

Appointment System in Specialty Clinics of Ma'an Governorate:
Impact on the Quality of Health Services
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**Appointment System In Specialty Clinics of Ma'an Governorate: Impact on the
Quality of Health Services**

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Dedication

To the Ministry of Health, represented by their Excellencies the Minister and the
Secretary General

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Summary

1- Introduction and Objectives:

Patients coming from all over the governorate of Ma'an to visit specialty clinics at Ma'an Comprehensive Health Center have been facing difficulties in getting the service. A pilot field study was conducted to identify the main reasons behind low quality of provided services at these clinics. Lack of well-organized patient flow in these specialty clinics was found to be detrimental.

The main objective of this study was to increase the satisfaction level of patients referred to the specialty clinics in Ma'an by applying an appointment system. Specific objectives aimed at reducing the proportion of patients not receiving the service from the first visit, waiting time and increasing encounter time with physicians.

2- Methodology:

A. **Study Design:** The quasi-experimental method was used with pretest and posttest carried out on subjects from intervention and control groups. Subjects were randomly selected but not randomly allocated to the intervention and control groups. Specialty clinics at Ma'an Comprehensive Health Center and at Ma'an Hospital were considered for the intervention and control group respectively. The intervention group consisted of internal medicine, surgery, orthopedic and ENT clinics, while the control group consisted of pediatrics, obstetrics & gynecology, and nephrology clinics. A six-week pretest study was conducted on each group, followed by a posttest study for an identical period. The posttest was done after introducing the intervention, namely the application of the appointment system for about 12 weeks. Waiting time for patients to see the physician and the encounter time with him/her was measured separately using precise chronometers. After filling the time observation sheets, patients were interviewed and asked questions about their levels of satisfaction regarding the provided health services by using a specifically designed questionnaire.

B. **Sampling Universe and Sample Size:** The study population consisted of all patients calling on specialty clinics from all over the Governorate of Ma'an. The sample size was calculated to be 200 patients for each group (intervention and control) in the pretest and 200 patients for each group in the posttest.

C. **Data Collection Techniques and Intervention:** Data was collected through observation by recording waiting and encounter time. In addition, an interview questionnaire was used to measure patient satisfaction. The core stone of the intervention was the establishment of a special Central Appointment Unit (CAU) at the Ma'an Health Center, which was staffed and supplied with telephone services. Two

liaison officers were allocated at each health center in the Governorate. Referred patients visited the liaison officer, who in turn phoned the CAU to immediately arrange for an appointment at the respective Ma'an specialty clinic. Special forms (registry books) were designed used to document the appointments at both the health center and the CAU levels.

Date and time of the appointment were recorded on referral forms, which were stamped by the seal of the relevant center. At the end of each working day the CAU staff produced a list with the names of patients referred to each clinic and handed it over to the relevant clinic nurse, who in turn posted it on the clinic door after preparing the files of the following day's patients. Upon departure from clinics, treating physicians and nurses directed patients to visit the CAU. The unit handed patients their appointment cards, which were specially prepared in various colors each to indicate a specific clinic. Patients were required to present their appointment cards on each visit. These cards listed the patient's name, the next appointment date and the seal of the unit.

D. Data Analysis: Once the research team and assistants completed collecting pretest and posttest data, it was entered into the computer using the SPSS program. Data was then analyzed by using the following:

- Descriptive statistics using simple frequencies and cross-tabulations.
- Comparison of means of groups using independent samples *t test* or its equivalent the Mann Whitney U for non-parametric analysis.
- Comparison of proportions using χ^2 .

3- **Results:** Health services at specialty clinics were improved after applying the appointment system. The percentage of patients attending clinics without being served on the first visit decreased from 11.5% to 2%, while patient satisfaction regarding the provided services was improved. This came as a result of reducing the average time spent waiting for service from 137 to 50 minutes; and increasing the average encounter time with physicians from 4.3 to 6.1 minutes. The results observed in the intervention group were not found in the control group, which confirms the role of the intervention in the change that had occurred. All results were backed up with the appropriate statistical tests.

4- **Discussion:** Data analysis results surpassed the set objectives. Results revealed a considerable increase in patient satisfaction with services. This came as a result of reducing the average waiting time by approximately two thirds, and increasing the average encounter time with the physician by about 42%. Furthermore, the proportion of patients attending clinics without being served on the first visit decreased. Multiple problems were encountered in implementing the appointment system. The concept was not well received by patients at the beginning of the implementation. The study coincided with maintenance works at the intervention site. Personal connections interfered with arrangement of appointments early during implementation. However, the

determination of the research team to adhere to the proposed methodology assisted in overcoming the problems.

5- **Recommendations:**

- Applying the Appointment System to all specialty clinics in Ma'an.
- Applying the System to other governorates sharing similar geographic and demographic nature.

1- Introduction

Thanks to God Almighty, peace and prayers be upon His Faithful Messenger

1.1 The Problem

Ma'an Governorate stretches over a large area. The responsibility for providing health services to this region, which comprises one third of the country's total area, is confined to the Ministry of Health. A steady increase in demand on health services, particularly specialized services, brought to light the complaints of patients about low quality health services and about the distress they had to suffer in enduring lengthy waiting periods before receiving specialty clinic services.

The Ma'an Comprehensive Health Center is the single center providing specialist services to all Governorate inhabitants; other health centers are located at a considerable distance. Eventually, the research team conducted a pilot field study for identifying the extent, reasons and possible solutions for patients' suffering. The team identified the reasons for low quality service, which were mainly represented in the absence of any service management system. The majority of patients called on specialty clinics without previous appointments or coordination, which in turn increased the number of waiting patients, who ended up by either receiving poor services or by leaving without receiving the service at all.

1.2 Objectives

Accordingly, the research team decided to examine the effectiveness of applying an appointment system to these clinics. The main objective of this study was to improve the quality of health services offered to patients, which would represent the collective outcome of realizing the following specific objectives:

- Reducing the number of patients calling on specialty clinics without receiving service on the first visit by 25%.
- Reducing the average patient waiting time by 25% from the current level.
- Increasing the average time that patients spend with physicians by 25% from the current level.

2- Methodology

2.1 Study Design

Throughout the phases of this project, the quasi-experimental technique was applied; pretest and posttest studies were conducted on intervention and control groups in the following manner:

Study Group \ Study Phase		Pretest		Post- test
Intervention Group (Surgery, ENT, Internal, Orthopedics)	X	O ₁	[R]	O ₃
Control Group (Obstetrics & gynecology, Pediatrics, Urology)		O ₂	[R]	O ₄

- O1** The pretest measures for the study group
- O2** The pretest measures for the control group
- O3** The posttest measures for the study group
- O4** The posttest measures for the control group
- X** Implementing the appointment system for the intervention group
- [R]** Choosing patients at random

A comparison was made between (**O₁ & O₃**), (**O₂ & O₄**) to see the effectiveness of the intervention X.

Internal medicine, orthopedic, ENT and surgery clinics at the Ma'an Comprehensive Health Center were selected to comprise the intervention group, while the pediatrics, nephrology and obstetrics & gynecology clinics at the Ma'an Governmental Hospital were selected to comprise the control group. A preliminary pilot study was carried out to observe the nature of work at these clinics, in order to understand the problem and specify the factors affecting it.

The duration of each phase of the study (pre and posttest) was about 6 weeks, while the intervention was designed only for 12 weeks because of the nature of the governorate research that is short term.

2.2 Variables

2.2.1 Dependent Variable

Patient satisfaction, measured by:

- 1- Level of patient satisfaction with waiting time in front of physician's office.
- 2- Level of patient satisfaction with time spent with physician (encounter time).
- 3- Level of patient satisfaction with physician's treatment.
- 4- Level of patient satisfaction with treatment of nursing staff.
- 5- Level of patient satisfaction with waiting rooms.

2.2.2 Independent Variables

- 1- Time patients spend waiting before seeing physician.
- 2- Time patients spend with physicians.
- 3- Receiving the service from the first visit.

Assessment of patient satisfaction adopted the following levels:

1	2	3	4	5
Completely Dissatisfied	Dissatisfied	Moderately Satisfied	Satisfied	Completely Satisfied

In addition to the above, some identification variables such as age, sex, and place of residence were included.

2.3 The Intervention (Appointments System)

2.3.1 Establishing the CAU

A **Central Appointment Unit** was established at Ma'an Comprehensive Health Center, which was provided with three employees and supplied with a separate telephone line to facilitate communication between the unit and all health centers in the Governorate.

CAU staff was trained in performing all duties assigned to them, namely:

- Receiving patients referred from the city of Ma'an, and arranging their appointments.
- Arranging appointments requested via telephone by liaison officers for patients referred to the intervention specialty clinics from all the health centers located outside the city of Ma'an.
- Handling the recording of patient names and appointments on special forms for each of the intervention specialty clinics (Annex 1).
- Producing lists with names of patients, whose clinic appointments coincided the following day, handing them over to nurses to be posted in front of the clinics on appointment days (Annex 2).
- While patients were leaving the physician office at intervention clinics, physicians and nurses directed them to the CAU, where they were handed their appointment cards. Appointment cards were designed specially for this purpose in different colors each indicating a specific clinic, patient name, date of next appointment and the CAU seal (Annex 3).

2.3.2 Assigning two liaison officers

Two liaison officers were assigned to each health center located outside the city of Ma'an. Liaison officers contacted the CAU for arranging appointments for patients referred by local physicians to the intervention clinics. They also recorded appointment times and dates on their agendas and on physicians' referral forms.

The control group, on the other hand, was left to operate as usual without any intervention by the research team and assistants.

Twelve weeks after the intervention, the posttest phase of the study was conducted on both study and control groups using the same technique as in the pretest phase. Accordingly, patient waiting time and the time spent by patients with the physician were measured. Furthermore, team assistants filled out study questionnaire by directly interviewing patients.

2.4- Sampling

2.4.1 Sampling Universe

The sampling universe consisted of the population of patients referred from all health centers in Ma'an Governorate to specialty clinics.

2.4.2 Sample Size

The sample size was calculated according to the following formula:

$$n = Z^2 (1-P) * P / d^2$$

n = sample size
P= anticipated prevalence
Z= confidence limit
d= precision level

To assure maximum variability the anticipated prevalence of patient satisfaction was set at 50%. Confidence limit was set at 95% with 1.96 standard deviations. Finally, the precision level was set at 7%. Thus the sample size was calculated at approximately 200 patients, selected for each of the pretest and posttest for the intervention group and the control group alike. Accordingly, a total of 800 patients were included in the study at different stages.

2.4.3 Sample Selection

Sample selection followed the systemic random sampling method, where; the first patient was selected at random from the first five patients calling on each clinic. Given the fact that approximately 1200 patients were expected during the six weeks of data collection period, every sixth patient was selected as far as needed, that is 200 patients for each phase for both the intervention and study groups.

2.5 Data Collection Techniques

Data was collected using the following techniques:

2.5.1 Direct Personal Interviews

Research team members and assistants directly interviewed patients, or their companions in the case of children, for filling out a questionnaire specially drawn up for the study. The questionnaire covered the various aspects of the study such as age, sex, place of residence and number of schooling years, in addition to whether the patient was calling on the clinic with or without a

referral, with or without an appointment, and whether the patient received service on the first visit.

The main questions looked at the level of patient satisfaction with time spent waiting for the service, the time spent with the physicians, with physicians and nurse treatment, and with waiting room (Annex 4).

A pilot study conducted by the research team on specialty clinics at the Ma'an Comprehensive Health Center indicated that 35% of patients calling on clinics were satisfied with the times they spent waiting and with physicians.

2.5.2 **Observation**

Research team members and assistants used chronometers to measure waiting time to see the physician and time spent with him/her. In order to measure waiting time to get the service, data collectors monitored patients' arrival at clinics and began timing when patients handed in their referral or appointment cards or when they registered their names with clinic nurses in case they did not have referral note, and stopped timing upon patients' entry to clinics. On the other hand, the time patients spent with physicians was measured beginning with the entry of patients to clinics up to their departure. These times were recorded on a time observation form shown hereunder:

Time Observation Form

Clinic	Patient number:	
	Hour	Minutes
Time of patient arrival at clinic		
Time of patient entry to see physician		
Time patient spent waiting		
Time of patient leaving physician		
Time patient spent with physician		

Time Observer Name and Signature

This form was attached to the questionnaire, which was filled out by the relevant data collector.

2.6 Data Collection Plan

The research team drew up a plan for the collection of data at the beginning of the project, which involved the assignment of tasks to project staff. The research team allocated data collectors to the clinics of the two intervention and control groups for collecting and reporting pretest and posttest data to the research team office. Research team members were directly and completely informed with developments facing assistants during data collection. The research team

supervised all the activities on daily basis. After receiving filled questionnaires and forms, the research team did classification, numbering and sorting for each clinic separately, and kept them in a special file. In addition, a code was set for each of the questions stated in the questionnaires. Upon completion of double-checking and auditing the whole process, data was entered using the SPSS statistical package for analysis.

2.7 Data analysis

After the collected pretest and posttest data was entered into the computer, data was analyzed using the SPSS statistical system using the following statistical procedures:

- Frequency distributions
- Independent samples *t test* to compare means for continuous variables.
- Non-parametric analysis- comparing proportions using χ^2 and comparing ranks for ordinary variables using 2-independent samples-Mann Whitney U test.

The p value of 0.05 was considered as a cutoff point to detect statistical significance by accepting the null hypothesis when p was more than 0.05 and rejecting it when p was equal to or less than 0.05. All results were interpreted taking into consideration 95% confidence level and a precision of 7%.

3-Results

3.1 Number of Participants

A careful plan was drawn for independent analysis of each variable and its related factors. Appropriate statistical tests were applied whenever possible. The overall number of patients who participated in the study was 812. Out of these, 402 patients comprised the intervention group (200 for the pretest and 202 for the posttest) and the remaining 410 comprised the control group (200 for the pretest and 210 for the posttest). Table 1 summarizes the number of participants in different clinics.

Table (1) Number of Patients From Intervention and Control Group Clinics Who Participated in Pretest and Posttest

Type of the Clinic	Phase	Pretest	Posttest	Total
<i>Specialty Clinics of The Intervention Group</i>	Internal Medicine	50	51	101
	General Surgery	50	50	100
	Orthopedics	50	50	100
	ENT	50	51	101
<i>Specialty Clinics of The Control Group</i>	Obs & Gyne	68	88	156
	Pediatrics	71	75	146
	Urology	61	47	108
Total		400	412	812

3.2 Age & Sex

Table 2 illustrates the age distribution of the sample according to sex. The highest percentage of patients was in the age group of less than 15 years, while the lowest percentage was in the age group of 60 years and above. The youngest patient was under one year of age and the oldest was 91 years of age. Males were less than females, being 39% males as opposed to 61% of females.

Table (2) Number of Patients Visiting Clinics: Age group distribution according to sex

Age Groups	Sex				Total	%
	Male	%	Female	%		
< 15	143	44.8	132	26.8	275	33.9
15-29	45	14.1	105	21.3	150	18.5
30-44	52	16.3	149	30.2	201	24.8
45-59	34	10.7	66	13.4	100	12.2
≥ 60	45	14.1	41	8.3	86	10.6
Total	319	100	493	100	812	100

3.3 Place of Residence

Comprising 44.6% (358 patients) of the total were from the city of Ma'an, and 449 patients (55.4%) came from the rural areas outside the city.

3.4 Receiving Service on First Visit

3.4.1 Intervention Group

Table 3 shows that the percentage of patients receiving service on their first visit in the pretest phase was 88.5% and increased to 97.5% in the posttest after application of the appointment system. The increase was statistically significant where p was 0.001 when applying χ^2 test.

Table (3) Intervention Group: Patients Receiving Service on the First Visit

Service Received on 1 st Visit	Study Phase			
	Pretest		Posttest	
	N	%	N	%
Yes	177	88.5	196	97.5
No	23	11.8	6	2.5
Total	200	100	202	100

3.4.2 Control Group

Table 4 shows that the percentage of patients receiving service on their first visit in the pretest phase was 91% and increased to 95.5% in the posttest without application of the appointment system. The increase was statistically insignificant where p= 0.054 when applying χ^2 test.

Table (4) Control Group: Patients Receiving Service on First Visit

Service Received on 1 st Visit	Study Phase			
	Pretest		Posttest	
	N	%	N	%
Yes	182	91	201	95.7
No	18	9	9	4.3
Total	200	100	210	100

The comparison of pretest results for control and intervention groups as they appear in tables (3&4) indicates that the percentage of patients receiving service on the first visit was 88.5% for the intervention group and 91% for the control group. The observed difference was not of statistical significance (p=0.42) stressing the similarities of the two groups regarding this variable at the pretest level.

3.5 Visits to Clinics With Appointments

3.5.1 Intervention Group

Table 5 shows that the percentage of patients calling on clinics with previously arranged appointments was 38.5% in the pretest and increased to 98% in the posttest after application of the appointment system. The increase was statistically significant where $p < 0.0005$ when applying χ^2 test.

Table (5) Intervention Group: Patients Visiting Clinics with Previously Arranged Appointments

Visits With Appointment	Study Phase			
	Pretest		Posttest	
	N	%	N	%
Yes	77	38.5	198	98
No	123	61.5	4	2
Total	200	100	202	100

3.5.2 Control Group

Table 6 shows that the percentage of patients calling on clinics with previously arranged appointments was 50% in the pretest and decreased to 44.3% in the posttest. The increase was statistically insignificant where $p = 0.247$ when applying χ^2 test.

Table (6) Control Group: Patients Visiting Clinics with Previously Arranged Appointments

Visits With Appointment	Study Phase			
	Pretest		Posttest	
	N	%	N	%
Yes	100	50	93	44.3
No	100	50	117	55.7
Total	200	100	210	100

Comparing pretest results of the control and intervention groups as they appear in Tables (5&6) indicates that the percentage of patients receiving service on the first visit was 38.5% for the intervention group and 50% for the control group. The observed difference in favor of control group was of statistical significance ($p=0.02$).

3.6 Patient Satisfaction With Waiting Room

3.6.1 Intervention Group

Table 7 shows patient satisfaction levels regarding the waiting room during the two phases of the study for the intervention group. After applying the appointment system, the percentage of patients who felt comfortable with the waiting room increased from 3.5% in the pretest phase to 17.3%. On the other extreme, the percentage of patients who felt uncomfortable with the waiting room was reduced from 77.5% to only about 43%. The observed differences were of statistical significance ($p < 0.0001$ - Mann Whitney U test) *.

Table (7) Intervention Group: Patient Satisfaction with Waiting Room

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Comfortable</i>	7	3.5	35	17.3
<i>Moderately Comfortable</i>	38	19	80	39.6
<i>Uncomfortable</i>	155	77.5	87	43.1
<i>Total</i>	200	100	202	100

3.6.2 Control Group

Table 8 shows patient satisfaction levels during the two phases of the study for the control group. The percentage of patients who felt comfortable with the waiting room increased slightly from 4.5% in the pretest phase to 5.2% and accordingly the reduction of those who felt uncomfortable with waiting room dropped slightly from 79% to 72.4%. The observed differences were of statistical insignificance ($p = 0.13$ - Mann Whitney U test).

Table (8) Control Group: Patient Satisfaction with Waiting Room

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Comfortable</i>	9	4.5	11	5.2
<i>Moderately Comfortable</i>	33	16.5	47	22.4
<i>Uncomfortable</i>	158	79	152	72.4
<i>Total</i>	200	100	210	100

The comparison of pretest results for both control and intervention groups, as shown in Tables 7&8, indicated no difference in patients' opinion about the waiting room (p

* Mann Whitney test is a non-parametric test equivalent to *t test* used for ordinal variables. For sake of consistency this test will be used for all satisfaction variables. Asking patients about levels of satisfaction is similar to asking them to assign a rank for their levels of satisfaction from the lowest (1) to the highest (5) or up to 3 for this question. The marginal weight given to each level of satisfaction is similar which might not be quite true.

= 0.73). This fact stresses similarities of the two groups regarding this variable at the pretest level.

3.7 Patient Satisfaction with Waiting Time

3.7.1 Intervention Group

Table 9 shows levels of satisfaction of patients about the waiting time to see their treating physician. The percentage of patients who were completely dissatisfied with waiting time dropped from 43% to 0%, while the percentage of completely satisfied rose from 1% to about 35%. The observed differences were of statistical significance ($p < 0.0001$ - Mann Whitney U test).

Table (9) Intervention Group: Patient Satisfaction with Waiting Time

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Completely Satisfied</i>	2	1	70	34.7
<i>Satisfied</i>	13	6.5	88	43.6
<i>Moderately Satisfied</i>	28	14	33	16.3
<i>Dissatisfied</i>	71	35.5	11	5.4
<i>Completely Dissatisfied</i>	86	43	0	0
<i>Total</i>	200	100	202	100

3.7.2 Control Group

Table 10 shows levels of satisfaction about waiting time in front of physician's office for the control group. The percentage of completely dissatisfied increased from 17.5% to 39.5%. The difference between the pretest and the posttest was statistically significant ($p < 0.0001$ - Mann Whitney U test). It is worth mentioning that the difference is in the opposite direction to that of the intervention group

Table (10) Control Group: Patient Satisfaction with Waiting Time

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Completely Satisfied</i>	9	4.5	0.0	0.0
<i>Satisfied</i>	35	17.5	25	11.9
<i>Moderately Satisfied</i>	56	28	36	17.1
<i>Dissatisfied</i>	65	32.5	66	31.4
<i>Completely Dissatisfied</i>	35	17.5	83	39.5
<i>Total</i>	200	100	210	100

The comparison of the satisfaction level for the intervention and control groups at the pretest level (Tables 9 & 10) indicates that the two groups were more dissimilar in this regard with higher levels of satisfaction in the control group ($p < 0.0001$ - Mann Whitney U test).

3.8 Patient Satisfaction with Treatment of Nursing Staff

3.8.1 Intervention Group

Table 11 indicates no difference in patient satisfaction levels in relation to nursing treatment. Such a result was expected since, aside from the decrease in patient number, no interventions were made to affect the way the nursing staff treats the patients ($p = 0.72$ - Mann Whitney U Test).

Table (11) Intervention Group: Patient Satisfaction with Treatment of Nursing Staff

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Completely Satisfied</i>	45	22.5	57	28.2
<i>Satisfied</i>	132	66	131	64.9
<i>Moderately Satisfied</i>	19	9.5	13	6.4
<i>Dissatisfied</i>	1	0.5	1	0.5
<i>Completely Dissatisfied</i>	3	1.5	0	0
<i>Total</i>	200	100	202	100

3.8.2 Control Group

Table 12 shows a lack of difference between patient satisfaction levels for treatment of nursing staff ($p = 0.761$ Mann Whitney U test). This result was similar to that of the intervention group.

Table (12) Control Group: Patient Satisfaction with Treatment of Nursing Staff

Level of Satisfaction	Study Phase			
	Pretest		Posttest	
	N	%	N	%
<i>Completely Satisfied</i>	9	4.5	4	1.9
<i>Satisfied</i>	163	81.5	180	85.7
<i>Moderately Satisfied</i>	24	12	16	7.6
<i>Dissatisfied</i>	3	1.5	6	2.9
<i>Completely Dissatisfied</i>	1	0.5	4	1.9
<i>Total</i>	200	100	210	100

As shown in tables 11&12, the difference between the pretest results for the satisfaction levels of the control and intervention groups in reference to treatment of nursing staff was statistically significant ($p < 0.0001$ Mann Whitney U test).

3.9 Patient satisfaction With Treatment of Physician

3.9.1 Intervention Group

Table 13 reveals clear differences in patient satisfaction levels in relation to treatment of physician, especially in reference to the first satisfaction level (fully satisfied), which increased from 37% to 51% ($p < 0.0001$ Mann Whitney U Test).

Table (13) Intervention Group: Patient Satisfaction with Treatment of Physicians

Level of Satisfaction	Type of study			
	Pretest		Posttest	
	N	%	N	%
Fully satisfied	74	37	103	51
Satisfied	99	49.5	95	47
Moderately satisfied	16	8	4	2
Not satisfied	9	4.5	0	0
Absolutely unsatisfied	2	1	0	0
Total	200	100	202	100

3.9.2 Control Group

Table 14 shows a clear decrease in the levels of patient satisfaction with physician's treatment between the pretest and posttest groups ($p = 0.0001$ Mann Whitney U test).

Table 14 Control Group: Patient Satisfaction with Treatment of Physicians

Level of satisfaction	Type of study			
	Pretest		Posttest	
	N	%	N	%
Fully satisfied	44	22	17	8.1
Satisfied	147	73.5	183	87.1
Moderately satisfied	7	3.5	5	2.4
Not satisfied	2	1	1	0.5
Absolutely unsatisfied	0	0	4	1.9
Total	200	100	210	100

Comparison of pretest results for the study and control group revealed a lack of a statistically significant difference in the degree of patient satisfaction with physicians' treatment ($p = 0.149$ Mann Whitney U test).

3.10 Patient Satisfaction with Time Spent with Physicians

3.10.1 Intervention Group

Comparison of pretest and posttest data results, shown in Table 15, indicates a noticeable increase in patient satisfaction regarding the time spent with physicians. The percentage of patients in the intervention group, absolutely unsatisfied with the time spent with the physician, decreased from 13.5% to nil. Likewise, the percentage of patients “not satisfied” with time spent with the physician decreased from 17% to 5%. ($p < 0.0001$ Mann Whitney U test).

Table 15 Intervention Group: Patient Satisfaction with Encounter Time with Physicians

Level of satisfaction	Type of study			
	Pretest		Posttest	
	N	%	N	%
Fully satisfied	12	6	105	52
Satisfied	68	34	83	41.8
Moderately satisfied	59	29.5	12	5.9
Not satisfied	34	17	2	5.1
Absolutely unsatisfied	27	13.5	0	0
Total	200	100	202	100

3.10.2 Control Group

The comparison of pretest and posttest data for the control group shown in Table 16 indicates a decrease in patient satisfaction regarding time spent with physician ($p < 0.0001$ Mann Whitney U test).

Table 16 Control Group: Patient Satisfaction with Time Spent with Physicians

Level of Patient satisfaction	Type of study			
	Pretest		Posttest	
	N	%	N	%
Fully satisfied	11	5.5	9	4.3
Satisfied	120	60	85	40.5
Moderately satisfied	36	18	53	25.2
Not satisfied	21	10.5	38	18.1
Absolutely unsatisfied	12	6	25	11.9
Total	200	100	210	100

Comparison of intervention and control pretest results, shown in tables 15&16, revealed a statistically significant difference in the levels of patient satisfaction concerning time spent with physician to the advantage of the control group.

3.11 Patient Waiting Time

3.11.1 Intervention Group:

Examining pretest and posttest data results in table 17 indicates a decrease in the average patient waiting time by about two thirds after instituting the Appointments System. Accordingly, the average patient waiting time dropped from 136.4 minutes in the pretest study to 49.9 minutes in the posttest study (t test, $p < 0.0001$).

Table (17) Intervention Group: Average of Patient Waiting Time

Type of study	N	Mean
Pretest	200	136.4 minutes
Posttest	202	49.9 minutes

When categorizing the waiting time spent by the patient, as illustrated in Table 18, it was found that the percentage of patients who waited for over 3 hours dropped from 23.5% to 0.5% ($p = 0.0001$ using χ^2).

Table (18) Intervention Group: Categories of average Patient Waiting Time

Waiting Time Categories in Minutes	Pretest		Posttest	
	N	%	N	%
60 and under	23	11.5	135	66.8
61-120	59	29.5	59	29.2
121-180	71	35.5	7	3.5
Over 180	47	23.5	1	0.5
Total	200	100	202	100

The expected amounts in all cells are >5

3.11.2 Control Group

Table 19 displays the comparison of pretest and posttest data results for the average waiting time spent by patients in the control group. A slight decrease of 10% value in the average waiting time was noted. The average waiting time decreased from 124.7 minutes in the pretest study to 112.3 minutes in the posttest study. Further statistical analysis revealed no significant difference (t test, $p = 0.71$).

Table (19) Control Group: Average of Patient Waiting Time

Type of study	N	Mean
Pretest	200	124.7
Posttest	210	112.3

Table 20 shows no significant change in the percentages of the categorized waiting time (χ^2 test, $p= 0.08$).

Table (20) Control Group: Categories of Average Patient Waiting Time

Waiting Time Categories in Minutes	Pretest		Pretest	
	N	%	N	%
60 and under	58	39	33	15.7
61-120	84	42	112	53.3
121-180	50	25	52	24.8
Over 180	8	4	13	6.2
Total	200	100	210	100

The expected amounts in all cells are >5

3.12 Time Patients Spend with Physicians in Clinics

3.12.1 Intervention Group

Table 21 compares pretest and posttest data results for the average time patients spent with physicians after the application of the Appointments System. With a 40% increase, the average time spent with the physician increased from 4.3 minutes in the pretest study to 6.1 minutes in the posttest study. Analysis indicated statistically significant differences in the average time spent with the physician (t test, $p<0.0001$).

Table (21) Intervention Group: Average Encounter Time with Physicians

Study type	N	Average Time in Minutes
Pretest	200	4.3
Posttest	202	6.1

Table 22 displays categories of encounter time detecting a clear drop in the percentage (from 20% to 2%) of patients spending less than 3 minutes with the physician ($p< 0.0001$ after applying χ^2).

Table (22) Intervention Group: Categories of Average Encounter Time with Physicians

Average Encounter Time in Minutes	Pretest		Posttest	
	N	%	N	%
Under 3	39	19.5	4	2
3-6	114	57	84	41.6
7-9	39	19.5	99	49
Over 9	8	4	15	7.4
Total	200	100	202	100

3.12.2 Control Group

The comparison of pretest and posttest data results appearing in table 23 indicates a slight decrease in the average time patients spent with physicians. The difference between the average of 5.7 minutes in the pretest study and 5.6 minutes in the posttest study proved statistically insignificant when applying χ^2 and t test (p= 0.91).

Table (23) Control Group: Average Encounter Time with Physicians

Study type	N	Average Time in Minutes
Pretest	200	5.7
Posttest	210	5.6

Table 24 indicates no significant differences in categories of average encounter time of patients with physicians in the control group (χ^2 test, p=0.08).

Table (24) Control Group: Categories of Average Encounter Time with Physicians

Average Encounter Time in Minutes	Pretest		Posttest	
	N	%	N	%
Under 3	5	2.5	15	7.1
3-6	118	59	138	65.7
7-9	52	26	40	19
Over 9	25	1.5	17	8.2
Total	200	100	210	100

4-Discussion

The intervention and control groups were selected from the Ma'an Comprehensive Health Center and the Ma'an Public Hospital respectively. Differences in the working environment between the two chosen settings were to the advantage of the control group in regards to: 1) invariable presence of specialists in their clinics; and 2) physical condition of waiting halls. These differences were detected after conducting an analysis of pretest study results. However, customary to a quasi-experimental design, the control and intervention groups were similar in nature for most of the variables at the pretest stage.

This study proved it possible for some Governorates to institute an Appointment System within the existing resources. Introducing an Appointment System can have a positive impact on improving the quality of health care services. Following are some of the positive changes that resulted from this study:

- The introduction of the Appointments System lead to the **reduction of the percentage of patients' visits** to specialty clinics without receiving service on the first visit from 11.5% to 2%.
- The average **patient waiting time was reduced** from 136.4 minutes to 49.9 minutes.
- **The average time spent by patients with physicians increased** from 4.3 minutes to 6.1 minutes.
- **The daily number of patients visiting each clinic was limited** to a maximum of 45.
- **The average patient satisfaction level regarding specialty services was raised.** Setting appointments for specialty clinics resulted in a decrease in crowdedness and in ending patient/staff disputes.

Several concerns pre-empted the study as to the possibility of applying the proposed Appointment System. Following are some of the main difficulties and concerns encountered during the study:

- **A concern that the patients and medical staff would not accept the idea of the project.** This study attempted to apply an appointment system for the first time both at the governorate and country levels. An appointment system was unusual to the patients since they were accustomed to visiting Ma'an Health Center directly without a referral from their local health center. Consequently, referrals to specialty clinics were issued from the general practitioner in Ma'an Health

Center directly to the desired specialty clinic. Such a process created major difficulties for the research team and assistants during the initial phase of the project.

- **The application of the Appointment System coincided** with starting maintenance work at Ma'an Comprehensive Health Center thus making it difficult to designate a separate room for appointments. As a result, the appointment office was combined with the registry office thus hampering effective performance of the appointment team. However, the persistent and strenuous efforts of the research team abridged all obstacles and assisted in achieving desirable outcomes.
- **Attempts for exploiting personal connections** to influence the Appointments Unit staff was attempted by medical staff in order to secure their relatives with appointments on earlier dates. Had it not been for the strict demands to overlook such practices the encountered results would not have been achieved.

Improvement in patient satisfaction levels; receiving services on the first visit; and encounter time in the intervention group was paralleled with insignificant differences among the pretest and posttest studies for the control group. This emphasizes that the positive outcomes were due to the intervention (Appointment System) and not due to external factors or chance.

The study showed that the time spent with the physician was low. Even though the average encounter time increased to 6 minutes following the intervention, this remains a low figure that needs to be studied further in order to increase it to a reasonable level.

5-Recommendations

- 5.1 Institute a uniform Appointment System Unit** in all the specialty clinics in Ma'an governorate, and supply that unit with the resources necessary for securing system operation.

- 5.2 Disseminate the study results** after obtaining the required approvals, by holding a workshop that would include representatives from all around the Kingdom in addition to publishing a related paper in a suitable journal.

- 5.3 Applying the System on a trial basis in other governorates**, particularly those similar to Ma'an Governorate in their geographic and demographic nature.

6-Annexes

Annex (1):	Appointment Form
Annex (2):	List of Patients
Annex (3):	Appointment Card
Annex (4):	The Questionnaire

Annex (3)

Appointment Card

<p style="text-align: center;">Ministry of Health The General Health Directorate of Ma'an Governorate The Application of the Appointments System Project In Cooperation with PHCI</p> <p style="text-align: center;">Clinic: Surgery</p> <p>Patient Name: F AAAA File No.: 6111 [health] Center Card No.: Health Insurance Card No.:</p>	<p style="text-align: center;">Our Best Wishes for a Speedy Recovery</p> <p>In order for you to receive the best health service, please:</p> <ol style="list-style-type: none"> 1. Observe appointment time and date when calling on clinic. 2. Bring this card with you on each visit to the clinic
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Side 1

Side 4

Visit No.	Date of visit	Time of visit	Physician remarks	Physician signature	Appointment Unit clerk signature
1 st	9/4	11:10			
2 nd	9/5	11:20			
					Appointment Unit (seal)

Side 2

Side 3

