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EFFECTS OF CO-PAYMENT ON DRUG RATIONAL USE AND COST RECOVERY AT GOVERNMENTAL PRIMARY HEALTH CARE IN GAZA

[1*]Dr. Yehia Abed, PH, [2]Khalid M Abu Saman, MPH and [3]Bassam Abu Hamad, Ph.D

[1,3]Al-Quds University, Faculty of Public Health, Gaza Strip Palestine
[2]Palestinian Ministry of Health, Primary Health Care, Gaza, Gaza Strip Palestine

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ABSTRACT

The irrational use of drugs leads to wasting of resources and serious health hazards as well. This study aims to ascertain the effect of co-payment on drugs consumption and also to assess drugs' cost recovery at the governmental primary health care sector in the Gaza Strip. A descriptive, analytical, cross sectional design using a retrospective multi-stage sampling approach were utilized with a sample of 1620 prescriptions randomly selected from 15 PHC clinics; 108 prescriptions from each designated clinic. Additionally, the researcher reviewed the pharmacy registry at the targeted clinics to ascertain drug costs and drugs availability. The study showed that, there are drugs exploitation particularly for fee-exempted patients, where the average number of drugs prescribed per prescription is 2.9 (4.5 for exempted, 2.2 for under 3 years non-exempted, and 2 for over 3 years non-exempted). The average percent of prescriptions which included antibiotics per clinic was 64% (79.1% for exempted, 66.3% for under 3 years and 47% for over 3 years). The availability of key drugs is reported in 82.8%. The average drug cost recovery through the currently in-use drug co-payment scheme is 84%, and the average prescription cost is 4.9 NIS (1.4 US). The study concluded that the introduction of co-payment scheme promotes the rational use of drug, generates additional in-house resources and promotes financial sustainability.

INTRODUCTION

The availability of essential medicines within primary health care (PHC) centers in adequate amounts at all times, in the appropriate dosage forms and at affordable prices is one of vital elements of Alma Ata Declaration (Declaration of Alma Ata, 1978). Drugs availability is a tangible indicator to good health system performance, and necessary to meet clients' expectation. Many of the drugs availability problems drive from irrational drugs describer, dispensing, behavior of health system, self-medication, financial and budgetary constraints. Rational drug use by dispenser, distributor, and public is crucial to improve health indicators, as well as to contain drugs expenditure (WHO, 2001[a]). These issues are also worrying for the Palestinian Government in general and for the Ministry of Health (MOH) in particular, which chronically suffers from scarcity of resources. With the economic collapse of the situation in Gaza, the demand for health services at the MOH premises has increased.

Corresponding author: Dr. Yehia Abed, PH,
Al-Quds University, Faculty of Public Health, Gaza Strip Palestine

Beside the inversely effect of large drugs spending on other health care services share, the irrational use of drugs represented by misuse, overuse, and underuse of appropriate drugs can lead to wasting of resources, health hazards and represents a major challenge to public policies. Therefore, there is a pressure on policy makers to ensure better use of drugs and to control the costs of drugs, but without decreasing health benefits (Austvoll *et al*., 2008). The health expenditure per capita varies between and within different countries. The government of poor countries forced to cut real per capita budget for health which make public health policy going to adopt new strategies including cost containment and cost recovery strategies, by using indiscriminate fees. As a result many poor household have faced large health expenditure relative to their income, difficulties in paying for necessary health services, which push them into poverty, with catastrophic consequences (WHO, 2004). The average out of pocket spending in the West Bank and Gaza in the last decade was around 40% of the total expenditure on health (PCBS and MOH, 2013). According to the Palestinian Ministry of Finance estimate, in 2005 there is deterioration of the Palestinian

health spending due to further steep in all Palestinian economic indicator in comparison with 2000 (MOH, 2006), all of these reasons increase the complexity of ensuring the availability of funds for procuring medications at governmental PHC. This study is the first one to be done in the Gaza Strip to study the drugs co-payment effect on drugs cost coverage and pharmaceutical utilization, so it will be a basis for decision maker to review the drugs financing and assumption system development. Findings also might be helpful for policy makers in analogous contexts.

MATERIALS AND METHODS

The design of this study is descriptive, analytical, cross sectional design to measure the effect of co-payment on drug prescribing pattern and also to assess drug cost recovery.

Sampling

According to the WHO recommendation on sampling frame for drug indicators; at cross sectional study, the recommended minimum sample size consists of 10 health facilities and 100 patients encounter per facility to be included (WHO, 1993). The study was conducted on 15 PHC clinics, one clinic from each level (II, III, IV) in each different geographical areas. Clinic level were defined as follows: level II (provide minimum services by full time nursing and physician), level III (in addition to level II services provide basic laboratory services, X-ray, dental care), level III (provide specialty services, x-ray, emergency care 24 hour daily beside services at lower levels), all prescriptions were written during the first six months of the year 2008 and obtained from pharmacy records. Reviewed prescriptions were studied for co-payment coverage percent of drugs cost, and co-payment relationships with drugs availability and also for the WHO drug use indicators such as poly pharmacy and use of antibiotics. Co-payment was categorized into three groups; prescriptions for three years and less children (pay 1 NIS per prescriptions), more than three years (pay 3NIS), and prescriptions for exempted patients. A random sample of 108 prescriptions were studied from each PHC center with total 1620 prescriptions from the 15 included centers.

Data collection

Data were collected during the period 1st June 2008 through 30th July by researcher and a trained Pharmacist from 15 governmental health centers. The WHO data abstract sheet was adopted with some modifications to meet study objectives including, average number of drugs prescribed per prescription, average number of antibiotics prescribed in the prescription, and checklist of some 12 drugs was established through discussion with PHC policymakers to check drugs availability. Researcher also revised relevant documents and made some observations that helped in exploring the reality. Another self-established sheet was used to calculate the cost of the total consumed drugs through first six months of the year 2008 and all its revenue. The research ethical principles were respected and maintained during the study and an approval from the National Helsinki Committee for research ethics was obtained. Also, an administrative approval from the General Directorate of PHC was obtained before starting data collection.

Data Analysis

The data were analyzed using the SPSS Software, version 17.0. The analysis process has started by running frequency of the different variables, followed by cross tabulation for specific study variables. Statistical formulas developed by the WHO were used to compute the selected WHO drug use indicators, finally advanced statistical analysis was used to explore the potential relationship between the study variables, including one way ANOVA test and Correlation test. P value was considered statistically significant when it is lower than 0.05 with confidence interval (CI) of 95%.

RESULTS

Prescribing indicators related results

The average number of drug per prescription is 2.9. The average increased by increasing the PHC level, where the highest value was shown in level IV (3.3) and the lowest level II (2.4). The exempted prescriptions had the highest mean number of drugs per prescription (4.5), and the values of this indicator were less in the other co-payment status. The difference was statistically significant with both change in PHC level and co-payment status (P = 0.001). Regarding antibiotics use the percent of prescriptions that included antibiotics was 64%, with no statistically significant differences in reference to the clinic level. The highest percent of prescriptions that include antibiotics was reported in the exempted prescriptions (79.1%) where the co-payment amount equals zero, and this percent decreased with the increase in the co-payment level and this difference was statistically significant (*P* value< 0.001) (table 1).

Table 1. Relationship between drug use indicators, and PHC level and the co-payment status using ANOVA test

Drug use indicators	variables	mean	F	*P-value*
1.Average number of drug per prescription				
1.1PHC level	Level II	2.4	38.5	0.001*
	Level III	3.0		
	Level IV	3.3		
	Exempted	4.5		
1.2Co-payment status	Under 3 year	2.2	588.2	< 0.001*
	Over 3 year	2.0		
2.Percentage of prescriptions which included antibiotics				
2.1 PHC level	Level II	62	1.2	0.31
	Level III	66.5		
	Level IV	63.9		
	Exempted	79.1		
2.2 Co-payment status	Under 3 year	66.3	65.9	0.001*
	Over 3 year	47		

Drugs use indicator and dispensing time

In general the study had shown the change in drug use and prescribing pattern was statistically significant with the variations in the dispensing time. The P value was less than (0.001) for both the number of drug per prescription and the percentage of prescription which included antibiotics; the highest mean was observed in first 10 days followed by the time from 11th to 20th and then in the last 10 days of the month (drugs are delivered to PHC centers on a monthly basis and usually on the first days of the month). The variations pertaining to exempted prescriptions were not statistically significant (table 2). But in under 3 year patients prescription

the variation is statistically significant where the "P" value was (0.001) and (0.006) in number of drug per prescription and percent of prescriptions which included antibiotic respectively. The same result was obtained for over 3 year patient's prescriptions where P value was less than (0.001) for both indicators (table 2).

Table 2. Relationships between co-payment amount and drugs use indicator during different days of the month using ANOVA test

Drug use indicators	Dispensing time	mean	F	P Value
No. of drugs per prescription for exempted prescriptions	First 10 days	4.69	2.10	0.123
	Second 10 days	4.41		
	Last 10 days	4.31		
No. of drugs per prescription for under 3 year prescriptions	First 10 days	2.51	18.625	0.0001*
	Second 10 days	2.19		
	Last 10 days	1.99		
No. of drugs per prescription for over 3 year prescriptions	First 10 days	2.69	94.42	0.001*
	Second 10 days	1.94		
	Last 10 days	1.38		
Percent of prescriptions which included antibiotics for exempted prescriptions	First 10 days	78%	0.178	0.837
	Second 10 days	81%		
	Last 10 days	78%		
Percent of prescriptions which included antibiotics for under 3year prescriptions	First 10 days	72%	5.09	0.006*
	Second 10 days	70%		
	Last 10 days	57%		
Percent of prescription which included antibiotics for over 3year prescriptions	First 10 days	56%	8.52	0.001*
	Second 10 days	51%		
	Last 10 days	47%		

**Statistically significant*

Drug availability

The availability of key drugs is 82.8%. The highest percent is in level II clinic (86.6%) to that extent it reaches 100% in some clinics. Followed by level III clinics (83.2%), and the lowest percent is reported in level IV clinics (78.4%) but these differences are not statistically significant (table 3).

Table 3. Comparison of drug availability and economic findings by the level of the clinic using ANOVA test

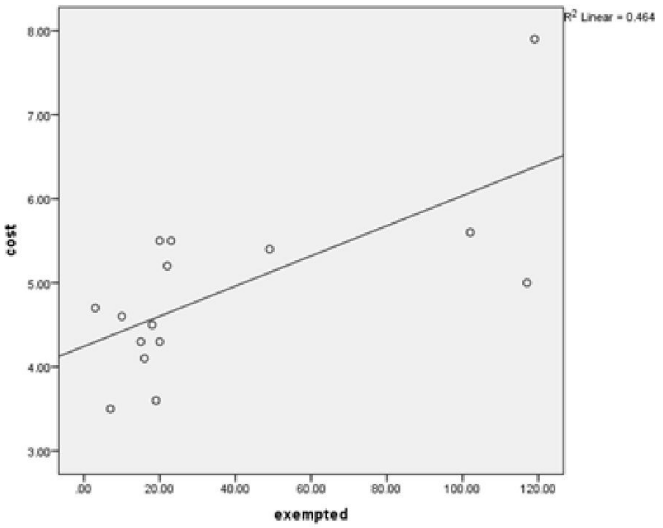
Drug use indicators	PHC Level	Mean	F	P-value
Key drugs availability	Level II	88.4	1.18	0.34
	Level III	81.6		
	Level IV	78.4		
Average cost of prescription	Level II	4.04	6.2	0.014*
	Level III	4.84		
	Level IV	5.84		
Percent of cost coverage by co-payment revenues	Level II	91%	2.98	0.143
	Level III	86.8%		
	Level IV	74.8%		

Economical indicators

The average drug cost of prescription per clinic was 4.9 NIS (1.4 US$). The maximum value shown in level IV is 5.8 NIS, while the minimum value reported in level II (4 NIS) (table 3) with statistically significant relationships were reported between PHC level and the average prescription cost where P value was (0.014). The average percent of co-payment coverage of the consumed drugs cost is 84%. Regarding the PHC level; the highest average percent of cost coverage was reported in level II (91%), followed by level III (86.8%), and (74.8%) in level IV but these differences in cost coverage were not statistically significant (table 3).

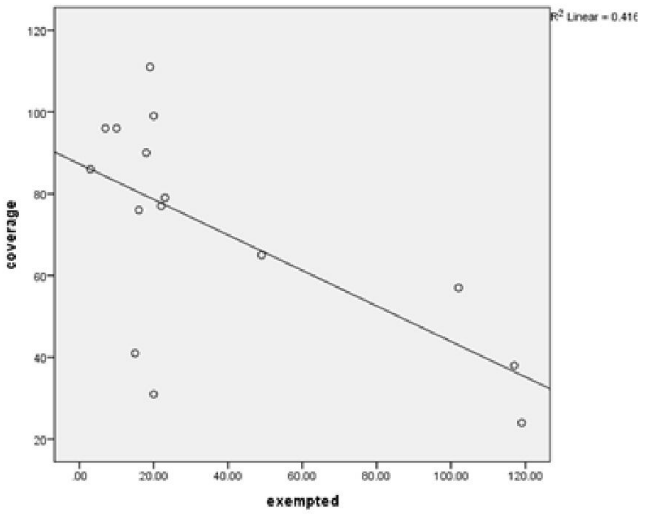
Exemption effects

Graph 1 shows statistically significant relationship between number of exempted patients and prescription cost, Correlation coefficient was 0.681 and P value = 0.005. Also there were negative relationship between the number of exempted patients and cost coverage, graph 1 demonstrates positive correlation between both (correlation coefficient = 0.645) and it was statistically significant with P value = 0.009.



Correlation coefficient = 0.68
P value = 0.005

Graph 1. Correlation between prescreptions cost and the number of exempted prescriptions



Correlation coefficient = -0.645
P value = 0.009

Graph 2. Correlation between cost coverage and number of exempted prescriptions

DISCUSSION

The average number of drug per prescription was higher than the standard values that are recommended by WHO "less than

two drugs" (WHO, 2006). The increase in co-payment value was inversely related to the number of drugs per prescription. Prescriptions of exempted patients have the highest number of drugs per prescription (4.5). The mean of drug number of non-exempted prescription was (2.1); and in reality this number is closer to reflect the real situation but still higher than WHO recommendations. The result of this study for non-exempted prescriptions is much better than the results which found in Indonesia (3.3) (Hogerzeil *et al*., 1993), but almost equal to the result in Tanzania (2.2), in Alexandria Egypt (2), and Dubai (2.2) (Hogerzeil *et al*., 1993, Zaki, *et al*., 1999, Sharif *et al*., 2007). On the other side of the spectrum, the results are higher than which was reported in Yemen (1.5), Sudan (1.9) and Lebanon (1.6) (Hogerzeil *et al*., 1993, Abdelmoneim *et al*., 2006, Hamadeh *et al*., 2001). The average of exempted prescriptions in this study is higher than all reported in comprised countries, which ensure the importance of co-payment in rational drug use to reduce multiple drug prescription (polypharmacy) that increases both the risk of drug-drug interactions and the incidence of adverse drug reactions, and it may also reduce compliance.

Similar to the findings of this study Reproductive health Library published review aimed to determine the effects of co-payment policies on drug use and found that direct co-payments reduced drug use and planned drug costs across the studies, and patients responded through drug discontinuation or by cost-sharing (WHO, 2013). The high number of drug per prescription in exempted patient's prescriptions could be attributed to the poor prescribing practices resulted from lack of training programs, inadequate consciousness and awareness about drug cost, weakness of the accountability systems including inadequate supervision and poor monitoring. The differences on the average number of drug per prescription across the different PHC levels can be attributed to the variations in the type of pharmaceutical services which are provided at these clinics, where more quantities and varieties of therapeutically drug classes are available as the clinic level is higher; which increases the chance to escalate the number of drug per prescription, beside referral of more serious cases to the higher level PHC centers and available of lab investigation, x-ray in higher level clinics push physicians to prescribe medications for newly diagnosed cases.

The percentage of prescription including antibiotics is too high more than double what WHO recommends (>30%) (WHO, 2006). In general, the results of this study are higher than other reported studies even in non-exempted prescriptions (56.6%) where it is higher than what is reported in Dubai (21%), Norway (48%), and Yemen (46%) (Sharif *et al*., 2007, Lindbaek, 1999, Hogerzeil *et al*., 1993). The results become closely similar to what is reported in Uganda (56%), and similar to what is reported in Sudan (65%) (Abdelmoneim *et al*., 2006). These results are higher than the previous study in Gaza Strip in 2000 where the prescriptions which included antibiotics in PHC clinic were (48%) (Obeidallah *et al*., 2000). The high percentage of prescribing antibiotics in Gaza could be related to the huge number of wounded persons during continuous political unrest situations. The percent of exempted prescriptions that included antibiotics in PHC clinic was 79.1%, which is higher than what is reported in the literature, indicating the importance of co-payment in rationalizing antibiotic consumption; which also shown in non-exempted prescriptions, where the percent is decreasing when the co-payment is increasing (66.3% for over 3 year and 47% for under 3 years). The overuse of antibiotics problem is not confined on exempted but it considers real prescribing problem in the Gaza Strip extent in all patients' ages and categories. The problem may return to lack of patients' awareness about adverse effects of antibiotics use, and physician non-compliance with therapeutic protocols as result to weakness of physician training program, outdated essential drug list, and shortage of the needed drugs. All these factors force physician to prescribe available alternative antibiotics resulting in emergence of resistance strain of bacterial pathogens. The highest mean of number of drugs per prescriptions, and percent of prescriptions included antibiotics for patients who pay co-payment showed in first 10 days of the month. The authors' observations in Gaza that exempted patients were not affected by the change in the schedules of drug prescription or quantity needed or drug availability, so introducing co-payment would change prescribing pattern.

The average percent of drug availability (82.8%) is lower than which is recommended by WHO references (100%) (WHO, 2006). The result is consistent with that reported in a study in Gaza strip (82.6%) in 2010 (Fattouh *et al*., 2010); despite the special political and economical situation in the Gaza Strip; drug availability is better than Ecuador (38%), Bangladesh (54%), Nigeria (62%) and Tanzania (72%) (Hogerzeil *et al*., 1993). Recent reports showed lower availability percentages. Cameron *et al*. (2009) studied medicine availability and affordability in 36 developing and middle-income countries and found that average public sector availability of generic medicines ranged from 29.4% to 54.4% across WHO regions and found it to be 38% and 64% in the public and private sectors, respectively. Authors suggested policy options such as promoting generic medicines and alternative financing mechanisms to increase drug availability. Drug shortage in Gaza PHC centers may be due to political siege which prevent regular passage of drug, uncommitted supplier due to raw material shortage or bad political situation, insufficient fund for needed quantity, and change in donor agenda. But services variation cross different PHC levels, don't cause radical change in drug availability. In this study the average cost of prescription is (USA $1.4) is lower than those reported in USA ($10) (Grant Thornton, 2007).

The large gap returns to the difference in cost sharing system, where in USA the patient have opportunity to choose the trade name for the same item which may be more expensive but in our study the patient is restricted to what is available in PHC clinics. Despite the equality in number of drugs per prescription (2.9) the results also lower than the cost reported in Nepal ($3.29) and India ($4.5) (Alam *et al* 2006, Gupta *et al*., 2005), but that is due to the involvement of hospitals in Nepal and Indian studies which usually dispensed more expensive drug than PHC. The cost is higher than Egypt ($0.7) (Egyptian MOH; 1997), as result of a low drug cost in Egypt and the dependence of the Egyptian MOH mainly on local industries which reduce the others logistic costs. The study also explains the effect of exempted patient in reducing the coverage cost which refers to increasing in cost of consumed drug due to more number of drugs per prescriptions is more than increasing of fixed co-payment revenue. Results reflect the necessarily to review the exemption system and

establish the appropriate restrictions to help in limitation drug exploitation from exempted patients. The study highlights the importance of co-payment in cost recovery. The revealed findings flags an opportunity to promote the financial sustainability of the Palestinian health system through copayment. Copayment constitutes a golden opportunity to recruit internal in-house resources, promote rational use of drugs and enhance prescribing practices.

Conclusion and recommendations

There are clear differences between exempted and non-exempted patients in drug utilization and prescribing pattern. Poly pharmacy is not a major problem in non-exempted prescriptions. Nevertheless, the poly pharmacy problem clearly demonstrated in exempted prescriptions, which is higher than any other studied value. Study results clearly demonstrate the need for considerable improvement in prescription practices for exempted patients. Improvement can be achieved by provision of training program to prescribers, and promoting compliance of physicians to the standard protocols, and sensitizing health personnel about drug cost. Community awareness about economical and health adverse effect of unnecessary drug use also is necessary. Moreover, the reform of exemption system is necessary to limit the random exemption license. Reform could include establishing of special committee with health and non-health community members responsible about determining the eligibility for exemption. Introducing co-payments may increase patient's responsibility toward dispensed drug. Flat prescription fee which covering all medicines in whatever quantities within one prescription lead to over prescription, therefore user charges should be mad per drug not per prescription, or pay fixed small co-payment for each three drug per prescription.

On other hand, the antibiotic prescribing was a clear problem in all the Gaza Strip among exempted and not exempted patients despite the worsening problem among exempted patients. Intervention to rectify over prescription of antibiotics through reinforcement of the knowledge of the adverse effect of different antibiotics, availability of relatively safer alternatives and continually updating the essential drug list is necessary to improve rational drug use. Bad signal revealed in this study presented in drug shortage, which should be available all the time (100% availability), so the managerial interventions such as sufficient governmental expenditure and good benefits from donors are necessary to overcome key drug shortage problems. Regarding the financial indicators, the percent of drug cost coverage by co-payment revenue is not bad for middle income country and responsible to the free treatment of huge number of patients exposed to political unrest violence.

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