study consisted of 121 physicians (prescribers) working at UNRWA health care centers in Gaza provinces, of them; 71.4% were males and 28.6% females, 26.1% of them aged 30 years and less, 44.5% aged between 31 – 40 years, 12.6% aged between 41 – 50 years and 16.8% aged more than 50 years. Around two third (64.5%) were GPs, 26.4% were specialists and 9.1% were holding managerial posts. Regarding specialty, 12.5% were obstetricians, 43.8% were pediatricians, 34.4% were dentists, 3.1% were in other specialties and 6.3% were ophthalmologists. Regarding place of graduation, 41.5% graduated from Arab countries, 43.2% graduated from non-Arab countries and only 15.3% graduated from Palestine. Regarding years of experience, 30.3% have had experience of five years and less, 31.1% their experience ranged between 6 – 10 years, 19.3% have had experience which ranged between 11 – 20 years and 19.3% their experience was more than 20 years.

The above results revealed that almost two thirds of study respondents were GPs, one third have had experience less than five years. Serving in the community health facilities requires qualified health professionals with adequate training and experience to manage the wide range of health problems encountered by clients attending the health centers. Low experience of respondents may give a prediction to expect a level of non-adherence to

protocols of proper prescribing and raise the need for training courses and instructions to strengthen their skills in proper prescribing behaviors.

Table (4.1): Demographic characteristics of study respondents

Items	Frequency	%
Age		
30 Yrs and less	31	26.1
From 31 to 40 Yrs	53	44.5
41 to 50 Yrs	15	12.6
More than 50 Yrs	20	16.8
Total	119	100.0
Sex		
Male	85	71.4
Female	34	28.6
Total	119	100.0
Job Position		
Managerial position	11	9.1
Specialist	32	26.4
General Practitioner (GP)	78	64.5
Total	121	100
Specialty		
Obstetric	4	12.5
Pediatrician	14	43.8
Dentist	11	34.4
Ophthalmologists	2	6.3
Others	1	3.1
Total	32	100.0
Community served by facility		
Camp	66	56.9
Outside camp	41	35.3
Both	9	7.8
Total	116	100.0
Place of graduation		
Arab countries	49	41.5
Non-Arab countries	51	43.2
Palestine	18	15.3
Total	118	100.0
Experience		
5 Yrs and less	36	30.3
From 6 - 10 Yrs	37	31.1
From 11 - 20 Yrs	23	19.3
More than 20 Yrs	23	19.3
Total	119	100.0

4.2 Knowledge, attitudes and practice toward drug prescription

Table (4.2): Prescribers' knowledge regarding prescribing drugs

Items	No.	%
The correct answer for essential drugs is:		
Drugs that satisfy the health care needs of the majority of the population	103	88.0
Drugs that are second rate drugs for poor countries and rural areas only	7	6.0
Cheap medicines for poor people	4	3.4
medicines for mild diseases , they do not work for severe disease	2	1.7
Nothing	1	0.9
Total	117	100.0
The meaning of generic name is:		
The trade name	10	8.4
The chemical name and the INN	107	89.9
The market name	2	1.7
Total	119	100.0
Knowing the generic name for drugs prescribed at health facility		
Yes, all of them	71	59.2
Most of them	40	33.3
Some of them	8	6.7
No	1	0.8
Total	120	100.0
Familiarity with the concepts of standards treatment guidelines		
Yes	104	88.1
No	14	11.9
Total	118	100.0
Labeling drugs in Arabic language		
Always	9	7.4
Sometimes	69	57.1
Never	31	25.6
Do not know	12	9.9
Total	121	100.0

Table 4.2 shows that 88% of study participants reported knowing the meaning of essential drugs, 89.9% know the meaning of generic name, 59.2% knew the generic name for all the drugs prescribed at their health centers and 33.3% know the generic name for most of the drugs. Regarding treatment guidelines, 88.1% of the study participants were familiar with

the concepts of standards treatment guidelines. Regarding drug labels, only 7.4% of study participants reported that drug labels were always available in Arabic language and 57.1% reported that labels were sometimes written in Arabic language.

The above results revealed that prescribers working at UNRWA health care centers were knowledgeable regarding drugs in general, as the vast majority of them reporting knowing the meaning of generic names and they were familiar with standard treatment guidelines. These results varied from the findings of Fattouh (2005) which showed that 94.3% of study participants were knowledgeable about the essential drugs concept, 52.2% knew the correct generic name of drugs, while the results of Saleh (2008) showed that 48.2% of study participants know the correct generic name of drugs and 71.4% reported that knowing the generic name of drugs was valuable.

These results emphasize the need to adhere exactly to prescribing protocols by prescribers through instructions, educational programs and follow up.

Table (4.3): Prescribers' attitudes toward generic name of drugs

Items	No.	%
Beliefs about the use of generic drugs in comparison to their branded ones		
Generally positive	54	45.8
Satisfactory	58	49.2
Rather bad	6	5.0
Total	118	100.0
Beliefs about the safety of generic name of drugs in comparison to their branded ones in prevention of dispensing errors		
Generally positive	63	52.5
Satisfactory	46	38.3
Average	11	9.2
Total	120	100.0
Beliefs about the easiness of using generic drugs in comparison to their branded ones		
Generally positive	38	32.2
Satisfactory	57	48.3
Average	20	17.0
Bad	3	2.5
Total	118	100.0
Thinking that it is feasible to implement a prescribing system based on the generic name		
Highly feasible	26	21.8
Feasible	78	65.5
Rather impossible	13	10.9
Impossible	2	1.7
Total	119	100.0
Thinking that it is important to know the generic names of drugs		
To high extent	103	85.8
To some extent	16	13.3
Not at all	1	0.8
Total	120	100.0

Table 4.3 shows that, 45.8% of study participants thought that the use of generic name for drugs is an excellent approach and 49.2% thought that it is satisfactory, 52.5% thought that the safety of using generic name is excellent and 38.3% thought that it is satisfactory, 32.2% thought that using generic name is easy to an excellent degree and 48.3% thought that it is easy to a satisfactory degree, 21.8% thought that it is very feasible to implement

generic name and 65.5% thought that it is feasible, 85.8% thought that the use of generic name is important to a high extent and 13.3% thought that it is important to some extent. The above results indicated that prescribers working at UNRWA health care centers have positive attitudes toward the use of generic names for drug prescriptions.

Table (4.4): Distribution of prescribers by their practices

Items	No.	%
Frequency of prescribing a generic product instead of a branded one		
Very Often	28	23.5
Often	66	55.5
Rarely	25	21.0
Total	119	100.0
Receiving any training courses regarding prescribing patterns of EDL UNRWA		
Yes	28	23.3
No	92	76.7
Total	120	100.0
Interest to attend another training courses		
Yes	105	89.0
No	13	11.0
Total	118	100.0
Having a copy of any of the standard treatment guidelines		
Yes	82	68.3
No	38	31.7
Total	120	100.0
Guidelines influence practice with regards to drug prescription		
Yes	100	82.6
No	21	17.4
Total	121	100.0
If yes, how did they influence practices		
Improve practice to high extent	64	63.4
Improve practice to some extent	37	36.6
Total	101	100.0

Table 4.4 shows that only 23.5% of respondents reported very often prescribing drugs using generic name and 55.5% reported often prescribing drugs using generic name. Only 23.3% of respondents received training courses regarding prescribing patterns according to EDL UNRWA formulary, however a positive thing is that 89% were interested in attending another training course. This result is lower than what found by Fattouh (2005)

study which shows that 34.4% of study respondents had attended training courses on EDL and 88.9% were interested in attending training courses in the future. Our results also showed that 68.3% of respondents reported having a copy of standards of treatment guidelines, 82.6% mentioned that these guidelines influenced their drug prescribing and 63.4% believed that the guidelines improved their practice to a high extent.

The study results of Saleh (2008) showed that 59% of participants reported that UNRWA EDL formulary was the source of information, 72.3% received standard treatment guidelines (STG) and 85.2% of them use it regularly, in addition, 64.3% of participants have received UNRWA EDL formulary, 28.6% faced problems in using it and 74.5% reported that it lead to improvement in prescribing patterns. Also, the results of Khatib (2008) showed that 50% of study participants have access to treatment guidelines and protocols and of them 68% used these protocols in practice.

The above results indicated that prescribers working at UNRWA health centers have good practices regarding drug prescriptions as reported by them.

Table (4.5): Prescribers' performance and documentation

Items				No.	%	
Assessing health condition of the patient before prescribing drugs						
Regularly				113	94.2	
Sometimes				6	5.0	
Not at all				1	0.8	
Total				120	100.0	
Documenting each prescription in the file of client regardless of the number of visits						
Yes				116	97.5	
No				3	2.5	
Total				119	100.0	
Documenting diagnosis in patients' files						
Governorate	Yes		No		Total	
	No.	%	No.	%	No.	%
North	133	76.4	41	23.6	174	100.0
Gaza	351	83.0	72	17.0	423	100.0
Midzone	295	69.1	132	30.9	427	100.0
Khanyounis	200	91.7	18	8.3	218	100.0
Rafah	336	88.7	43	11.3	379	100.0
Total	1315	81.1	306	18.9	1621	100.0

Table 4.5 shows that 94.2% of respondents reported assessing the patients' health status regularly before prescribing drugs and 97.5% reported documenting each prescription in the patient's file. When looking to all the prescriptions under study, diagnosis was present in 81.1% of the prescription, the highest presence of diagnosis was in Khanyounis governorate (91.7%), followed by Rafah governorate (88.7%), Gaza governorate (83.0%), North governorate (76.4%) and Midzone governorate (69.1%).

When looking to the findings of other studies, it revealed inadequate diagnosis and details about the patient. Our result was lower than the results of Shurbasi and El-Rayyes (2004) which indicated that the overall rate of diagnosis documented among patients was 94.8%.

On the other hand, the results of Rahman (2010) showed that diagnoses of diseases documented only in about 52% of prescriptions, the results of Saleh (2008) showed that prescriptions without diagnosis accounted for 12.2% of all prescriptions. The results of Kumari (2008) indicated that the details of the chief complaints of the patients and the legibility of the prescriptions were significantly better in the prescriptions at the tertiary and secondary level, as compared to the primary health facilities.

The results of this study should be a worry for decision makers because medical diagnosis is fundamental for prescribing drugs and unavailability of medical diagnosis could give the impression that physicians prescribe drugs blindly for some patients. Emphasis on mandatory documentation of medical diagnosis for every prescription should be ensured through close monitoring, follow-up and taking disciplinary actions.

4.3 Essential Drugs List (EDL)

Table (4.6): Knowledge and attitudes regarding EDL

Items	No.	%
Having a copy of EDL		
Yes	107	88.4
No	14	11.6
Total	121	100.0
Availability of EDL		
Present in the drawer	14	13.2
Present in the physician desk	23	21.7
Present on computer	53	50.0
Others (in the manager's office, in the pharmacy ...)	16	15.1
Total	106	100.0
Using the EDL in drug prescription		
Currently using it	101	84.9
Used in the past	8	6.7
Not at all	10	8.4
Total	119	100.0
If currently using it		
Regularly	84	77.0
Sometimes	25	23.0
Total	109	100.0
The use of EDL is easy		
Yes	109	92.4
No	9	7.6
Total	118	100.0
Problem in using of EDL		
Yes, many	14	12.0
Yes , few	60	51.3
Not at all	43	36.7
Total	117	100.0
Drugs listed in EDL always available in your health facility		
Exclusively	43	36.4
Partly	65	55.1
No	6	5.1
Do not know	4	3.4
Total	118	100.0

Table 4.6 shows that the majority of study participants (88.4%) said that they have EDL available, while 11.6% did not have it, 50% said that it was available in the computer as a soft copy, 21.7% have it on the desk and 13.2% have it in the drawer. Results of this study

are higher than those of Fattouh (2005) which showed that 70.1% of respondents reported having a copy of EDL.

Also results showed that 94.2% of participants reported regularly assessing the health conditions of their patients before prescribing drugs, 97.5% of prescribers reported documenting each prescription in the patient's file. The result of this study revealed that the vast majority of study participants managed their patients properly as they assess their patients condition before prescribing their treatment plan, also they document that in the patient's file which is a legal practice that should be practiced by all prescribers as they reported.

The results also showed that 84.9% of participants reported currently using EDL in drug prescription, 92.4% found it easy to use, 36.7% did not notice any problem in using EDL and 51.3% found few problems. Regarding the availability of drugs, 36.4% of study participants reported that drugs from EDL are available exclusively, 55.1% reported that it was partly available. The above results indicated that respondents working at UNRWA health care centers have good attitudes regarding EDL prescriptions. The results of this study are better than those of Fattouh (2005) which showed that 67.4% of study participants were currently using the EDL, 88.2% found that it was easy to use EDL, 51.1% faced many problems in using EDL and 31.8% found few problems in using it.

4.4 Shortage of drugs

Table (4.7): Respondents experience and reasons for shortage of drugs

Items	No.	%
Experienced shortage of drugs		
Yes	78	65.3
No	41	34.7
Total	119	100.0
Reasons for shortage of drugs		
Inadequate drugs at the central store .	49	62.8
Lack of monetary resources to buy the drugs	6	7.7
Inaccurate estimation of the needed	4	5.1
Do not know	16	20.5
Others	3	3.8
Total	78	100.0

The results showed that 65.5% of study participants said that they had experienced shortage of drugs; and when asked about reasons for drugs' shortage, 62.8% related that to inadequate drugs at the central stores, 7.7% related that to shortage of financial support, 5.1% related it to inaccurate estimation of the amount of needed drugs and 20.5% did not know the reasons for the shortage of drugs.

The researcher believed that the reasons for drug shortage could be related to increased dispensing of drugs from UNRWA health centers by the patients in compensation to absence of some drugs in the MOH health centers this repeated shortage may reflect only one drug shortage and it is perceived as shortage and it may reflect communication issues rather than real shortage..

Table (4.8): Distribution of shortages by drug type (n = 73)

EDL shortage	Yes	
	No.	%
Antibiotic	47	64.4
Dermatological drugs	25	34.2
NSAIDs& Antigout	23	31.5
Non inventory	22	30.1
Antidiabetic	19	26.0
Ophthalmological preparation	16	21.9
Anti coagulant	13	17.8
Anticonvulsant	10	13.7
Anti Parkinson	9	12.3
Insulin	9	12.3
Anti infective drugs	8	11.0
Diuretics and anti hypertension	6	8.2
Psychotherapeutics	5	6.8
Vitamins	5	6.8
Others	5	6.8
Anti asthmatics	4	5.5
Gastrointestinal drugs	4	5.5
Hormones and contraceptives	1	1.4

Table 4.10 shows that 73 prescribers responded to this question, of them (64.4%) reported that shortage was in antibiotics, followed by dermatological drugs (34.2%), NSAIDs and Antigout (31.5%) and anti diabetic drugs (26%).

The study conducted by Fattouh (2005) showed that 43% of study participants reported experiencing shortage of antibiotics and 55% reported experiencing shortage in dermatological drugs and the study of Saleh (2008) reported that 55.4% of prescriptions contain antibiotics.

The researcher thinks that over-prescribing of drugs to satisfy patients' requests attributed to the problem of drug shortage. This problem could be solved by educational programs,

improving communication patterns between prescribers and pharmacy staff regarding availability and quantity of drugs available in the pharmacy. Also, monitoring the prescribers' adherence to prescribing guidelines could be another tool. In addition, health education programs to the patients to increase their awareness about problems encountered from over consumption of drugs.

4.5 Monitoring system

Table (4.9): Monitoring system for prescribed drugs

Items	No.	%
There is regular monitoring system for drugs prescribing		
Yes	106	89.1
No	7	5.9
Do not know	6	5.0
Total	119	100.0
Having a written technical instructions for prescribing that applied by UNRWA		
Yes	99	82.5
No	17	14.2
Yes, but not seen	4	3.3
Total	120	100.0
Receiving feedback about monitoring activities		
Yes, written	24	20.2
Yes, verbal	55	46.2
Via email	18	15.1
Not at all	22	18.5
Total	119	100.0
Actions taken regarding the feedback		
Keep it in the files without discussion	5	6.4
Discuss it with the concerned team	55	70.5
Use it in developing strategy	18	23.1
Total	78	100.0

The majority of the study participants (89.1%) said that there is a monitoring system for drug prescribing, 82.5% said that UNRWA has a written technical instructions for prescribing. Regarding feedback about monitoring activities, 46.2% of study participants reported receiving verbal feedback, 20.2% reported receiving written feedback, 15.1% reported receiving feedback via e-mail and 18.5% did not receive any feedback. Among those who received feedback, 70.5% had discussed the feedback with the concerned teams, 23.1% used it for developing strategy and 6.4% did not discuss it and kept it in files. The results of this study are better than those of Fattouh (2005) which showed that 46.2% of study participants reported the presence of an evaluation system, only 25.9% have been evaluated for their prescribing practice, 8.1% received written feedback and 35.3% received verbal feedback and 56.6% did not receive any feedback.

Even though the results revealed that the majority of study respondents reported that there was a monitoring system, but only 20.2% reported that they had received written feedback regarding their prescribing practices. The researcher believed that feedback is of great importance for improving practices and without feedback, monitoring would not be beneficial. Feedback regarding patterns of practice is a mean for reinforcing strong points and modifying weak points, leading at the end to improving practices among UNRWA prescribers.

4.6 Availability of protocols

Table (4.10): Availability of protocols

Items	No.	%
Having a written protocols to regulate the prescribing system		
Yes	85	70.2
No	36	29.8
Total	121	100.0
Adherence to the protocols		
Always	44	51.76
Sometimes	40	47.06
Never	1	1.18
Total	85	100.0

The results showed that 85 (70.2%) of respondents reported that they had written protocols to regulate the prescribing system and 36 (29.8%) reported that they did not had written protocols. These results should raise the question about availability of protocols in all health centers to be as a reference for prescribers. Unavailability of prescribing protocols as reported by one third of prescribers may explain the cause of polypharmacy and irrational prescribing. Further steps should be taken by decision makers to ensure availability of written protocols and periodic updating of these protocols.

Among those who reported having written protocols, only 51.76% of respondents reported adhering always to it and 47.05% reported adhering sometimes to protocols.

The above results indicated that written protocols are not available in all health centers as reported by respondents and that there is low adherence to these protocols, which may lead to inappropriate prescribing and polypharmacy.

4.7 Drug use indicators

Table (4.11): Results of drug use indicators

Item	Result	WHO standards
Average number of drugs per prescription	2.77	1.6 – 1.8
% of generic name from drugs	24.57	100%
% of prescribed antibiotics	32.9	20% - 26.8%
% of drugs from EDL	98.37	100%
% of prescribed injections	3.1	13.4% - 24.1%

Table 4.11 shows that the average number of drugs prescribed per encounter is 2.77 drugs. This result is high compared to WHO standards which recommended that average number of drugs per encounter should be less than 2 (WHO, 1993). The researcher attributed this high result due to the low percentage of prescribers' who attended training courses regarding prescribing behaviors. Also, the researcher assumes that some physicians prescribe drugs according to the patients' request rather than their health status. Other factors include free of charge drugs dispensing by UNRWA and inaccurate diagnosis which will lead to prescribing unnecessary drugs.

Previous studies conducted locally showed better results, as the average number of drugs prescribed per prescription was 1.92 (Fattouh, 2005), 2.0 drugs per prescription (Saleh, 2008) and 2.55 drug per prescription (Obeidalla, et al. 2000).

The results of this study are also consistent with the results of Bharti (2008) which showed that the average number of drugs per prescription was 2.8 and the results of Karande (2005) showed that the average number of drugs per encounter was 2.9. On the

other hand, the results of this study was higher than the results of Khatib (2008) which showed that average number of drugs was 1.9 per encounter.

The results of this study are better than many results including, the results of Babalola (2011) which showed that the overall mean of drugs per prescription was high up to 6.11 and the results of Kumar (2011) indicated that the mean number of drugs was 6.1 per encounter. Also, the results of Tamuno (2011) showed that average number of drugs per encounter was 3.2, also, the results of Rahman (2010) showed that 3 – 5 drugs per prescription were found in 77% of prescriptions and the results of Eze and Olowu (2011) showed that the mean number of medication per encounter was 3.9. Also, the results of Ashraf, et al. (2010) showed that the average number of drugs was 3.96 per prescription and the results of Vijayakumar, et al. (2011) showed that average number of drugs per prescription was 3.01 and more than four drugs were prescribed in 30% of prescriptions. In addition, the results of Upadhyay, et al. (2007) showed that average number of drugs was 3.76 per prescription. A study conducted in Iran found that the mean number of drugs prescribed per encounter was 4.4 (Moghadamnia, et al. 2002). Also, the results of Haldar, et al. (2011) showed that the average number of drugs was 3.7 per prescription.

Although, participants in this study were knowledgeable regarding generic name, but the results revealed a low commitment toward using generic name that the percentage of generic name accounted for 24.57% of prescribed drugs. This result is much better than previous studies conducted in Gaza Strip recently, in which the percentage of drugs prescribed by generic name accounted for 5.47% (Fattouh, 2005) and 4.5% (Saleh, 2008).

The results of Khatib study (2008) were lower than the results of this study and revealed that generic prescribing accounted for 24% of all medications prescribed, the study results of Vijayakumar, et al. (2011) found that only 27.3% of drugs were prescribed in generic

names. On the other hand; some studies reported higher results compared to the results of this study, including the results of Babalola study (2011) which showed that the overall percentage of generic prescriptions was 69.81%, while the results of Bharti study (2008) showed that the drugs prescribed by generic name accounted for 48.5% and the study results of Tamuno (2011) showed that generic prescriptions reached 55.4% of all medication and the results of Eze, Olowu study (2011) showed that medication prescribed by generic name accounted for 48.9%, the results of Karande study (2005) showed that 73% drugs were prescribed by generic name and the results of Moghadamnia, et al. (2011) revealed that 98% of drugs were prescribed by generic name. the results of Kumar, et al. (2011) found that 63.57% of the drugs were prescribed by their brand names. The results of Al-Kot, et al. study (2011) were high as 89.6% of drugs prescribed by generic name.

The researcher thinks that reinforcement of appropriate laws that make the use of generic name obligatory for all prescribers could solve this problem.

The percentage of drugs from EDL was 98.37, this result indicated high commitment of study participants toward using EDL as a reference for prescribing drugs. our result was consistent with the results of Fattouh study (2005) which showed that the percentage of drugs prescribed from the EDL accounted for 97.85%, the study conducted by Saleh (2008) showed that compliance to UNRWA EDL was 99.7%, the study conducted in Jordan by Otoom, et al. (2002) showed that the percentage of prescriptions including drugs from EDL was 93%, the results of Al-Kot, et al. (2011) showed that 94.7% of drugs were prescribed from the national EDL and the results of Babalola (2011) showed that the overall percentage of drugs prescribed from the EDL was 94.16%.

On the other hand, the results of this study were better than that of Bharti (2008) which reported that drugs prescribed from EDL accounted for 66.9%, in addition, the results of

Vijayakumar study (2011) reported that 41.6% of drugs were not in accordance with WHO EDL, the results of Karande study (2005) showed that 90.3% of prescribed drugs conformed to a model list of essential drugs. Also, the results of Kumar study (2011) found that only 45% of the drugs prescribed were from the WHO list of essential drugs, while the results of Haldar, et al. study (2011) found that 81% of prescribed drugs were from EDL.

The results of this study showed that the percentage of prescribed antibiotics was 32.9%. This result is higher than WHO standards which ranged between 20% to 26.8%. this result emphasize the need for instruction interventions to decrease the percentage of prescribed antibiotics.

Also, the result of this study were better than previous studies conducted locally including the study conducted by Saleh (2008) which showed that percentage of encounters received antibiotics were 55.4% and the study results of Shurbasi and El-Rayyes (2004) which showed that the rate of antibiotics prescription was 58.2%, while the results of this study were consistent with the result of Khatib, et al. study (2008) which showed that antibiotics accounted for 33% of all prescribed medications.

Some studies showed better results compared to the results of this study including the results of Bharti study (2008) which showed that antibiotics accounted for 22.5% of all prescribed drugs, the study results of Eze and Olowu (2011) showed that antibiotics accounted for 23% and the study results of Sepehri (2006) showed that antibacterial drugs accounted for 11.2% of prescribed drugs.

On the other hand, some studies showed higher results compared to the results of this study including the study results of Babalola (2011) which showed that 50.1% of prescriptions contained one or more antibiotics. Also, the results of Tamuno study (2011) showed that encounters with antibiotic prescription were high at 43.8%. The results of Rahman study

(2010) revealed that 58% of prescriptions having 1–2 antibiotics, while the results of Karande study (2005) showed that percentage of encounters with an antibiotic prescribed accounted for 39.6%. The study results of Ashraf, et al., (2010) showed that 43.19% of drugs prescribed were antibiotics, while the study conducted by Moghadamnia, et al. (2002) found that 61.9% of encounters contain antibiotics.

The results of this study showed that the percentage of prescribed injections was 3.1%. This result is much lower than WHO prescribing indicators (13.4% - 24.1%).

The results of Saleh study (2008) showed that the percentage of encounters receiving injections was 2.2%. On the other hand, the study results of Khatib, et al. (2008) showed that drugs administered by injection accounted for 16%, the results of Babalola study (2011) revealed that 72.7% of prescriptions contained one or more injections, the results of Bharti study (2008) showed that prescriptions that contain injections accounted for 13.6% and the results of Tamuno study (2011) showed that 18% of encounters had at least one injection prescribed.

Table (4.12): Differences in drugs indicators according to governorate

Items	Number of prescriptions	Mean drug per prescription	Std	F	P value
Drugs in general					
North	174	3.12	2.14	3.527	0.007
Gaza	423	2.81	1.76		
Midzone	427	2.83	1.76		
Khanyounis	218	2.53	1.55		
Rafah	379	2.63	1.72		
Total	1621	2.77	1.77		
Drugs from EDL					
North	174	3.10	2.12	3.643	0.006
Gaza	423	2.77	1.74		
Midzone	427	2.76	1.76		
Khanyounis	218	2.52	1.55		
Rafah	379	2.56	1.72		
Total	1621	2.72	1.77		
Generic name drugs					
North	174	0.28	0.73	25.082	0.001
Gaza	423	0.40	0.96		
Midzone	427	0.85	1.35		
Khanyounis	218	1.16	1.19		
Rafah	379	0.89	1.30		
Total	1621	0.72	1.20		

Table 4.12 shows that the general mean of prescribed drugs was ($m = 2.77 \pm 1.77$) per prescription. The highest number of drugs in general was in North governorate ($m = 3.12 \pm 2.14$) per prescription, and the lowest was in Khanyounis governorate ($m = 2.53 \pm 1.55$)

per prescription. Differences in number of drugs between governorates were statistically significant in favor of Rafah governorate as $F = 3.527$ and $P \text{ value} = 0.007$.

The highest number of drugs from EDL was in North governorate ($m = 3.10 \pm 2.12$) per prescription and the lowest was in Khanyounis governorate ($m = 2.52 \pm 1.55$). Differences in number of drugs from EDL between governorates were statistically significant in favor of Rafah governorate as $F = 2.378$ and $P \text{ value} = 0.05$.

The highest number of generic name drugs was in Khanyounis governorate ($m = 1.16 \pm 1.19$) per prescription and the lowest was in North governorate ($m = 0.28 \pm 0.73$) per prescription. Differences in number of generic name drugs were statistically significant in favor of Khanyounis governorate as $F = 25.082$ and $P \text{ value} = 0.001$.

The above results revealed that the highest rate of prescribing drugs in general and from EDL was among respondents from North governorate compared to other governorates. Prescribing using generic name was the highest among respondents from Khanyounis governorate. Results obtained from Fattouh (2005) showed that 84% of respondents from Rafah governorate prescribed drugs from EDL, 78.3% from Middle zone, 70.2% from Gaza, 66% from the north and the lowest 43.2% were from Khanyounis. In addition, the results of Saleh (2008) did not show statistical significant differences in drug prescription between different governorates.

Table (4.13): Differences in drugs indicators according to type of file

Items	Number of files	Mean drug per prescription	Std	F	Sig.
Number of drugs					
Child File	452	2.78	1.77	0.340	0.796
General File	528	2.82	1.93		
Mother File	308	2.70	1.60		
Chronic File	333	2.73	1.68		
Total	1621	2.77	1.77		
Number of drugs from EDL					
Child File	452	2.73	1.74	0.135	0.939
General File	528	2.75	1.92		
Mother File	308	2.67	1.60		
Chronic File	333	2.71	1.69		
Total	1621	2.72	1.77		
Generic name drugs					
Child File	452	0.78	1.17	3.090	0.026
General File	528	0.79	1.28		
Mother File	308	0.55	0.01		
Chronic File	333	0.70	1.27		
Total	1621	0.72	1.20		
Percentage of drugs from EDL					
Child File	452	98.60	8.83	0.939	0.421
General File	528	97.76	12.57		
Mother File	308	98.84	8.29		
Chronic File	333	98.57	10.38		
Total	1621	98.37	10.41		

Table 4.13 shows that the highest number of drugs was in general files ($m = 2.82 \pm 1.93$) per file, and the lowest was in mother files ($m = 2.70 \pm 1.60$) per file. Differences in number of drugs between files were statistically not significant as $F = 0.340$ and P value = 0.796.

The highest number of drugs from EDL was in general files ($m = 2.75 \pm 1.92$) per file and the lowest was in mother files ($m = 2.67 \pm 1.60$). Differences in number of drugs from EDL between files were statistically not significant as $F = 0.135$ and P value = 0.939.

The highest number of generic name drugs was in general files ($m = 0.79 \pm 1.28$) per file and the lowest was in mother files ($m = 0.55 \pm 1.01$). Differences in number of generic drugs between files were statistically not significant in favor of general files as $F = 3.090$ and P value = 0.026.

Also, the percentage of drugs prescribed from EDL was high in all types of files; the mean percentage was 98.37. Even though as mentioned before about two thirds of respondents faced some difficulties in using EDL, but it seems that they are trying hard to adhere to EDL, which indicated high commitment to prescribe using EDL.

Generally, the above results indicated that the highest prescription of drugs was in the general files of patients. This result could be attributed to the assumption that these patients usually do not have specific complain of a health problem, and require a combination of different drugs to manage their health problems.

Table (4.14): Differences in drugs prescribed according to onset of prescription

Items	N	Mean	Std	F	Sig.
Number of drugs					
First 10 days of the month	589	2.71	1.64	6.333	0.002
Second 10 days of the month	445	2.58	1.65		
Third 10 days of the month	587	2.96	1.97		
Total	1621	2.77	1.77		
Drugs from EDL					
First 10 days of the month	589	2.67	1.64	5.873	0.003
Second 10 days of the month	445	2.54	1.62		
Third 10 days of the month	587	2.91	1.96		
Total	1621	2.72	1.77		
Number of Generic name drugs					
First 10 days of the month	589	0.64	1.03	8.868	0.000
Second 10 days of the month	445	0.61	1.03		
Third 10 days of the month	587	0.89	1.44		
Total	1621	0.72	1.20		
Percentage of drugs from EDL					
First 10 days of the month	589	98.45	9.70	0.725	0.484
Second 10 days of the month	445	98.76	8.42		
Third 10 days of the month	587	97.99	12.30		
Total	1621	98.37	10.41		

Table 4.14 showed that the highest number of prescribed drugs was in the third 10 days of the month ($m = 2.96 \pm 1.97$) and the lowest was in the second 10 days of the month ($m = 2.58 \pm 1.65$). Differences were statistically significant in favor of third 10 days as $F = 6.333$ and P value = 0.002.

The highest number of drugs from EDL was in the third 10 days of the month ($m = 2.91 \pm 1.96$) and the lowest was in the second 10 days of the month ($m = 2.54 \pm 1.62$). Differences in number of drugs from EDL were statistically significant in favor of third 10 days as $F = 5.873$ and $P \text{ value} = 0.003$.

The highest number of generic name drugs was in the third 10 days of the month ($m = 0.89 \pm 1.44$) and the lowest was in the second 10 days of the month ($m = 0.61 \pm 1.03$). Differences in number of drugs from EDL between were statistically significant in favor of third 10 days of the month as $F = 8.868$ and $P \text{ value} = 0.000$.

The results showed that there were no significant differences in percentage of drugs from EDL in relation to days of the month as $F = 0.725$ and $P \text{ value} = 0.484$.

The above results indicated that the number of prescribed drugs, number of drugs from EDL and number of generic drugs were higher in the third 10 days of the month. This result was inconsistent with the results of Fattouh (2005) which showed that the highest mean of prescribed drugs was in the first 10 days of the month.

This result could be logic as some health centers receive their monthly drug stock around the second half of the month; for example Rafah health center receive their drug stock on the 18th of the month and Tal-sultan health center receive their stock on the 20th of the month, and consequently more clients will come to the health center in these days especially those with chronic disease who receive their amount of prescribed drugs monthly on a regular basis.

Table (4.15): Differences in prescribed antibiotics according to governorate

Governorate	Yes		No		Total		X ²	P value
	No.	%	No.	%	No.	%		
North	58	33.3	116	66.7	174	100.0	9.507	0.050
Gaza	130	30.7	293	69.3	423	100.0		
Midzone	165	38.6	262	61.4	427	100.0		
Khanyounis	68	31.2	150	68.8	218	100.0		
Rafah	112	29.6	267	70.4	379	100.0		
Total	533	32.9	1088	67.1	1621	100.0		

Table 4.15 shows that the average percentage of antibiotics prescription accounted for 32.9%; the highest prescription was in Midzone (38.6%) and the lowest was in Rafah governorate (29.6%). Differences in antibiotics prescription in relation to governorate were statistically significant in favor of Midzone as Chi square = 9.507 and P value = 0.050. These results of Saleh (2008) which showed that the highest antibiotic prescription was for Gaza governorate (62.5%) and the lowest was for the middle governorate (48.8%).

These results revealed a high rate of prescribing antibiotics, which needs further review and allocate strict guidelines for prescribing antibiotics. Frequent use of antibiotics increase the chance for bacteria to develop resistance, side effects and it is a waste of resources.

Table (4.16): Differences in prescribed injections according to governorate

Governorate	Yes		No		Total		X ²	Sig.
	No.	%	No.	%	No.	%		
North	13	7.5	161	92.5	174	100.0	12.161	0.061
Gaza	10	2.4	413	97.6	423	100.0		
Midzone	11	2.6	416	97.4	427	100.0		
Khanyounis	6	2.8	212	97.2	218	100.0		
Rafah	11	2.9	368	97.1	379	100.0		
Total	51	3.1	1570	96.9	1621	100.0		

Table 4.16 shows that the average percentage of prescribed injections was 3.1%; the highest prescription of injections was in North governorate (7.5%) and the lowest was in Gaza governorate (2.4%). The differences in injections prescription between governorates was statistically not significant as Chi square = 12.161 and P value = 0.061.

These results revealed low rate of prescribing injectable drugs, which could be related to the fact that oral drugs are easier to use by clients and could be taken at home. Injectable drugs are given in the health center and requires that the patient should come to the health center each time he needs an injection, especially antibiotics which needs one or more injection every day.

Chapter Five

Conclusion and recommendations

5.1 Conclusion

UNRWA has developed its drug formulary EDL on 1999 for the purpose of improving drug prescribing and utilization. Monitoring and periodic evaluation of prescribing patterns using proper measuring tools is necessary to assure improvement in this regard.

This study aimed to assess knowledge, attitudes and practice regarding prescribing patterns and to examine prescribers' adherence to international standards of drug use indicators. This study was retrospective, cross-sectional and was carried out at all UNRWA health centers in GS (20 health centers).

The study participants consisted of 119 prescribers working at UNRWA health care centers (71.4% males and 28.6% females), of them, 9.1% had managerial position, 26.4% specialists and 64.5% GPs.

Regarding KAP about prescription patterns, the results of the study revealed that prescribers working at UNRWA health care centers were knowledgeable regarding drugs. The majority of them reporting knowing the meaning of generic name and they were familiar with standard treatment guidelines. Also, the results indicated that prescribers have positive attitudes toward the use of generic names for drug prescriptions. In addition, the results showed that 23.5% of study participants prescribe generic drugs very often and 55.5% prescribe generic drugs often, less than one fourth received training courses regarding prescribing patterns but it was impressive that 89% were interested in attending training course.

Regarding assessment and documentation, the results showed that the vast majority (94.2%) of respondents reported that they assess the patients' health status regularly before prescribing drugs and 97.5% document each prescription in the patient's file, but when looking through the selected prescriptions, medical diagnosis was documented in only 80.7% of clients' files. This result should raise the attention toward the importance of documentation in all patients' files.

Regarding knowledge and attitudes about EDL, the results indicated that respondents have good attitudes regarding EDL prescriptions, as 88.4% said that EDL was available in their health center, 84.9% currently using EDL in drug prescription and 92.4% found it easy to use EDL.

Concerning shortage of drugs, 65.3% of study participants reported that they experienced shortage of drugs; of them 62.8% related that to inadequate drugs at the central stores and 7.7% related that to shortage of financial support. The main shortage was in antibiotics and this is of great worry because of its importance of managing diseases caused by bacterial infection, taking in consideration that more than one third of prescriptions contain antibiotics.

Recently, UNRWA facing some problems regarding financial support of its increasing services as a result of the hardship conditions in GS due to the strict siege imposed by Israelis.

Concerning monitoring and feedback, the majority of study participants (89.1%) reported that there was a monitoring system for prescribing of drugs, 82.5% said that there was a written technical instructions for prescribing, but only 20.2% received written feedback.

Appropriate feedback is of great importance to overcome problems and for improving practice.

Concerning adherence to protocols, 70.2% of respondents reported that they have written protocols to regulate the prescribing system, 98.8% of them adhere always or sometimes to protocols and GPs are adhering to protocols more than specialists and managers.

Concerning drug use indicators, the results indicated polypharmacy as the mean number of drugs prescribed per prescription was 2.84, which is higher than WHO standards, also percentage of prescribed antibiotics was high. On the other hand, prescribing using generic name was very low (31.83%) and the standard is 100%, and the percentage of drugs prescribed by injection was very low. These results revealed poor adherence to international standards of drug use indicators and special interventions should be taken to follow these indicators.

The results showed that the highest rate of drugs prescribed was in Rafah governorate ($m = 3.01 \pm 2.05$) per prescription, and the lowest was in Khanyounis governorate ($m = 2.56 \pm 1.69$) per prescription, the highest number of drugs from EDL was in Rafah governorate ($m = 2.95 \pm 2.05$) per prescription and the lowest was in Khanyounis governorate ($m = 2.54 \pm 1.67$) and the highest number of generic name drugs was in Khanyounis governorate ($m = 1.56 \pm 1.21$) per prescription and the lowest was in North governorate ($m = 0.23 \pm 0.66$) per prescription.

Concerning files' type, the highest number of prescribed drugs was in general files ($m = 2.82 \pm 1.93$) per file, and the lowest was in mother files ($m = 2.70 \pm 1.60$) per file, the

highest number of drugs from EDL was in general files ($m = 2.75 \pm 1.92$) per file and the lowest was in mother files ($m = 2.67 \pm 1.60$) and the highest number of generic name drugs was in general files ($m = 0.79 \pm 1.28$) per file and the lowest was in mother files ($m = 0.55 \pm 0.01$).

The results also showed that the percentage of prescriptions containing antibiotics accounted for 32.9%; the highest was in Midzone (38.6%), and the lowest was in Rafah governorate (29.6%). Also, the results showed that the percentage of prescribed injections was 3.1%; the highest was in North governorate (7.5%) and the lowest was in Gaza governorate (2.4%).

The study concluded that further interventions should be taken to acquire rational prescribing and standards of drug use indicators. This could be achieved through implementing proper educational and administrative strategies.

5.2 Recommendations

In the light of the study results, the researcher recommends the following:

- Review of the monitoring system to ensure accurate data collection and effective feedback and follow up of prescribing patterns.
- Strategies to improve drug use are required to avoid waste of scarce resources and to optimize patient care and the overall quality of health care.
- Implementing training programs regarding UNRWA prescribing policy and EDL formulary. These programs should be obligatory and done regularly to all prescribers.
- Prescribing using generic name should be mandatory to all prescribers and pharmacists should not dispense any drug prescribed by trade name.
- Assure the presence of medical diagnosis in every patient's file.
- Assure the availability of drug formulary on hand for every prescriber.
- Working toward decreasing the number of prescribed antibiotics through establishing special guidelines and protocols for prescribing antibiotics.

5.3 Suggestions for further research

- To conduct a study on drug prescribing patterns in both governmental, private and UNRWA primary health care centers to have better insight and make comparisons between different sectors.
- To conduct a study that focus on patients care indicators and health facility indicators.
- To conduct a meta-analysis study for the previous available Palestinian studies about drug prescribing patterns.

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Annexes

Annex (1) Prescription patterns Questionnaire

Research title: Prescribing Patterns and Practices at UNRWA Health Centers: Gaza

My name is Mona Arafat. I am master of public health student at Al Quds University- Palestine .I am conducting this research as a part of my study at the university.

The study aims: To assess prescribers' knowledge, attitudes and practices in relation to prescribing medications. I appreciate very much your participation in this study. The Self administered questionnaire takes 10-15 minutes

Participation in this study is voluntary and you have the right to withdraw at any time. Confidentiality will be provided, no need to write down your name.

Answer the questions as you feel and practice in the reality.

Thank you very much in advance for your collaboration.

Mona El Baba

0599242616

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Questionnaire

Section A: General Information

1-UNRWA health center name.....

2-Age.....

3-Gender of prescriber is.....

2-The job position of prescriber at the clinic is

a-Managerial b- Specialist c- General practitioner

3- If you are specialist what is your specialty about?

a-Obstetric/gynecologist specialist b-Pediatrician c-Dentist
d- Dermatologist e-Ophthalmologist- f- Others/specify.....

4-What is the number of year of experience?years

5- From which country you finish your study?

6-Community served by facility a- Camp b- Non camp

Section B: Prescribing patterns and practice

7-Do you have written protocols to regulate the prescribing system in your facility?

a- yes b-no, (if no go to question 12)

8- Availability of the protocols for prescribing

a-Present on the wall of the room where services are provided b-Present in computer

c-Present at the physician desk d-Present on the computer

e-Present in other places (specify)

9- What is the source of protocols for prescribing you have?

a- National b-WHO c-UNRWA formulary d- Facility developed e- Others

10- In your opinion, how often do prescribers adhere to the protocol in their prescribing habits?

- a- Always b- Sometimes c- Never

11- If used, is it used friendly and continuously?

- a- Yes to high extent b- Yes to some extent c- No

12- Do you have a copy of the essential drugs list (UNRWA drug formulary)?

- a- Yes b- No (If no go to Q17)

13- Availability of the EDL (drug formulary for UNRWA) and so (the data collector must observe the site of them)

- a- Present in the drawer b- Present at the physician desk
c- Present on the computer d- Present in other place (specify)

14- Who usually places drug orders for your facility?

- a- The staff of clinic itself.
b- the central pharmacy
c- more than one part
d- Pharmacy Team
e- Do not know

15- UNRWA-Drug formulary is regularly the base that is used for ordering drugs in this facility?

- a- To high extent. b- To some extent. c- Do not know

16- How does your facility usually order the needed drugs from central drug store?

- a- Regularly, every 8-week. b- Based on consumption -c- Based on morbidity.
d- Based on consumption and morbidity and regularly, every 8 weeks

17-Is there a regular monitoring system for drug management in your facility?

a- Yes, regularly b-No c-Do not know..

18-Do you have written technical instructions for prescribing that applied by UNRWA.

a-Yes b-No. c-yes, I didn't see it

19-Did you receive feedback about monitoring?

a-Yes, written feedback b-yes, verbal feedback.

c-with email feedback d-not at all

20-If yes, what you do with this feedback?

a- Keep it in files without discussion. b-Discuss it with the concerned team.

c-Use it in developing strategy

21- Have you experienced shortage of drugs in your facility in the last six months?

a-Yes b-No. (If no go to Q 24)

22-Reason for shortage of drugs you have experienced

a-Inadequate drugs at the central store .

b-Lack of monetary resources to buy the drugs.

c-Inaccurate estimation of the needed

d- Do not know. e-Others, specify

23-Please specify the group of drugs where there is usually shortage according to EDL (drug formulary) at UNRWA health centers.

No.	✓	Drug Group	No.	✓	Drug Group	No.	✓	Drug group
1		Antibiotic	7		Dermatological	13		Vitamins
2		NSAIDs& antigout	8		Diuretics and anti hypertension	14		Antidiabetic
3		Anticonvulsant	9		Gastrointestinal	15		Insulin
4		Anti infective drugs	10		Hormones and contraceptives	16		Non inventory
5		Anti Parkinson disease	11		Ophthalmological preparation	17		Anti asthmatics
6		Anticoagulant	12		Psychotherapeutics	18		others

Section C: knowledge and attitude:

24-What do essential drugs mean to you?

a-Drugs that satisfy the health care needs of the majority of the population and must be available in all times

b-Drugs that are second rate drugs for poor countries and rural areas only

c-Cheap medicines for poor people

d – Medicines for mild diseases, they do not work for severe disease

e –Nothing

25-Do you know what is the meaning of generic name?.

a-The trade name .

b- The chemical name and the INN (international Nonproprietary Name).

c-the market name.

26- Do you know the generic name for drugs you prescribe at this facility?

a-Yes all of them b-Most of them c-Some of them d- No

27-What do you think about the use of generic drugs in comparison to their branded ones?

a- Excellent b- Satisfactory c- Rather bad d- Bad

28- What do you think about the safety of generic in comparison to their branded ones in prevention of dispensing errors?

A-Excellent b- Satisfactory c- Average d-Bad

29- What do you think about the easy use of generics in comparison to their branded ones?

a-Excellent b- Satisfactory c-Average d-Rather bad

30-How often do you prescribe a generic product instead of a branded one?

a-Very often b-Often c-Rarely d-Hardly ever

31-Do you think it is feasible to implement a prescribing system based on the Generic Name?

a-Very feasible b-Feasible c-Rather impossible d-Impossible

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32- To what extent do you think it is important to know the generic names of drugs?

a-To high extent b- to some extent c-not at all

33-Did you receive any training courses regarding prescribing patterns of essential drug of UNRWA Formulary?

a- Yes b- No

(If yes indicate the date of last training course ----/---/---)

34-Are you interested to attend another training course regarding prescribing of essential drug list at UNRWA (Drug Formulary)

a-Yes b-No

35- Are you familiar with the concepts of standard treatment guidelines?

a- Yes b-No

36-Do you have a copy of any of the standard treatment guidelines?

a-Yes b- No

37-Did these guidelines influence practice with regard to drug prescription?

a-Yes b-No

38-If yes how did they influence practices?

a-Improve practice to high extent b-Improve practice to some extent

39- Are the drugs in your facility labeled in Arabic language?

a-Always b-Sometimes c-Never d- I do not know

Section D: Physician Practice:

40- Do you usually asses health condition of the patient before prescribing drugs?

a-Regularly b-Sometimes c- Rarely d- Not at all

41-Do you document each prescription in the file of client regardless of the number of visits to the clinic?

a-Yes b- No

42-Do you use the EDL (UNRWA drug formulary) in your drug prescription?

a-Currently using it b-Used in the past c-Not at all (If no go to Q33)

43-If currently using it

a-Regularly b- Sometimes

44-Do you find that the use of EDL (drug formulary) is easy?

a-Yes b-No

45- Have you noticed any problem in using of EDL (drug formulary)?

a-Yes, many b-Yes, few c-Not at all

46 – Are the drugs on EDL always available in your health facility?

a-Exclusively b –Partly c-No d-I don't know

Annex (2) Checklist

Date	File No.	Gender	No. of drugs	EDL	Generic name	Antibiotics	Analgesics	Diagnosis	injections

Annex (3): Tables of inferential analysis

Protocols and respondents' position

	Managerial		Specialist		General		Total	
	No.	%	No.	%	No.	%	No.	%
Having a written protocols to regulate the prescribing system								
Yes	9	10.6	21	24.7	55	64.7	85	100.0
No	2	5.6	11	30.6	23	63.9	36	100.0
Total	11	9.1	32	26.4	78	64.5	121	100.0
Chi square =4.213 P value = 0.239								
Adherence to the protocols								
Always	2	4.5	7	15.9	35	79.5	44	100.0
Sometimes	7	17.5	14	35.0	19	47.5	40	100.0
Never	0	0	0	0	1	100.0	1	100.0
Total	9	10.6	21	24.7	55	64.7	85	100.0
Chi square=10.289 P value = 0.036								

The above table shows that 85 prescribers reported that they had written protocols to regulate prescribing system. Differences regarding position were not significant as Chi square = 4.213 and P value = 0.239. Also, 44 prescribers adhere to protocols always, 40 adhere sometimes.

Generic name of drugs and position

	Managerial		Specialist		General		Total	
	No.	%	No.	%	No.	%	No.	%
The meaning of generic name								
The trade name	1	10.0	3	30.0	6	60.0	10	100.0
The chemical name and the INN	10	9.3	27	25.2	70	65.4	107	100.0
The market name	0	0.0	1	50.0	1	50.0	2	100.0
Total	11	9.2	31	26.1	77	64.7	119	100.0
Chi square =0.829 P value = 0.934								
Frequency of prescribing a generic product instead of a branded ones								
Very often	3	10.7	6	21.4	9	67.9	28	100.0
Often	7	10.6	16	24.2	43	65.2	66	100.0
Rarely	1	4.0	9	36.0	15	60.0	25	100.0
Total	11	9.2	31	26.1	77	64.7	119	100.0

Chi square =2.335 P value = 0.674

The above table shows that 107 prescribers knew the meaning of generic name of drugs. Differences regarding position were not significant as Chi square = 0.829 and P = 0.934. Also, 28 prescribers use generic names very often, 66 prescribers use it often and 25 use it rarely. Differences regarding position were not significant as Chi square = 2.335 and P value = 0.674.

Concept of standards treatment guidelines and position

	Managerial		Specialist		General		Total	
	No.	%	No.	%	No.	%	No.	%
Familiarity with the concepts of standards treatment guidelines								
Yes	10	9.6	23	22.1	71	68.3	104	100.0
No	1	7.1	7	50.0	6	42.9	14	100.0
Total	11	9.3	30	25.4	77	65.3	118	100.0
Chi square =5.076 P value = 0.079								

The above table shows that 104 prescribers were familiar with the concept of standards treatment guidelines. Differences regarding position were not significant as Chi square = 5.076 and P value = 0.079.

Easiness of using EDL and position

	Managerial		Specialist		General		Total	
	No.	%	No.	%	No.	%	No.	%
The use of EDL is easy								
Yes	11	10.1	30	27.5	68	62.4	109	100.0
No	0	0.0	1	11.1	8	88.9	9	100.0
Total	11	9.3	31	26.3	76	64.4	118	100.0
Chi square =2.667 P value = 0.264								
Problems in using of EDL								
Yes, many	2	14.3	4	28.6	8	57.1	14	100.0
Yes, few	6	10.0	14	23.3	40	66.7	60	100.0
Not at all	3	7.0	13	30.2	27	62.8	43	100.0
Total	11	9.4	31	26.5	75	64.1	117	100.0
Chi square =1.302 P value = 0.861								

The above table shows that 109 prescribers reported that the use of EDL is easy and only 14 prescribers found many problems in using EDL, 60 prescribers found few problems and

43 prescribers did not find any problems. Differences regarding position were not significant as Chi square = 1.302 and P value = 0.861.

Annex (4): Helsinki Committee approval

**Palestinian National Authority
Ministry of Health
Helsinki Committee**



**السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي**

التاريخ : 07/03/2011

Name: Mona Arafat

الاسم: منى عرفات

I would like to inform you that the committee
has discussed your application about:

نفيكم علماً بأن اللجنة قد ناقشت مقترح دراستكم
حول:-

" Drugs prescribing patterns and practices at
UNRWA health centers-Gaza Governorates."

In its meeting on March 2011
and decided the Following:-

و ذلك في جلستها المنعقدة لشهر 3 2011
وقد قررت ما يلي:-

To approve the above mention research study.

الموافقة على البحث المذكور عالياً.

Signature

توقيع

Member

Member

Chairperson

عضو

عضو

رئيس

Conditions:-

- ❖ Valid for 2 years from the date of approval to start.
- ❖ It is necessary to notify the committee in any change in the admitted study protocol.
- ❖ The committee appreciate receiving one copy of your final research when it is completed.

Annex (5): UNRWA approval

Annex (5): UNRWA approval

Al-Quds University
Jerusalem
School of Public Health



جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2011/7/3

Approved


O.I.C/HP

حضرة الدكتور محمد المقادمة
مدير برامج الصحة - وكالة الغوث
تحية طيبة وبعد،،،

11.7.11

الموضوع: مساعدة الطالبة منى عرفات البابا

تقوم الطالبة المذكورة أعلاه بإجراء بحث بعنوان:

"Drugs Prescribing Patterns and Practices at UNRWA Health Centers-Gaza Governorates"

كاستغلب المحصول على درجة الماجستير في الصحة العامة-مسار الإدارة الصحية. و عليه نرجو التكرم بالإيعاز لمن ترونه مناسب لتسويل مهمة الطالبة في جمع البيانات اللازمة من الصيدليات التابعة لإدارتكم الموقرة. علماً بأن المعلومات ستكون متوفرة لدى الباحث و الجامعة فقط.



و اقبلوا. فائق الصحة و الاحترام،،،


د. بسام أبو حمدة

منسق عام برامج الصحة العامة

تسعة:

- ثلاث

ملخص الدراسة

تتطرق هذه الدراسة إلى أنماط صرف الأدوية لما لهذا الموضوع من أهمية عظيمة من ناحية استخدام المريض للدواء بطريقة آمنة وللمؤسسة الصحية من ناحية التكلفة المادية للأدوية.

هدف الدراسة: هدفت هذه الدراسة إلى اختبار أنماط صرف الأدوية التي يتبعها الأطباء العاملين في المراكز الصحية التابعة لوكالة غوث وتشغيل الفلسطينيين في محافظات غزة، كما هدفت إلى معرفة مدى إتباع الأطباء للمعايير التي وضعتها منظمة الصحة العالمية كمؤشرات لاستخدام الدواء.

تكونت عينة الدراسة من جميع الأطباء العاملين في المراكز الصحية التابعة لوكالة غوث وتشغيل اللاجئين الفلسطينيين في محافظات غزة والبالغ عددهم 157 طبيب وطبيبة من كل المراكز الصحية والبالغ عددها 20 مركز صحي، واستجاب منهم 121 طبيب وطبيبة بنسبة بلغت 77.07% (85 طبيب و 36 طبيبة).

لجمع البيانات، قامت الباحثة بإعداد استبانة تم عرضها على فريق من المحكمين للتأكد من صدق المحتوى، كما تم استخدام قائمة المعايير وذلك بناءً على المعايير التي وضعتها منظمة الصحة العالمية عام 1993 حول مؤشرات الوصفة الطبية الرشيدة.

لتحليل البيانات تم استخدام المعالجات الإحصائية الوصفية والتي تضمنت التكرارات، المتوسط الحسابي والانحراف المعياري، كما تم استخدام اختبار تحليل التباين الأحادي ومربع كاي.

بينت نتائج الدراسة أن 88% من الأطباء المشاركين في الدراسة كانوا يعرفون معنى مصطلح قائمة الأدوية الأساسية، 89.9% يعرفون معنى الاسم العلمي للأدوية، 59.2% يعرفون الاسم العلمي لكل الأدوية التي يتم وصفها للمرضى و 33.3% كانوا يعرفون الاسم العلمي لغالبية الأدوية، 88.1% كانوا على معرفة بالطرق المثالية للوصفات الطبية. وبينت النتائج أن 23.5% من الأطباء كانوا يستخدمون الاسم العلمي للدواء دائماً، 55.5% كانوا يستخدمون الاسم العلمي غالباً، كما أن 23.3% من الأطباء أفادوا بأنهم تلقوا دورات تدريبية حول المعايير السليمة لكتابة الوصفات الطبية. وقد أفاد 88.4% من الأطباء بوجود القائمة الأساسية للأدوية في المراكز الصحية، و 84.9% كانوا

يسترشدون بتلك القائمة عند كتابة الوصفات الدوائية، منهم 92.4% أفادوا بأن قائمة الأدوية الأساسية كانت سهلة الاستخدام. بالنسبة للنقص في الأدوية، فقد أفاد 65.3% من الأطباء بوجود نقص في بعض الأدوية، منهم 64.4% أفادوا بأن النقص كان في المضادات الحيوية، 34.2% أفادوا بأن النقص كان في أدوية الأمراض الجلدية، 31.5% أفادوا بأن النقص كان في الأدوية المسكنة للألم. وقد أفاد 89.1% من الأطباء المشاركين في الدراسة بوجود نظام مراقبة لطرق صرف الأدوية، 82.5% أفادوا بوجود تعليمات مكتوبة خاصة بالوصفات الطبية، وقد بين 20.2% من الأطباء بأنهم تلقوا تغذية راجعة مكتوبة بخصوص طرق صرف الأدوية.

بالنسبة لمؤشرات صرف الأدوية فقد بينت النتائج أن معدل صرف الأدوية بلغ 2.77 دواء لكل وصفة دوائية، وقد استخدم الاسم العلمي في 24.5% من الوصفات، وقد تم وصف مضادات حيوية في 32.9% من الوصفات الطبية، وقد بلغت نسبة الأدوية التي تم صرفها من القائمة الأساسية للأدوية 98.37%، في حين بلغت نسبة الحقن 3.1%. وبينت النتائج أن أعلى معدل صرف للأدوية كان في ملفات العائلة بمعدل 2.82 دواء لكل ملف، بينما كانت الأدنى في ملفات الأمهات بمعدل 2.7 دواء لكل ملف، كما كان أعلى معدل صرف للأدوية في الثلث الأخير من الشهر. وقد خلصت الدراسة إلى الحاجة لعقد دورات تدريبية للأطباء حول الوصف الرشيد للأدوية بما يتناسب مع معايير منظمة الصحة العالمية في صرف الأدوية.