



Appointments Delay and No-show Among Patients in Primary Health Care Centers, Riyadh, Saudi Arabia

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Abstract

Introduction: Missed appointment and late appointment has been a major problem for healthcare management. This study aims to describe the problem of missed appointments and late appointments in PHC. Patients who make an appointment at a clinic but do not keep it and do not notify clinic staff in a timely manner are referred to as “no-shows” When making an appointment, “no-show” can be an important risk predictor of patient dissatisfaction with their care and lower quality of care. Clinics of all types, sizes, and practices face the widespread problem of “no-shows,” and no-show rates are a significant concern for healthcare providers. In addition, “no-shows” negatively impact patient health and clinic workflow.

Objectives: To describe the frequency of late and missed appointments in general clinics in PHC. And to compare with national and international standards

Methods: Review of patient appointments, appointment no-shows, and delays in the primary health care center were reviewed. A description of such parameters related to appointments was analyzed.

Results: All 42592 patient appointments in PHC general clinics were reviewed over a duration of six months in 2023; out of which 30588 patients attended on time; 5234 patients were late for the appointment and 6770 patients did not attend for the appointments. An average monthly patient attendance of 70.1%; an average late attendance for the appointment was 12.9%, and an average non-attendance of 16.9% was recorded for these six-month reviews of records in the PHC center. April was the lowest of attending on time and highest of did not attend.

Conclusions: There is an average of patients attending on time in PHC of 70% average late attendance for the appointment was 12.9%; and an average non-attendance of 16.9%. April was the highest month of average late or non-attendance for appointments by patients in PHC. There is a need for qualitative and quantitative large-scale studies to identify causes for non-attendance and late attendance and plan for interventions for control of such major challenges to healthcare resources and to healthcare decision-makers.

Keywords: No-show; Delay; Appointments; PHC

Review of Literature

“No-show” rates were higher in clinics that provide health care to underserved populations [1]. Patients from underserved populations do not keep their appointments for a variety of reasons, including forgetting their appointments, having problems with transportation, language barriers, believing they canceled the appointment but did not, or not understanding the appointment.

Much research has been done to identify and analyze the characteristics that most accurately describe patients who choose not to attend their appointments. According to a study by [2]; the individuals most likely to miss healthcare appointments were patients from lower socioeconomic backgrounds; patients who had a history of frequent no-shows. Patients who did not have insurance or Medicaid; patients who lived far from clinics; patients who no longer had time to attend their appointments; patients who were younger adults; and patients who suffered from mental illness or alcohol use disorders. In addition, patients tended to miss their appointments most often on Mondays, compared with other days of the week.

The financial impact of high “no-show” rates is enormous in different countries. One study in the United States estimates that more than \$150 billion is lost each year due to missed primary care appointments [3]. The rate of missed healthcare appointments ranged from 10% to 50% globally, with an average rate of 27% in the United States [3]. Many healthcare organizations are currently working to reduce financial losses and improve health outcomes by reducing the rate of missed appointments through better patient engagement, improved communication in clinics, and the creation of more flexible scheduling systems while optimizing scheduling capacity and protecting revenue from losses as a result of missed appointments.

High rates of no-shows are among the greatest barriers to access to care for low-income populations with multiple health needs. Missed appointments negatively impact the effective use of healthcare providers’ time. The wait time for other patients who wanted to make an appointment but could not because the desired time slot was occupied by a patient who missed their appointment can be very long. “No-shows” increase health care costs contribute to poor chronic disease control and increase the likelihood of poorer health outcomes due to delayed diagnoses.

Reducing the rate of missed appointments in primary care and providing continuous quality care over time can improve clinical efficiency and utilization, thereby increasing continuity of care management and improving patient health outcomes [4]. Continuity of care for patients with chronic conditions is critical to reducing hospitalizations, decreasing mortality, and lowering health care costs.

Continuity of care is also key to early detection of worsening signs or symptoms before they reach acute levels. Adherence to health appointments is an important factor in successfully managing care for patients with chronic conditions and improving patients’ quality of life.

Patients’ failure to keep appointments can lead to significant complications, including treatment failures due to lack of interaction with health care services. This is especially true for patients with chronic diseases and conditions. It is helpful to understand the demographic characteristics associated with “no-shows,” such as age, ethnicity, and health insurance coverage. Identifying which patients are more likely to be “no-shows and why, is a critical starting point for bringing attention to the problem and taking action to reduce “no-shows” Specific interventions are the most effective methods for improving attendance at primary care appointments, reducing no-show” rates associated with quality primary care, and reducing health disparities.

According to Kaplan-Lewis and Percac-Lima in 2013 [1]; The clinical consequences of “no-shows” are particularly problematic in primary and community healthcare settings that serve medically underserved, underinsured, and uninsured populations. In these populations, “no-shows” may be correlated with poorer health outcomes compared with other populations. Kaplan-Lewis and Percac-Lima in 2013 [1] conducted their study at Major Health Care Facility. The researchers wanted to find out why patients missed their medical appointments. During the five-month study period, there were 5604 scheduled appointments. About 16.5% (N = 927) of patients did not keep their appointment. The main reasons for non-attendance were forgetfulness (N = 97) 35.5% and communication errors (N = 86) 31.5%.

Kheirkhah, Feng, Travis, Tavakoli-Tabasi, and Sharafkhaneh in 2016 [5] also conducted a retrospective cohort study using administrative databases in 10 large hospitals from 1997 to

2008 to determine the prevalence of “no-shows” The researchers examined several predictors, including gender, age, day of the week and month of the appointment, and the financial impact of missed appointments. The average “no-show” rate was 18.8% across the 10 clinics. Primary care saw the most visits from 1997 to 2008, and the total population was 185,945, with an average of 33,098 patients who did not keep their appointments. The no-show” rate was higher in women’s clinics ($p < 0.001$); geriatric clinics had lower “no-show” rates ($p < 0.001$). Also in the same study noticed. “No-show” rates were highest on Mondays (13.7%), then decreased on Tuesdays (11.6%); “no-show” rates increased slightly until Fridays (12.7%).

Kheirkhah., *et al.* I 2016 [5] also assessed the impact of the month on “no-show” rates and reported that January, February, and March had the highest “no-show” rates, averaging 17.7%. The “no-show” rate gradually declined until September, when it dropped dramatically to 19.2%. The economic impact of missed appointments was \$196 per patient in 2008, placing a significant financial burden on the healthcare system. In the same study, the research team showed that there was a significant difference in appointment adherence when a centralized telephone reminder was used ($p = 0.03$). The average “no-show” rate decreased from 16.3% to 15.2% before and after using the new phone system.

The impact of nonattendance and strategies to reduce nonattendance is huge. These high rates of medical department appointment nonattendance negatively impact screening and consistent chronic disease surveillance and lead to an increase in hospital admissions and emergency department visits (ED).

Hwang., *et al.* 2015; [4] conducted a study to examine the relationship between patients’ propensity to miss appointments to outpatient appointments and acute care utilization outcomes; and found that the “No-show” propensity factors (NSPF) included young adults, patients who were nonwhite, patients with language barriers, and patients with low socioeconomic status. Groups with high NSPF had a “no-show” rate of 31.8%, compared with groups with low NSPF and a “no-show” rate of 2.4%. The number of emergency department visits was 295% in the high NSPF group compared with the low NSPF group. In addition, hospitalizations

increased by approximately 168% in the high NSPF group compared with the low NSPF group [4].

Taber., *et al.* in 2017 [6] conducted research to determine the impact of patient nonattendance on medication nonadherence and treatment outcomes. They found that appointment non-adherence and medication non-adherence were highly correlated and posed a very high risk in terms of kidney graft loss (HR 4.18, 95% CI 0.97-2.01, $p < 0.0001$) [6].

Methods

The study was conducted in a major Primary Health Care Center in Riyadh, as a record review study for the appointments and attendance for appointments, also, whether didn’t attend or delayed. Frequency for each parameter and proportions were calculated, for the six months of the first half of the year 2023.

Monthly rates for patient appointments and records of non-attendance and delayed appointments were identified for each month. Attendance Rates for each month and Differences were identified and expressed using a graphical representation. The data were anonymous, and no patient’s data was uncovered.

Data was collected using an Excel sheet and then transferred to SPSS software. Descriptive statistics such as frequency, proportions, means, and standard deviations were calculated for each parameter of patient appointments such as the total number of appointments, number and proportions of late attendance, and numbers and proportion of non-attendance, same time comparing to different months of study duration.

Graphical representations for each parameter of patient appointment were made explaining the average and central tendency and dispersion of each parameter.

Results

From Table 1 there is an average of 70% of patients who attend on-time primary health care, also there is an average late for appointment of 12.9%. the average non-attendance of patients to their appointments was 16.9%.

		Statistic	Std. Error Lower	95% Confidence Interval	
				Upper	
Appointment	N	115	0	115	115
	Range	245			
	Minimum	201			
	Maximum	446			
	Sum	42592			
	Mean	370.37	3.94	362.86	377.83
	Std. Deviation	63.544	3.825	55.437	70.482
	Variance	4037.813	482.102	3073.297	4967.730
On time	N	115	0	115	115
	Range	291			
	Minimum	76			
	Maximum	367			
	Sum	30588			
	Mean	265.98	4.48	257.54	274.97
	Std. Deviation	70.680	4.122	61.890	78.572
	Variance	4995.719	578.048	3830.403	6173.557
Late	N	115	0	115	115
	Range	44			
	Minimum	22			
	Maximum	66			
	Sum	5234			
	Mean	45.51	.96	43.69	47.43
	Std. Deviation	10.616	.486	9.616	11.497
	Variance	112.691	10.239	92.460	132.175
DNA	N	115	0	115	115
	Range	62			
	Minimum	36			
	Maximum	98			
	Sum	6770			
	Mean	58.87	1.23	56.45	61.22
	Std. Deviation	13.785	.902	11.968	15.538
	Variance	190.027	24.876	143.238	241.437

On time%	N	115	0	115	115
	Range	45.06%			
	Minimum	37.23%			
	Maximum	82.29%			
	Sum	8061.54%			
	Mean	70.1003%	0.6878%	68.7844%	71.4622%
	Std. Deviation	10.77659%	0.67226%	9.29706%	11.98225%
	Variance	116.135	14.344	86.435	143.574
Late%	N	115	0	115	115
	Range	26.05%			
	Minimum	5.29%			
	Maximum	31.34%			
	Sum	1492.14%			
	Mean	12.9751%	0.3594%	12.2714%	13.7033%
	Std. Deviation	5.00118%	0.37359%	4.18133%	5.66530%
	Variance	25.012	3.692	17.484	32.096
DNA%	N	115	0	115	115
	Range	33.12%			
	Minimum	9.30%			
	Maximum	42.42%			
	Sum	1946.32%			
	Mean	16.9245%	0.4918%	15.9668%	17.8025%
	Std. Deviation	7.12612%	0.52925%	6.03078%	8.11577%
	Variance	50.782	7.512	36.370	65.866
Valid N (listwise)	N	115	0	115	115

Table 1: Frequency distribution, Means, and Standard deviation for appointment in PHCs.

	Month					
	"1 Jan	"2 Feb	"3 Mar	"4 Apr	"5 May	"6 Jun
	Mean	Mean	Mean	Mean	Mean	Mean
Appointment	396	394	356	229	392	388
on time	291	293	251	112	291	286
Late	49	40	45	50	45	46
DNA	56	62	59	67	56	56
Ontime%	73.43%	74.23%	67.81%	46.80%	74.09%	73.59%
Late%	12.28%	10.07%	13.78%	22.55%	11.53%	11.98%
DNA%	14.28%	15.70%	18.41%	30.65%	14.38%	14.43%

Table 2: Means for appointment parameters in PHCs.

From Table 2 there is a marked decrease in patients attending on time to 46.8% and marked increase in the proportion of patients attending late or non-attendance at all; 12% and 73% respectively.

Report								
Month		Appointment	on time	Late	DNA	On time%	Late%	DNA%
"1 Jan	Mean	396.26	291.48	48.52	56.26	73.4327%	12.2838%	14.2835%
	N	23	23	23	23	23	23	23
	Std. Deviation	23.195	28.954	11.931	13.298	4.11056%	3.04777%	3.69066%
	Sum	9114	6704	1116	1294	1688.95%	282.53%	328.52%
	Minimum	332	211	30	36	63.55%	7.67%	9.30%
	Maximum	446	367	66	87	82.29%	16.80%	23.49%
	Range	114	156	36	51	18.73%	9.12%	14.19%
	Median	399.00	293.00	46.00	57.00	73.9018%	12.5000%	13.5468%
"2 Feb	Mean	394.40	293.15	39.60	61.65	74.2259%	10.0716%	15.7026%
	N	20	20	20	20	20	20	20
	Std. Deviation	14.641	27.058	7.816	14.228	4.82251%	2.09344%	3.92947%
	Sum	7888	5863	792	1233	1484.52%	201.43%	314.05%
	Minimum	366	230	22	39	61.01%	5.29%	9.63%
	Maximum	433	345	55	98	81.97%	14.51%	25.99%
	Range	67	115	33	59	20.96%	9.22%	16.37%
	Median	391.00	296.50	40.50	59.50	74.7905%	10.1990%	15.2244%
"3 Mar	Mean	356.27	251.41	45.45	59.41	67.8101%	13.7828%	18.4072%
	N	22	22	22	22	22	22	22
	Std. Deviation	80.867	89.725	11.224	14.036	13.31839%	5.67023%	8.85042%
	Sum	7838	5531	1000	1307	1491.82%	303.22%	404.96%
	Minimum	206	88	30	36	41.31%	7.21%	9.30%
	Maximum	446	367	65	82	82.29%	25.00%	39.81%
	Range	240	279	35	46	40.97%	17.79%	30.50%
	Median	388.00	284.50	44.00	60.50	73.9018%	11.8766%	15.7005%
"4 Apr	Mean	229.45	112.18	49.82	67.45	46.8006%	22.5525%	30.6469%
	N	11	11	11	11	11	11	11
	Std. Deviation	57.485	62.887	8.931	13.118	10.27688%	5.79384%	7.59807%
	Sum	2524	1234	548	742	514.81%	248.08%	337.12%
	Minimum	201	76	33	52	37.23%	12.47%	12.97%
	Maximum	401	299	63	98	74.56%	31.34%	42.42%
	Range	200	223	30	46	37.33%	18.87%	29.46%
	Median	210.00	91.00	53.00	64.00	44.1748%	24.8826%	30.9179%

"5 May	Mean	392.04	290.61	45.09	56.35	74.0881%	11.5303%	14.3816%
	N	23	23	23	23	23	23	23
	Std. Deviation	16.151	21.062	10.072	13.832	3.60484%	2.65567%	3.51786%
	Sum	9017	6684	1037	1296	1704.03%	265.20%	330.78%
	Minimum	368	261	30	36	68.03%	7.62%	9.30%
	Maximum	435	345	65	81	79.68%	16.80%	20.72%
	Range	67	84	35	45	11.65%	9.17%	11.41%
	Median	389.00	286.00	44.00	55.00	74.1425%	11.2532%	13.9175%
"6 Jun	Mean	388.19	285.75	46.31	56.13	73.5883%	11.9805%	14.4312%
	N	16	16	16	16	16	16	16
	Std. Deviation	13.258	16.336	10.812	12.816	2.77503%	2.95429%	3.09194%
	Sum	6211	4572	741	898	1177.41%	191.69%	230.90%
	Minimum	368	261	30	36	68.06%	7.59%	9.30%
	Maximum	407	311	65	86	77.36%	16.80%	21.13%
	Range	39	50	35	50	9.30%	9.20%	11.83%
	Median	389.50	283.50	46.00	59.00	74.1425%	12.5000%	15.0714%
Total	Mean	370.37	265.98	45.51	58.87	70.1003%	12.9751%	16.9245%
	N	115	115	115	115	115	115	115
	Std. Deviation	63.544	70.680	10.616	13.785	10.77659%	5.00118%	7.12612%
	Sum	42592	30588	5234	6770	8061.54%	1492.14%	1946.32%
	Minimum	201	76	22	36	37.23%	5.29%	9.30%
	Maximum	446	367	66	98	82.29%	31.34%	42.42%
	Range	245	291	44	62	45.06%	26.05%	33.12%
	Median	389.00	286.00	44.00	58.00	73.9018%	11.2532%	15.2174%

Table 3: Measures of dispersion for appointment parameters in PHCs.

Table 3 shows the range of appointments each day to be from 201 to a maximum of 446; and a range for attending on time from a minimum of 76 to a maximum of 367.

While late attendance for appointments ranged from a minimum of daily 22 and a maximum of 66 each day; and non-attendance for appointments ranged from a minimum of 36 to a maximum of 98 patients occurred in one single day during the six month review of patients appointment attendance records.

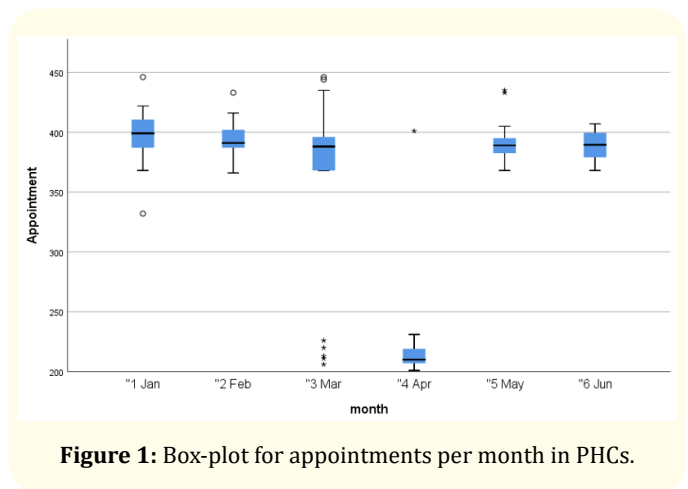


Figure 1: Box-plot for appointments per month in PHCs.

From figure 1 we can see clearly the depression for frequency of appointments in April compared to other months. The most variation was in march of same year.

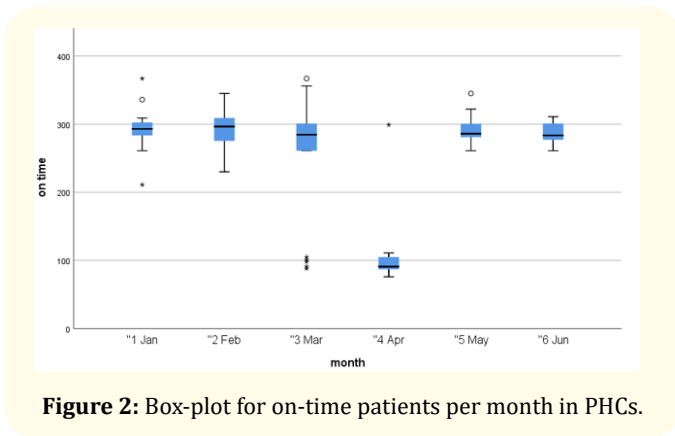


Figure 2: Box-plot for on-time patients per month in PHCs.

Figure 2 explains the frequency and variation of on-time patients and there is a variation in March and clear depression in April of the same year.

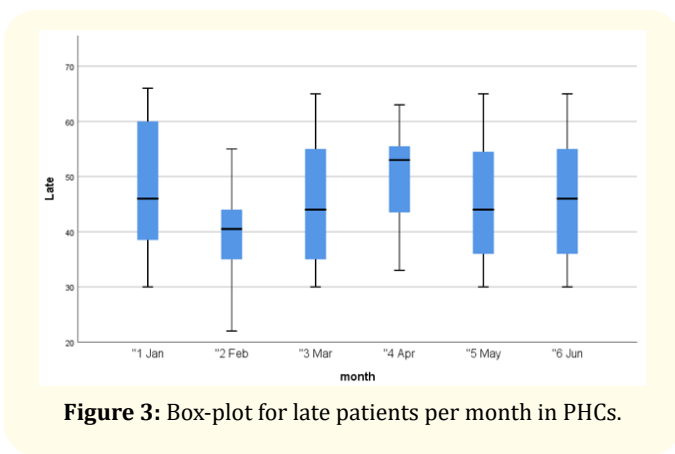


Figure 3: Box-plot for late patients per month in PHCs.

Figure 3 explains frequency for late patients to appointments averaged and median for each month of study duration.

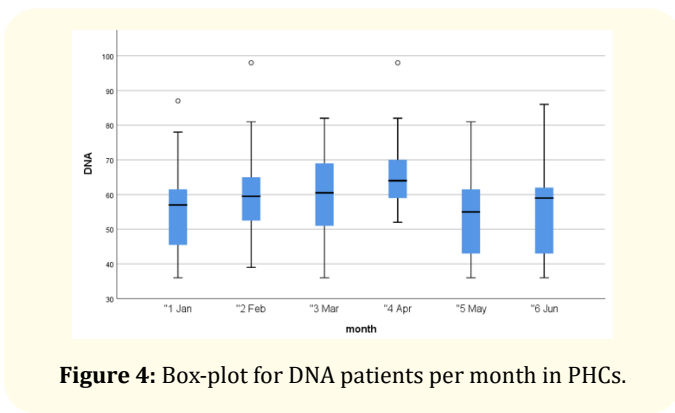


Figure 4: Box-plot for DNA patients per month in PHCs.

Figure 4 explains the number and average number of did not attend patients per month during the study duration.

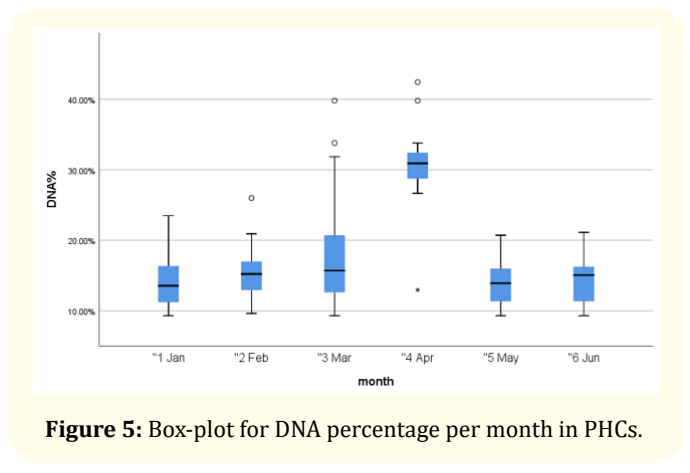


Figure 5: Box-plot for DNA percentage per month in PHCs.

Figure 5 explains the proportion of those who did not attend their appointments from appointments made for each month.

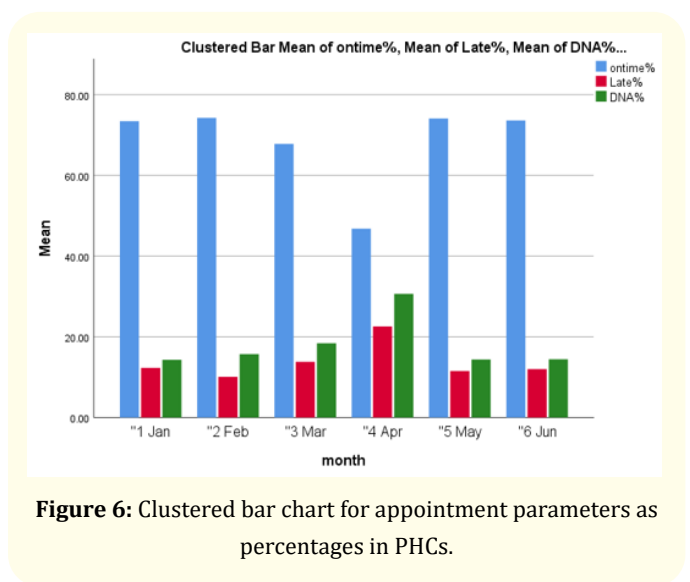


Figure 6: Clustered bar chart for appointment parameters as percentages in PHCs.

Figure 6 explains the proportions of those patients who attended on time for their appointments, also proportion of those who attended but late, and proportion for those who did not attend at all for their appointments.

Figure 7 explains the frequency of appointments per month, with related for each month frequency for attending on time, being late, or even not attending the appointments.

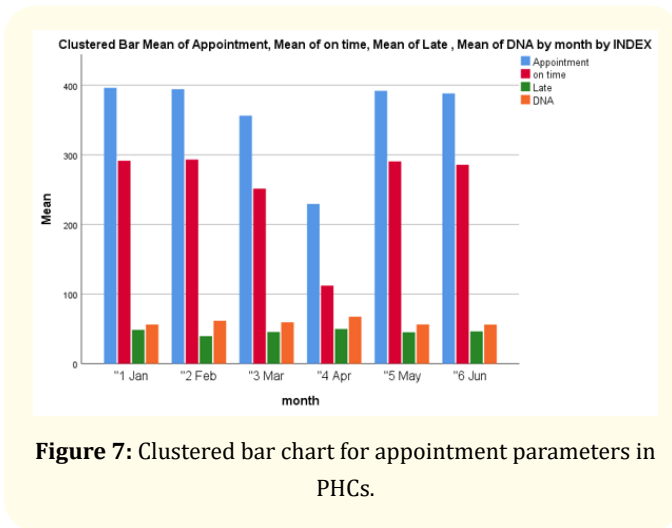


Figure 7: Clustered bar chart for appointment parameters in PHCs.

Discussion

Nonattendance or delayed attendance of patients for their appointments in general clinics or chronic disease clinics in primary health care is a major concern for healthcare professionals and healthcare decision-makers. Patients can be delayed or not attend their appointments for a variety of reasons.

The burden of delayed appointments or non-attendance in primary health care is huge (1,2) and all efforts should be combined to reduce these burdens as much as possible.

The average non-attendance on time is 16.9% in the table (1); Taber, *et al.* in 2017 (6) conducted research to determine the impact of patient nonattendance on medication nonadherence and treatment outcomes. They found that appointment non-adherence and medication non-adherence were highly correlated and posed a very high risk in terms of kidney graft loss (HR 4.18, 95% CI 0.97-2.01, $p < 0.0001$) (Taber, *et a.* 2017). This confirm that the consequences for non-attendance would be increased healthcare costs and a more burden in terms of DALYs and QALYs.

In Table 2 there is a marked decrease in attendance in the specific month which is April, compared to an average of 70% for the rest of the months of study duration, these might be due to external factors such as the month of fasting or there are school examinations, which are external factors to the health care system.

In Table 3, the largest variation was in the appointments requested and the least variation was in non-attendance. These variabilities in appointments or in not attendance greatly affect

resources allocated, disturb healthcare planning, and increase the burden on healthcare decision-makers.

Figures 1 to 7 graphically explain all study duration months all appointments, non-attendance, late attendance, and nonattendance, and explain the variability in these appointments' variables. Causes for such delays or non-attendance can be studied separately in our community, to plan for interventions and reduce the consequences of such events and the burden on the healthcare costs.

Conclusion and Recommendations

The average of attending on time for patient appointments in primary health care of 70% and average number of late attendances of 12.9% the average of late attendance for appointments in primary health care centers of 12.9% and the average of non-attendance of 16.9%. April was the highest in late attendance and patient non-attendance for appointments. It might be related to patients' other commitments for children's school examinations or crowded mobility during these months.

There is a need for qualitative and quantitative large-scale studies to identify causes for non-attendance and late attendance and plan for interventions for control of such major challenges to health care resources and to health care decision-makers.

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