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Effectiveness of tobacco smoking cessation clinics in improving tobacco smoking quit rates and lung function among adult males in Bahrain

Final Technical Report

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Executive summary

Background and objectives:

Cessation programs are essential to help smokers quit tobacco. Bahrain, in its efforts to control the tobacco smoking, established three quit tobacco clinics (QTC) since 2004. These clinics offer free of cost counseling and nicotine replacement therapy to tobacco smokers who wish to quit or have been referred to the clinic. The clinics have three trained physicians, two health educators and three nurses. Two clinics provide services once a week and the one twice. One third of Bahraini adult males and 7.0 % of females were current smokers of all types of tobacco in 2007 with significant proportions of current *shisha* smokers were males (males, 11%; females, 6.0%). Our study is one of the few studies that assessed tobacco control interventions in the Gulf Cooperation Council countries (GCC). It aimed to determine the effectiveness of QTC in Bahrain in helping tobacco smokers quit. We expected that the study findings would guide health policy makers in Bahrain as well as in the region to further improve their quit tobacco efforts.

Methods:

The study used a cross sectional design on a stratified random sample of 194 male tobacco smokers who had received care from two QTC (Hoora and Hamad Kanoo). Trained data collectors interviewed the study participants using a pre-structured Arabic (Annex 1) based or English (Annex 2) questionnaire on the language spoken by the QTC attendees. Participants' previous and current peek expiratory flow and carbon monoxide readings were recorded.

Main results:

The age of starting any type of tobacco smoking was 16.4±7.8 years, cigarette smoking 15.9±4.4 years and *shisha*, 19.6±7.4 years. The majority (97.0%) were cigarette smokers in our study. The average number of cigarettes smoked was 27 cigarettes per day for an average duration of 20 years. We found that 56.5% had quit all forms of tobacco after attending the QTC. S*hisha* smokers were more successful with quitting than the cigarette smokers. About 93.0% were given mostly a combination of nicotine replacement along with counseling sessions. A higher number of counseling sessions and visits to the clinics

increased the cigarette quitting. Most participants were satisfied with the clinics but the majority said that the opening hours and working days need to be increased.

Conclusions and recommendations:

The tobacco-quit rate (56.5%) among smokers seeking treatment QTC is encouraging and indicates that QTC are contributing to the tobacco control efforts in the country. The fact that most of the smokers went to the QTC because of their friends or wives was surprising as it is expected that more of them should have been referred by their physicians. We recommend that further efforts are needed by healthcare professionals, particularly physicians to inform smokers among their patients of the QTC. Quit tobacco interventions also need to be included in the healthcare professionals' training curricula. Ministry of health and tobacco program coordinators in Bahrain are encouraged to improve their monitoring and evaluation of the QTC services. Moreover, they need to consider increasing working hours and open days of the QTC. Further expansion of the QTC to other areas of the country will ensure wider accessibility to the clinics and can help reduce the burden of tobacco smoking in the country. Lastly, awareness raising efforts of the QTC should be expanded to include educational establishments, transport and media.

Background:

Bahrain ratified the World Health Organization's Framework Convention on Tobacco Control in 2007 and passed an antismoking law in 1994 with a modified one in 2009. Quit tobacco clinics (QTC) were established in three health centers in the Kingdom since 2004 to provide services to clients who wished to quit smoking. The first, Hoora was established in 2004 followed by Hamad Kanoo in 2012 and the clinic at Bank of Bahrain and Kuwait in 2014. Services are provided once a week in Hamad Kanoo and Bank of Bahrain and Kuwait clinics and twice a week in Hoora clinic. Three family physicians currently provide cessation treatment and advice in these clinics along with two health educators and three nurses. Although the services including consultation and nicotine replacement therapy (NRT) are given free of cost, the mean consultation cost, incurred on the Ministry of Health (MOH), for advice on smoking cessation in Bahrain is 4.5 BHD (12 USD) excluding the cost of NRT. In Bahrain, no efforts were made prior to our study to evaluate the effectiveness of these clinics in smoking cessation. The evaluation of the effectiveness of these clinics in tobacco control is essential to guide health policy makers in their tobacco control efforts; not only in Bahrain but also in countries of the Gulf Cooperation Council and the Eastern Mediterranean Region.

General Objective:

The general research objective of this study was to demonstrate the effectiveness of QTC among males in Bahrain.

Specific Objectives:

1. Determine the quit rates among males attending the Quit Tobacco Clinics.
2. Assess the participants' satisfaction with the smoking cessation treatment services
3. Determine the participants' smoking behavior prior to the consultation
4. Describe the sociodemographic determinants of smoking cessation in male adults
5. Identify the type and need for NRT received by the patients to quit smoking
6. Compare the current and past lung function of patients attending the clinic.

Investigators:

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Co-Investigators:

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2. Dr. Maha Al Kawari, QTC, MOH
3. Dr. Sharifa Bucheeri, QTC, MOH

Data Collectors:

1. Mrs. Madeeha AbdulAziz Salman AlSalloom (Nurse, QTC)
2. Mrs. Budoor Adel Khamis Zaman Khamis (Nurse, QTC)
3. Mrs. Rajaa Yusuf Hasan Ali Saleh (Nurse, QTC)
4. Mr. Husain Faisal Jasim Mohamed Alarayedh (Health Educator, QTC)
5. Mr. Mahmood Behzad (Fifth year medical student, AGU)

Methods:

A cross sectional study was conducted between 10 August 2015 and 30 December 2015. A sample size of 318 was to be selected based on a probability sample proportionate to size from the two clinics in Hoora and Hamad Kanoo Health centers. The Bank of Bahrain and Kuwait Clinic was excluded as it was established in May 2014. However to account for an expected non response rate of 10%, a sample of 354 was agreed upon. The sample was then stratified among the two health centers based on the proportion of patients attending the clinics in 2013 and 2014 i.e. 79% from Hoora (280) and 21% from Hamad Kanoo (74).

Data Collection:

The data was collected through a questionnaire in Arabic (Annex 1) or English (Annex 2) language which was pilot tested on 10% of clinic attendants who were not included in the study. The Arabic version was used for Arab speaking participants and the English for the others. Data collection started on 10 August 2015 and was completed on 30 December 2015. Data were also gathered for respiratory status of the quit tobacco participants in the study.

Peek expiratory flow readings were measured through Wright's mini Peek flow meter. The trained clinic staff members who were also the data collectors for our study obtained these readings on the patients. Participants were asked to take deep breath, close nose and wrap lips around the mouthpiece of the instrument to blow air with full strength. A separate mouthpiece was used for each participant. The readings have reference points with respect to gender, weight and height. The carbon monoxide levels (CO) in exhaled air were also measured, using a Micro CO meter, to assess the effect of cessation of tobacco smoking. Both the peek flow meter and CO levels are also routinely measured on each visit of the patient to the QTC. Initial readings for the first visit were obtained from the patient files if recorded.

Training of Data Collectors:

Data collection was undertaken by the paramedical staff working in the QTC at the MOH and one-fifth year AGU medical student. The former were already trained on performing respiratory peek flow and carbon monoxide breath tests but were further trained by Dr. Maha Al Kawari and Dr. Sharifa Bucheeri on using the data collection tool. Dr. Maha Al Kawari trained the student on performing respiratory peek flow and carbon monoxide breath tests and interviewing the patients.

Data analysis:

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive analysis was done to present frequencies and percentages of sociodemographic, smoking behavior and quit tobacco related variables. For our outcome variable we used chi square test or t-test in case of drawing inferences about categorical and continuous variables. For the comparison of various readings of lung function tests we applied paired t-test.

Ethical Considerations:

- Ethical approval was attained from the Research and Ethics Committee at CMMS, AGU (Annex 3) on 5 April 2015 and from the Research and Technical Support Team, MOH (Annex 4) on 15 June 2015.
- The questionnaire had no identity verification items for confidentiality.
- The consent forms in Arabic (Annex 5) and English (Annex 6) were signed by the study participants before the interviews and respiratory tests.

Results:

Data was available for 194 cases out of the original sample of 354. Table 1 shows the population, sample, data collected and refusals by the QTC. Overall our response rate was 54.8%, with a slightly higher percentage from Hoora Clinic (56.1%) than Hamad Kanoo Clinic (50.0%).

Table 1: Population, sample, data collected and refusals by QTC

QTC	2013	2014	Total patients (2013-2014)	Sample Size	Data Collected to date	Refusals
Hoora Health Center	166	304	470	280	157 (56.1%)	123 (43.9%)
Hamad Kanoo Health Center	70	84	154	74	37 (50.0%)	37 (50%)
TOTAL	236	388	624	354	194 (54.8%)	160 (45.2%)

1. Sociodemographic characteristics*:*

The majority of the study participants were Bahraini (80.6%) with a mean age of 37.2 years and with 42.5% having a secondary qualification (Table 2). Ninety-five only reported their average monthly income and the rest refused to give this information. The income was 781.1 $\pm$ 535 BHD, with large variation. Fifty five men had ever been unemployed at least with an average of 2±3.0 years duration (Table 2).

2. Source of information about the QTC:

Figure 1 shows the study participants' main source of information on the QTC was their friends (36.1%) followed by the primary healthcare establishment (25.1%), the physician (7.3%) or other (17.8%).

3. Referrals:

Most (96.9%) of the clinic patients were referred to the clinic. Friends, wives and doctors were the most referring persons (Figure 2). Twenty-five were referred to the clinics because of an illness, mainly Diabetes Mellitus (Figure 3).

Table 2: Sociodemographic characteristics of the patients attending the QTC

Characteristic	**Mean**	**±1SD**
Age of participant (n=191)	37.2	13.9
Total years of education (n=190)	12.7	3.3
Number of children (n=132)	3.5	1.7
Income (BHD) per month (n=95)	781.1	535.1
Number of clinic visits	2.7	2.0
Previous unemployment (years) (n=55)	2.0	3.0
Nationality (n=175)	**n**	**%**
Bahraini	141	80.6
Other Arab	21	12.0
Others	13	7.4
Educational level (n=193)		
Primary and below	17	8.8
Intermediate	22	11.4
Secondary	82	42.5
Graduate and above	72	37.3
Occupation (n=194)		
Low professional	20	10.3
Skilled	31	16.0
Semi-skilled	56	28.9
Unskilled	8	4.1
Unemployed	4	2.0
Retired	25	12.9
Student	31	16.0
Unspecified	19	9.8
Ever unemployed (n= 194)		
Yes	59	30.4
No	135	69.6

4. Quit rates among males attending the QTC

On average, the participants made 5.2±11.0 and 3.0±2.2 attempts to quit cigarettes (n=185) and *shisha* (n=41), respectively. Over half (56.5%) quit all forms of tobacco smoking after seeking services from the QTC. The highest quit rate was among cigar smokers (70.0%) followed by *shisha* smokers (63.8%), cigarettes smokers (55.1%) and pipe (16.7%) (Figure 4).

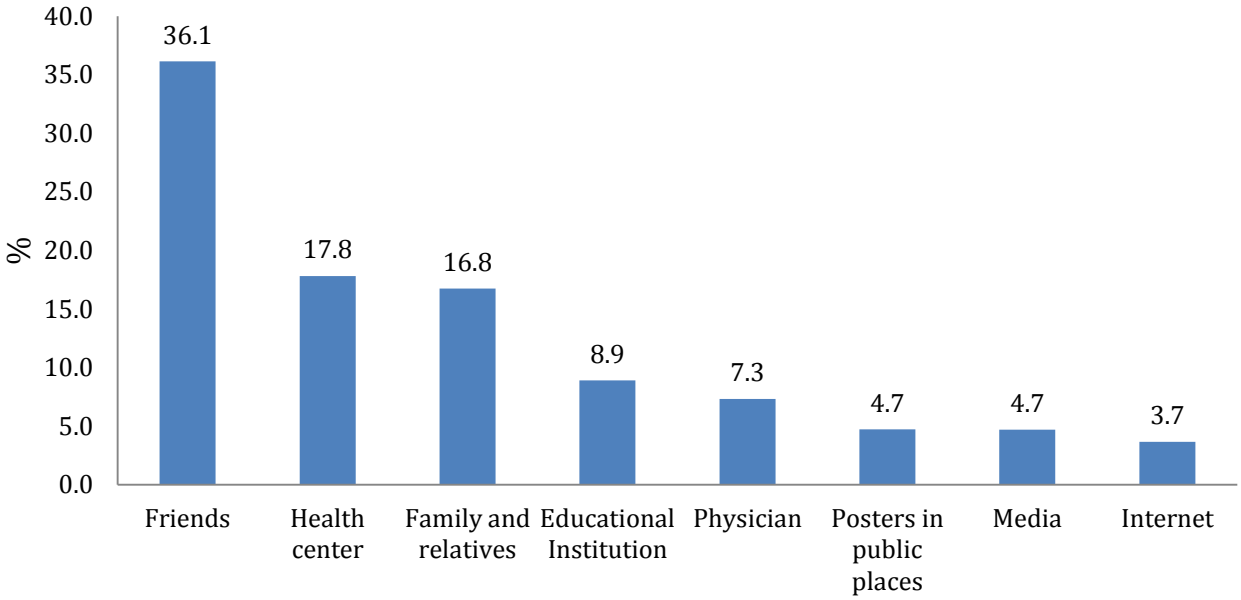


Figure 1: Sources of information about the QTC (n=193)

Health was the main reason to quit tobacco smoking in three quarters of the sample. However, habit and personal problems were identified by the participants as the main reasons for not quitting other products if they quit one form of tobacco of smoking. Family and friends supported most participants to quit tobacco smoking (Table 3).

Relapse in tobacco smoking was measured as resuming smoking after a participant had completely abstained from smoking for at least a month. Sixty-three participants (35.4%) experienced relapse in our sample and "personal problems" was the main reason for most participants for the failure to sustain a successful quit attempt. Withdrawal symptoms were only 10.0% of the reasons for the relapse, and headache and nervousness were the most common withdrawal symptoms experienced (Table 4).

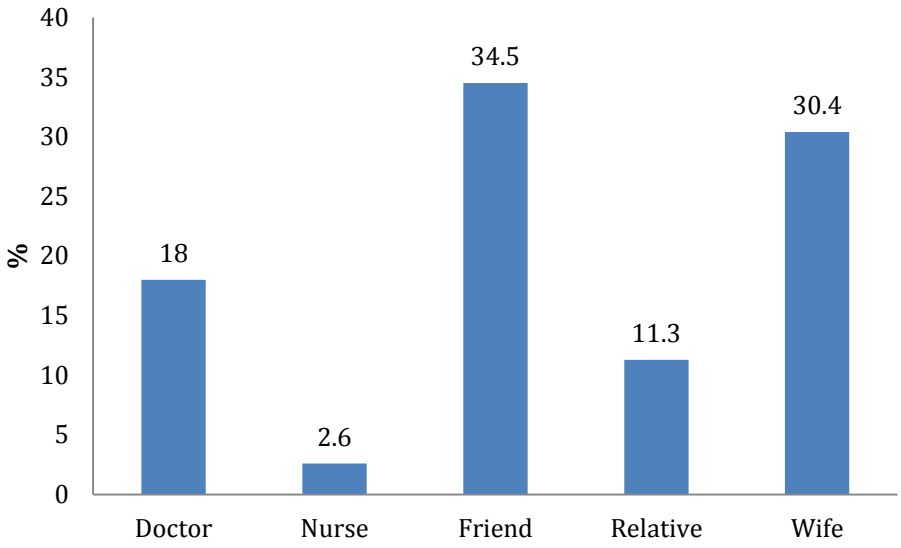


Figure 2: Persons referring the patients to the clinics (n=188)

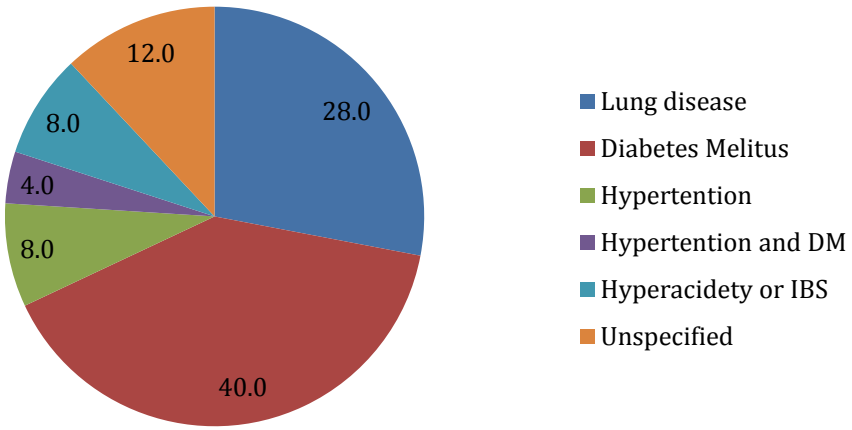


Figure 3: Referral of tobacco users to the QTC because of any illness (n=25)

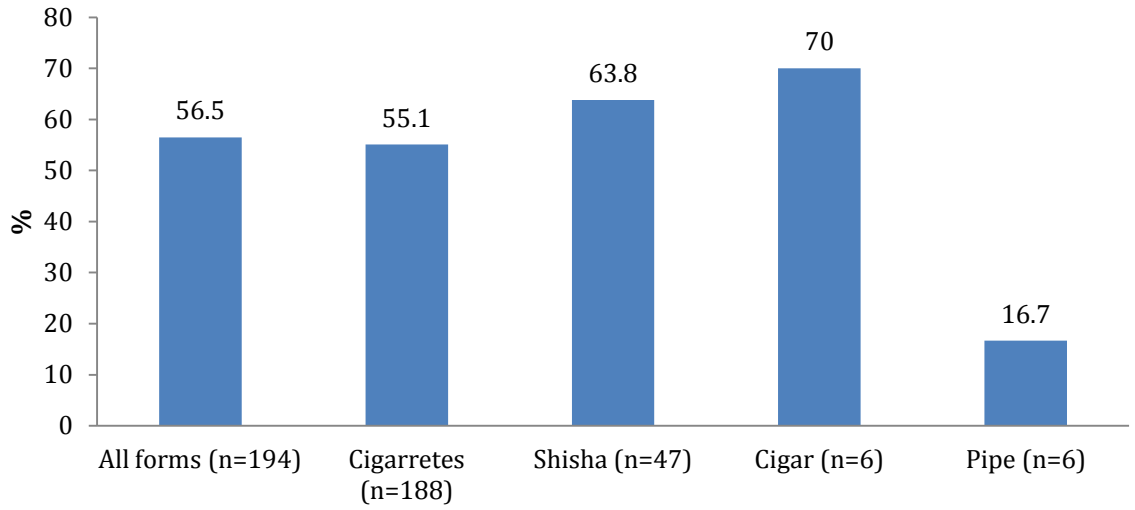


Figure 4: Tobacco quit rates at the QTC by type of tobacco smoking (n=194)

Table 3: Other characteristics of participants attending QTC

	No	%
Reason not able to quit other product(s) (n=111)		
Friends	13	11.7
Loneliness	6	5.4
Habit	30	27.0
Headache and tiredness	2	1.8
Enjoy smoking	13	11.7
Personal Problems	38	34.2
Nervousness	9	8.1
Most important reason for you to quit tobacco (n=191)		
Health	145	75.9
Economic	6	3.1
Family	30	15.7
Smell	2	1.0
Social/cultural	2	1.0
School	4	2.1
Sports	2	1.0
Most important support during the quitting (n=191)		
Family	110	57.6
Friend	11	5.8
Doctor	63	33.0
Coach	2	1.0
Self support	5	2.6

Table 4: Relapse after a successful quit attempt

	N	%
Relapse after quitting (n=178)		
No	115	64.6
Yes	63	35.4
Reason for the relapse (n=53)		
Personal Problems	29	54.7
Friends	8	15.1
Loneliness	6	11.3
Withdrawal symptoms	5	9.4
Travel	2	3.8
Habit	2	3.8
No support	1	1.9
Most common withdrawal symptoms (n=77)		
Nervousness	33	42.9
Headache and dizziness	31	40.3
Increased appetite	5	6.5
Cough	6	7.8
Weight gain	2	2.6

5. Participants' satisfaction with the smoking cessation treatment services

The overall satisfaction with the clinic was high (68.5%). 82.5% were completely satisfied with staff behavior and 73.2% with counseling sessions (Figure 5).

6. Participants' smoking behavior prior to consultation

There were 188 cigarette smokers (96.9%), with 72.2% who smoked cigarettes only and the rest with other products. Forty-seven smoked *shisha* (23.2%), of whom five (2.6%) smoked only *shisha* and 37 (19.1%) along with cigarettes and the remaining five along with cigarettes and other types (2.5%). Eight were cigar smokers (1 only cigar, 7 with other products), 6 were pipe smokers in addition to other products and 3 were cheroot smokers in addition to other products (Table 5). The age of starting any type of tobacco smoking was 16.4±7.8 years.

Figure 5: Client satisfaction with the QTC in Bahrain (n=194)

Table 5: Tobacco product usually smoked (n=194)

	n	**%**
Cigarette	140	72.2
Shisha	5	2.6
Cigar	1	0.5
Cigarette and *shisha*	37	19.1
Cigarette and cigar	1	0.5
Cigarette and pipe	3	1.5
Cigarette, cigar and cheroot	2	1.0
Cigarette, *shisha* and cigar	1	0.5
Cigarette, *shisha* and pipe	1	0.5
Cigarette, *shisha*, cigar and pipe	2	1.0
Cigarette, *shisha*, cigar and cheroot	1	0.5

Participants in our study started smoking cigarette at an average age of 15.9±4.4 years, smoked 27±16.9 cigarettes per day, total duration of smoking cigarettes was 19.8±12.8 years and they spent about 1.2 ±0.7 Bahraini Dinars (3.18±1.85 USD) on cigarettes per day. The most common reason to start smoking was a friend and most common brands smoked were LM and Marlboro. Although almost half smoked cigarettes after five minutes and within 1 hour but a significant 33.2% of the participants smoked their first cigarette within five

minutes of waking up in the morning. About 35% of the participants smoked cigarettes more in the morning than in the rest of the day and 38.6% said it was the first cigarette in the morning that they hated to give up (which indicates intense craving). About half even smoked cigarettes while they had some kind of illness and 38.0% said they are unable to refrain themselves from smoking in non smoking areas (Table 6).

Assessment of past *shisha* smoking behavior revealed that average age of starting was 19.7±7.4 years and they smoked *shisha* for the past 8.2±6.1 years and 3.4±4.5 times/ week; which cost them 3.1±3.3 Bahraini Dinars (8.21±8.74 USD) a week. In 61.0 % of the sample, the main reason or inspiration to start *shisha* smoking was friends. Most of them smoked *Fakher* and *Nakhla* brands, and grape, and apple flavors. Unlike cigarette smoking, the craving was not intense as most of the participants did not crave for *shisha* in the morning and smoke in the prohibited areas (Table 7).

Our inferential analysis to determine statistical significance of sociodemographic variables (mean age, total years of education, income and number of children) with quitting smoking were not statistically different among participants who had quit versus those who did not quit all forms of tobacco (Table 8). Similarly, the mean age when cigarette smoking was started, number of cigarettes smoked per day, cigarettes smoking quit attempts, duration and cost (BHD) per week were also not statistically significantly different in participants who had quit compared to those who did not quit all forms of tobacco (Table 9). For *shisha* smoking, total years, number of *shisha* smoked per week, quit attempts and cost were also not statistically significantly different among those who had quit and those who did not quit all forms of tobacco smoking (Table 10).

However, we found that those participants who had been ever been unemployed before, smoked cigarettes while they were even ill, were unable to quit other forms of tobacco because of friends or personal problems, said they would have received quit tobacco treatment if they had to pay for it and were completely overall satisfied with the QTC were more likely to quit all forms of tobacco for which the results were also statistically significant ($P < 0.05$) (Table 11).

Table 6: Cigarette Smoking behavior

	Mean	SD
Age started cigarette smoking in years (n=185)	15.9	4.4
Number of cigarettes/day (n=188)	27.0	16.9
Duration of cigarettes smoking in years (n=177)	19.8	12.8
Cigarette smoking cost (BHD) per day (n=187)	1.2	0.7
	No.	**%**
Reason to start cigarette smoking (n=188)		
Friend	88	46.8
Pleasure	15	8.0
Personal Problem	12	6.4
Imitation	18	9.6
Experimentation	55	29.3
Cigarette brand smoked (n=188)		
LM	62	33.0
Marlboro	60	32.0
Dunhill	13	6.9
Davidoff	17	9.0
Winston	12	6.4
Kent	8	4.3
Rothmans	6	3.2
hi-lite	4	2.1
Other	6	3.2
Time of first cigarette smoked in a typical day		
Within 5 minutes	62	33.2
Within 6-30 minutes	83	44.4
Within 31-60 minutes	29	15.5
After 60 minutes	13	7.0
Cigarettes smoking in morning more than rest of the day		
No	121	65.1
Yes	65	34.9
Cigarette most hate to give up		
First cigarette in the morning	73	38.6
Any other cigarette	116	61.4
Smoked cigarettes during illness		
No	94	50.8
Yes	91	49.2
Difficulty to refrain from cigarette smoking in forbidden places		
No	116	61.4
Yes	73	38.6

Table 7: *Shisha* smoking behavior

	Mean	**SD**
Age started *shisha* smoking (years) (n=47)	19.7	7.4
Duration of *shisha* smoking (years) (n=44)	8.2	6.1
Number of *shisha* smoked/week (n=47)	3.4	4.5
***Shisha* smoking cost (BHD) per week (n=46)**	3.1	3.3
	n	**%**
Reason to start shisha smoking (n=46)		
Friends	28	60.9
Change from other type of smoking	2	4.3
Personal problem	1	2.2
Fun	6	13.0
Staying awake	1	2.2
Imitation	2	4.3
Experimentation	6	13.0
***Shisha* brand (n=40)**		
Fakher	22	55.0
Nakhla	18	45.0
***Shisha* flavor (n=44)**		
Apple	13	29.5
Grape	22	50.0
Pomegranate	6	13.6
Mint	1	2.3
Strawberry	1	2.3
Watermelon	1	2.3
Time of first s*hisha* smoked in a typical day (n=47)		
Within 5 Minutes	1	2.1
After 60 Minutes	46	97.9
***Shisha* smoking in morning more than rest of the day**		
No	46	97.9
Yes	1	2.1
***Shisha* most hate to give up (n=42)**		
The first in the morning	0	0.0
Any other *shisha*	42	100.0
Smoke *shisha* during illness (n=47)		
No	43	91.5
Yes	4	8.5
Difficulty avoiding s*hisha* smoking in prohibited areas (n=47)		
No	45	95.7
Yes	2	4.3

7. Sociodemographic determinants of smoking cessation in male adults

Table 8: Quit versus did not quit across Sociodempgraphic variables

	Quit tobacco	n	Mean	SD	Mean Dif.	95% CI		P value
						Upper	Lower	
Age	Yes	108	37.5	13.9	0.7	-3.28	4.77	0.716
	No	83	36.7	13.9		-3.28	4.77	
Years of education	Yes	106	12.6	3.4	-0.0	-1.04	0.87	0.861
	No	84	12.7	3.0		-1.02	0.85	
Income	Yes	61	771.1	459.5	-28.0	-256.56	200.55	0.808
	No	34	799.1	656.5		-283.02	227.01	
Number of children	Yes	76	3.5	1.7	0.0	-0.60	0.61	0.988
	No	56	3.5	1.6		-0.60	0.61	

8. Type and need for NRT received by the patients to quit smoking

A total of 181 received NRT, mostly (79%) nicotine chewing gums and patches combined, though only 3.6% were given either Bupropion or Champix (Figure 6). One person was using traditional herbal treatment quitting tobacco. Only 11.7% stated purchasing NRT from a private pharmacy while the remaining received all their NRT free of cost from the QTC. For those who purchased NRT out of pocket the cost was unaffordable for 7.2%. when asked if they had to buy NRT out of pocket, if not covered by the clinic, 51.5% said that they would. Table 12 shows that the mean QTC visit frequency, counseling sessions, maximum abstinence from tobacco (months) and quitting duration (months) and number of quit attempts was higher among those who quit all forms of tobacco (P <0.05).

Table 9: Quit versus did not quit across cigarette smoking

	Quit tobacco	n	Mean	SD	Mean Dif	95% CI		P Value
						Lower	Upper	
Age cigarette smoking started	Yes	103	16.3	4.8	1.0	-0.32	2.24	0.139
	No	82	15.3	3.7		-0.28	2.20	
Number of cigarettes/day	Yes	105	25.9	16.8	-2.5	-7.40	2.40	0.316
	No	83	28.4	17.1		-7.41	2.42	
Cigarettes smoking quit attempts	Yes	103	6.6	14.5	3.1	-0.14	6.26	0.061
	No	82	3.5	2.5		0.18	5.95	
Cigarettes smoking duration	Yes	102	19.5	13.1	-0.79	-4.66	3.07	0.686
	No	75	20.3	12.5		-4.63	3.04	
Cigarette smoking cost (BHD) per week	Yes	105	1.2	0.7	-0.1	-0.27	0.15	0.572
	No	82	1.2	0.75		-0.27	0.15	

Table 10: Quit versus did not quit across *shisha* smoking

	Quit tobacco	N	Mean	SD	Mean Dif.	95% C.I.		P Value
						Lower	Upper	
Shisha smoking total years	Yes	31	7.8	5.7	-1.4	-5.54	2.72	0.495
	No	13	9.3	7.3		-6.16	3.34	
Number of *shisha*/week	Yes	32	3.7	4.9	0.9	-1.95	3.70	0.537
	No	15	2.8	3.3		-1.59	3.33	
Shisha smoking quit attempts	Yes	27	3.0	2.6	-0.2	-1.69	1.33	0.811
	No	14	3.1	1.2		-1.40	1.04	
Shisha smoking cost	Yes	31	3.3	3.4	0.6	-1.56	2.66	0.600
	No	15	2.8	3.3		-1.57	2.68	

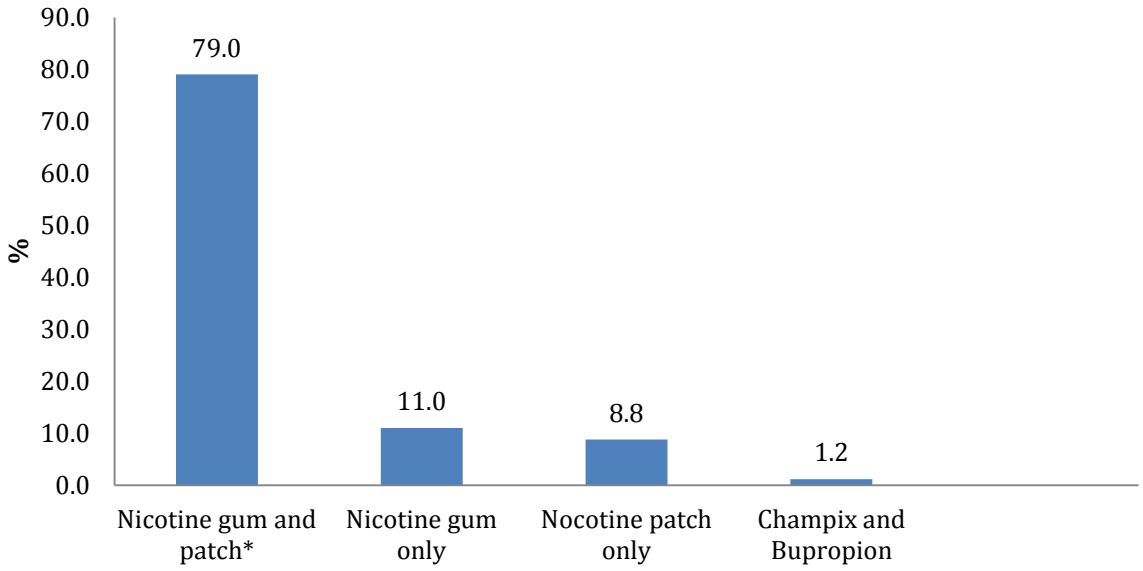
Table 11: Quitting all forms of tobacco by selected variables

		Quit all forms of Tobacco	
		Yes n (%)	No n(%)
Ever unemployed*	Yes	27(45.8)	32 (54.2)
	No	83 (61.5)	52(38.5)
Smoke cigarettes while ill*	Yes	60 (63.8)	34 (36.2)
	No	45 (49.5)	46 (50.5)
Reason not able to quit other product (s)*	Friends	8 (61.5)	5 (38.5)
	Alone	2 (33.3)	4 (66.7)
	Habituation	6 (20.0)	24 (80.0)
	Headache and tired	0	2 (100.0)
	Enjoy smoking	1 (7.7)	12 (92.3)
	Personal Problems	15 (39.5)	23 (60.5)
	Nervousness	4 (44.4)	5 (56.6)
Had received treatment if had to pay*	Yes	64 (64.0)	36 (36.0)
	No	46 (48.9)	48 (51.1)
Overall satisfaction with the clinics*	Not satisfied	3 (60.0)	2 (40.0)
	Slightly satisfied	1 (25.0)	3 (75.0)
	Satisfied	11 (39.3)	17 (60.7)
	Very satisfied	10 (41.7)	14 (58.3)
	Completely satisfied	85 (63.9)	48 (36.1

* P<0.05

9. Current and past lung function of patients attending the clinic

In Table 13, PFR and CO are compared for initial and last visits of the participants through paired t-test. The initial visit data was obtained from the files and the test 3, 2 were obtained during files and the test 3, 2 were obtained during follow up visits while the current readings were obtained along with the data collection for our study. The mean PFR was higher at second follow up visit as compared to test at initial, baseline, visit; which shows improvement in lung function following treatment at the QTC.



**Six persons were also given medications; either Bupropion or Champix*

Figure 6: Type of nicotine replacement treatment (n=181)

Table 12: Quitting all types of tobacco versus not quitting against the NRT

	Quit Tobacco	N	Mean	SD	Mean Dif	95% CI		P value
						Lower	Upper	
Nicotine gum duration (days)	Yes	34	44.2	67.8	17.6	-26.40	61.72	0.423
	No	11	26.6	43.4		-18.26	53.58	
Nicotine patch duration (days)	Yes	29	30.4	27.7	4.3	-17.52	26.28	0.688
	No	13	26.0	41.5		-22.24	30.99	
Champix treatment duration (days)	Yes	110	97.2	13.3	2.5	-2.14	7.25	0.284
	No	84	94.6	19.8		-2.40	7.51	
Traditional herbal medicine duration (days)	Yes	110	99.0	0.0	2.3	-0.50	5.21	0.105
	No	84	96.6	15.2		-0.94	5.65	
Clinic visit frequency	Yes	81	3.3	2.2	1	0.35	1.82	0.004
	No	56	2.2	2.1		0.35	1.82	
Counseling/advice sessions	Yes	104	3.3	2.1	1.4	0.89	1.98	0.000
	No	79	1.9	1.5		0.91	1.96	
Maximum abstinence from tobacco (months)	Yes	105	18.2	30.4	9.3	-1.6	20.28	0.095
	No	37	8.8	24.4		-0.63	19.26	
Quitting duration (months)	Yes	77	21.5	25.6	-17.1	-33.36	-0.93	0.038
	No	18	38.4	48.6		-1257.41	228.63	
Number of quit attempts	Yes	106	6.2	13.8	2.9	-0.11	6.09	0.059
	No	78	3.2	2.2		0.29	5.68	

Table 13: Comparison of Peak flow rates of participants

		N	Mean	SD	Mean Dif	SD of Dif.	95% CI of Dif		P value
							Lower	Upper	
Pair 1	PFR value initial visit	23	501.7	85.2	-48.7	62.2	-75.61	-21.78	0.001
	PFR test-2	23	550.4	67.8					
Pair 2	PFR value initial visit PFR test-3	72	501.7	82.9	-15.2	80.5	-34.11	3.70	0.113
		72	516.9	91.5					
Pair 3	PFR value initial visit	37	492.7	95.2	-10.9	82.8	-38.54	16.65	0.426
	PFR test current	37	503.6	111.9					

Similarly, table 14 shows a comparison of CO levels which were lower in all follow-up visits and current readings as compared to test done on initial, baseline, visits compared to the initial visits and results are statistically significantly different among the participants (P=<0.05).

Table 14: Comparison of Carbon Monoxide levels of participants

		n	Mean (PPM)	SD	Mean Dif	SD of Dif.	95% CI of Dif		P value
							Lower	Upper	
Pair 3	CO level initial	44	22.8	15.0	17.8	15.9	12.97	22.62	<0.001
	CO level-2	44	5.0	5.0					
Pair 1	CO level initial	120	19.1	13.8	3.3	17.0	0.22	6.37	0.036
	CO-3	120	15.8	13.8					
Pair 2	CO level initial	70	21.7	15.7	13.1	15.3	9.41	16.73	<0.001
	CO level current	70	8.6	8.8					

(Normal CO levels=<4ppm)

The successful quitters as compared to non-quitters of all forms of tobacco had better respiratory function as shown by their higher peak flow meter readings at the time of data collection (P=0.009). Similarly non-quitters had higher levels of CO both currently and at second follow up visit at the clinic (P=<0.000).

Discussion:

Cigarette smoking was the commonest form of tobacco smoked (96.9%) with the highest percentage of smoking it alone without other types (72.2%). The lower prevalence of *shisha* smokers attending the QTC can be partly attributed to the fact that *shisha* smoking may not be considered as addictive and harmful as cigarettes by the Bahraini community; which

warrants further efforts. Age started cigarette smoking (15.9 ± 4.3 years) was lower than that of *shisha* (19.7 ± 7.4 years).

Table 15: Peak Flow Meter and Exhaled Carbon Monoxide readings in quitters vs non quitters of all forms of tobacco

Readings	**Quit Tobacco**	**N**	**Mean**	**SD**	**Mean Dif**	**95% CI**		**P value**
						Upper	**Lower**	
PFR value initial (n=91)	Yes	50	506.2	81.3	2.5	-33.29	38.37	0.888
	No	41	503.7	90.5		-33.72	38.80	
PFR 2 (n=51)	Yes	35	519.0	91.7	22.7	-41.12	86.62	0.478
	No	16	496.3	130.9		-52.38	97.88	
PFR 3 (n=31)	Yes	24	532.9	83.4	-39.9	-110.44	30.56	0.256
	No	7	572.9	66.5		-106.09	26.21	
PFR current(n=167)	Yes	95	521.9	100.9	38.5	9.83	67.30	0.009
	No	72	483.3	81.6		10.65	66.47	
Carbon monoxide (PPM) **initial (n=142)**	Yes	75	18.0	13.8	-1.6	-6.11	2.86	0.475
	No	67	19.6	13.0		-6.09	2.84	
Carbon monoxide (PPM)-**3(n=49)**	Yes	35	4.3	2.0	-2.4	-5.39	0.59	0.113
	No	14	6.7	8.3		-7.24	2.44	
Carbon monoxide (PPM) **2 (n=80)**	Yes	56	7.4	8.1	-9.8	-14.82	-4.83	<0.000
	No	24	17.3	14.0		-16.11	-3.54	
Carbon monoxide (PPM)-**current (n=168)**	Yes	95	10.1	13.9	-13.0	-16.98	-9.06	<0.000
	No	73	23.1	11.4		-16.88	-9.16	

Duration of the former was longer (19.8± 12.8 years) than the latter (8.2± 6.1 years). It was not surprising that Marlboro was among the commonest brands smoked; however, LM being as common as Marlboro was not expected. Over three quarters of the cigarette smokers smoked their first cigarette within the first half hour after waking up, which reflects that they were addicted to cigarette smoking.

The majority of the smokers knew about the QTC from their friends. It was friends and wives who mostly referred them to the clinics. This finding emphasizes the role of friends and peers not only in smoking uptake but also in smoking cessation. Further, the fact that wives asked their husbands to attend the clinic implies that they were worried about the health of their husbands and other members of the family being exposed to second hand smoke.

The tobacco-quit rate (56.5%) that resulted from their attendance to the clinic is encouraging indicating that the QTC are contributing to the tobacco control efforts in the country. It is

also worth noting that almost two thirds had no relapse after quitting. The higher quit rates among *shisha* smokers (63.8%) than cigarette smokers (55.1%) most likely suggest that quitting might be easier by the former group. However, the fact that there were no statistically significant differences between those who completely quit all types of tobacco, cigarettes and *shisha* and those who did not by smoking duration, frequency, quit attempts and cost indicates that there are other factors that play a role in smoking cessation.

However, the improvement in PFR and CO levels in subsequent visits and the lower rates among quitters than non-quitters are promising and indicate better lung health among tobacco quitters. The fact that 93.3% required NRT implies that the clinic attendees were those who could not successfully quit tobacco smoking through counseling alone because of tobacco dependence. This also underscores the scale of economic burden on controlling tobacco smoking by the MOH in Bahrain and thus calls upon more efforts to be focused towards prevention of initiation of tobacco smoking.

Our study showed that clients who were able to quit all forms of tobacco had made one additional visit to the QTC (P=0.004) and 1.4 more counseling sessions (P=<0.000) than those who did not quit. We also found that quitters had abstained for 9.3 months more than the non-quitters (P=0.038). The lower satisfaction rates related to clinic days and opening hours warrants attention. Therefore, increasing QTC accessibility through expanding the clinics to other areas of the country, increasing the open days and working hours provides further opportunity to smokers to receive more counseling sessions to assist them to quit tobacco.

Among the unemployed, there was a statistically significant (P=<0.05) relationship of successful quitting for those having less number of years of unemployment compared to their counterparts who had been unemployed for longer periods. This is probably due to the fact that the later could be more stressed and could resort to tobacco dependence as a relief.

We found that cigarette smokers had a very high tobacco dependence that they would even smoke during illness (P=<0.05) and that most of them would not give up a morning cigarette which, along with the fact that they smoked an average of 27 cigarettes per day for the past 20 years. However their desire to quit tobacco was reflected by the fact that successful quitters reported they would have to buy NRT even if they had to pay for it (P=0.05).

We did not find any significant difference in the successfully quitting with respect to the type and method of NRT uses; however as most quitters used a combination of a nicotine patch and gum we assume that it was the best method in Bahrain to practice and was found to be highly acceptable and convenient by the quitters. The high satisfaction rates with the staff and the counseling is rewarding.

Strengths and limitations: The main study limitation was the low response rate. It was followed by the incompleteness of data on PFR and CO levels as well as the disparity in commitment among data collectors and lack of motivation of study participants. The strengths of our study was that our study was the first of its kind in assessing a national tobacco intervention from a GCC country. Having QTC management as part of the study team would hopefully give improve the quality of QTC services and healthcare policy makers in Bahrain would consider empowering these clinics and increasing their geographical distribution.

Conclusions:

The findings emphasize the important role these clinics play in tobacco control in Bahrain but call upon continuous monitoring and evaluation. Further, dissemination of information about the clinic by the healthcare providers and the MOH in particular is of paramount importance.

Recommendations:

For healthcare providers and health institutions

1. More efforts should be made by healthcare professionals, particularly physicians to inform smokers among their patients of the QTC.
2. Future prospective studies should be conducted to overcome the refusals of the clinic attendees to come to the clinic for research purposes and thus decrease the non-response rate.
3. Inclusion of quit tobacco interventions in the healthcare professionals' training curricula

For policy makers in Bahrain

Policy makers might consider the following:

1. Monitor the clinic files due to the incompleteness of files with regard to PFR and CO levels were for all visits of the clients
2. Increase working hours and open days for the QTC
3. Expand the QTC to other areas
4. Increase awareness about the QTC clinics through educational establishments, schools , colleges and universities and media

Unforeseen challenges during the study period:

- There was a delay in the start of the study due to several factors:
    1. Delay in receiving the ethical approval of CMMS, AGU due to change in the chairmanship and membership of committee (Email sent to WHO/EMRO on 9 April 2015).
    2. Delay in receiving the ethical approval from MOH.
    3. Communication issues as explained in emails sent to WHO/EMRO on 12 April 2015 and 2 December 2015 by the P.I.
    4. Late revisions in the proposal were requested by WHO/EMRO in an email on 7 October 2015
- The start of data collection was at the beginning of August which is one of the hottest months in Bahrain and people are reluctant to go outdoors as well as it is a summer holiday for many.
- The number of holidays during the data collection period: *Eid Al Adha* (23-25 September), *Hijri* New Year (14 October), *Ashura* (22-23 October), National Day (16-17 December), Prophet's Birthday (23 December).
- Unforeseen leaves: One of the Co-P.Is was among the physicians who accompanied the Bahraini pilgrims to Hajj for about two weeks in September. Two data collectors also went on leaves during data collection.
- Reluctance of participants to come to the QTC for the interviews.

- Some contact numbers of the participants were invalid as they had prepaid mobile SIM cards which they had changed.

Time Frame:

A: Original Time Frame of Proposed Activities (Gantt chart)

The original time frame (A) given below has been modified (B) because of the challenges described later in the report.

Starting Month: March_____ ***Year***:____2015_____												
Activity	**1st QUARTER**			**2nd QUARTER**			**3rd QUARTER**			**4th QUARTER**		
	M 1	**M 2**	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 1 0	M 11	M 12
Ethical approval, finalization of Questionnaire (Including Translation)	**X**	**X**										
Hiring and training of Data Collectors	**X**	**X**	**X**									
Development of the sample frame and identification of sample, arrangement of interviews, organization of the field work,			**X**									
Data Collection			**X**	**X**								
Submission of the Progress Report*					**X**							
Data entry and compilation						**X**						
Analysis of the data							**X**					
Report writing								**X**				
Internal review of the report									**X**	**X**		
Dissemination: seminar, meetings and development of brochures										**X**		
Submission of the Final Report*										**X**		

B. Revised Time Frame of Proposed Activities (Gantt chart)

Starting Month: August ***Year***:____2015												
Activity	**1st QUARTER**			**2nd QUARTER**			**3rd QUARTER**			**4th QUARTER**		
	M 1	**M 2**	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 1 0	M 11	M 12
Ethical approval, finalization of Questionnaire (Including Translation)		**X (AGU)**		**X (MOH)**								
Hiring and training of Data Collectors						**X**						
Development of the sample frame and identification of sample, arrangement of interviews, organization of the field work,					**X**							
Data Collection						**X**	**X**	**X**	**X**	X		
Submission of the Progress Report*										X		
Data entry and compilation									**X**	X		
Analysis of the data										**X**	X	
Report writing										**X**	X	
Internal review of the report											X	
Dissemination: seminar, meetings and development of brochures											X	
Submission of the Final Report*											X	

Annex 1: Arabic Questionnaire

اسم العيادة		الرقم التسلسلي	

رقم تسجيل المريض في العيادة		التاريخ	

الرقم التسلسلي	السؤال	الخيارات	الإجابة	التعليمات
المعلومات الديموغرافية و الاجتماعية				
.1	عمر المشترك			من خلال الملف
.2	المستوى التعليمي	1. أمي 2. ابتدائي 3. اعدادي 4. ثانوي 5. جامعي 6. دراسات عليا		
.3	ما هو العدد الإجمالي لسنوات التعليم الخاصة بك؟			الجواب الفعلي
.4	الحالة الاجتماعية	1. أعزب 2. خاطب 3. متزوج 4. مطلق 5. أرمل		إذا كانت الإجابة أعزب أو خاطب، اذهب إلى سؤال 6
.5	عدد الأطفال			حدد
.6	الدخل	1. ---------- 2. لا اعلم 3. رفض الاجابة		اجمالي الدخل الشهري للأسرة بالدينار البحريني
.7	المهنة			حدد المهنة بدقة
.8	الجنسية			الجواب الفعلي
.9	هل سبق لك أن كنت عاطلا عن العمل؟	1. نعم 2. لا		إذا كانت الإجابة 2، اذهب الى سؤال 11
.10	ما هي أطول مدة كنت فيها عاطلا عن العمل؟			المدة بالسنوات و الشهور
تدخين التبغ قبل محاولة الإقلاع				
.11	ما نوع منتج التبغ الذي كنت تدخنه عادة قبل محاولة الإقلاع ؟	1. سجائر 2. الشيشة 3. سيجار 4. غليون 5. شيروت		حدد إذا كان أكثر من نوع واحد **(اذا لم تتضمن الاجابة السجائر، اذهب إلى سؤال 24)**
السجائر:				
.12	في أي عمر بدأت تدخين السجائر؟			العمر الفعلي بالسنوات و الشهور
.13	ما هو السبب الذي جعلك تبدأ بتدخين السجائر؟			السبب الفعلي
.14	كم محاولة قمت بها للإقلاع عن تدخين			العدد الفعلي

	السجائر من قبل؟			
.15	كم عدد السجائر التي كنت تدخنها في يوم عادي قبل الإقلاع؟			العدد الفعلي
.16	ما هي مدة تدخينك للسجائر قبل محاولة الإقلاع؟	سنوات---------- شهور----------		السنوات و الشهور
.17	ما هي ماركة السجائر التي كنت تدخنها غالبا؟	1.---------- 2. لا أعلم		الماركة الفعلية
.18	كم كنت تنفق على تدخين السجائر في يوم عادي؟			دينار بحريني
.19	متى كنت تدخن أول سيجارة بعد الاستيقاظ مباشرة؟	1. خلال 5 دقائق 2. خلال 6 الى 30 دقيقة 3. خلال 31 الى 60 دقيقة 4. بعد 60 دقيقة		
.20	هل كنت تدخن السجائر في الساعات الأولى من الصباح أكثر من بقية اليوم؟	1. لا 2. نعم		
.21	ما هي السيجارة التي كنت تكره التخلي عنها؟	1. أول سيجارة في الصباح 2. أي سيجارة في اليوم		
.22	هل كنت تدخن السجائر حتى و أنت مريض جدا و ملازم للفراش؟	1. لا 2. نعم		
.23	هل كنت تجد صعوبة في الامتناع عن تدخين السجائر في الأماكن المحظور التدخين فيها؟	1. لا 2. نعم		
الشيشة (إذا لم يدخن الشيشة، اذهب إلى سؤال 37)				
.24	في أي عمر بدأت تدخين الشيشة؟			العمر الفعلي بالسنوات و الشهور
.25	ما هو السبب الذي جعلك تبدأ بتدخين الشيشة؟			السبب الفعلي
.26	كم محاولة قمت بها للإقلاع عن تدخين الشيشة من قبل؟			العدد الفعلي
.27	كم عدد رؤوس الشيشة التي كنت تدخنها في أسبوع عادي قبل الإقلاع؟			العدد الفعلي
.28	ما هي مدة تدخينك للشيشة قبل محاولة الإقلاع؟	سنوات---------- شهور----------		السنوات و الشهور
.29	ما هي ماركة تبغ الشيشة التي كنت تدخنها غالبا؟	1.---------- 2. لا أعلم		الماركة الفعلية
.30	ما هي نكهة الشيشة التي كنت تدخنها غالبا؟			النكهة الفعلية
.31	كم كنت تنفق على تدخين الشيشة في أسبوع عادي؟			دينار بحريني

.32	متى كنت تدخن أول شيشة بعد الاستيقاظ مباشرة؟	1. خلال 5 دقائق 2. خلال 6 الى 30 دقيقة 3. خلال 31 الى 60 دقيقة 4. بعد 60 دقيقة		
.33	هل كنت تدخن الشيشة في الساعات الأولى من الصباح أكثر من بقية اليوم؟	0. لا 1. نعم		
.34	ما هي الشيشة التي كان يصعب عليك الامتناع عنها؟	1. أول شيشة في الصباح 2. أي شيشة في اليوم		
.35	هل كنت تدخن الشيشة حتى و أنت مريض جدا و ملازم للفراش؟	0. لا 1. نعم		
.36	هل كنت تجد صعوبة في الامتناع عن تدخين الشيشة في الأماكن المحظور التدخين فيها؟	1. لا 2. نعم		
الأسئلة المتعلقة بالإقلاع عن التبغ				
.37	هل توقفت عن تدخين السجائر بعد تلقي العلاج في عيادة الإقلاع عن التبغ؟	0. نعم 1. لا 2. لا ينطبق		
.38	هل توقفت عن تدخين الشيشة بعد تلقي العلاج في عيادة الإقلاع عن التبغ؟	0. نعم 1. لا 2. لا ينطبق		
.39	هل توقفت عن تدخين الأنواع الأخرى من التبغ بعد تلقي العلاج في عيادة الإقلاع عن التبغ؟	0. نعم 1. لا 2. لا ينطبق		
.40	ما هو السبب الفعلي الذي جعلك غير قادر على الاقلاع عن المنتجات الأخرى؟			حدد السبب للذين لم يقلعوا عن جميع أنواع التبغ **(لا ينطبق للذين أقلعوا عن جميع أنواع التبغ)**
.41	كم من الوقت استغرقك الإقلاع تماما عن هذا المنتج/المنتجات؟	أسابيع------- شهور------- **لم يقلع** --------		
.42	بشكل عام كم عدد محاولات الإقلاع عن التدخين التي قمت بها؟			العدد الفعلي
.43	ما هو أهم سبب دفعك للتوقف عن تدخين التبغ؟	1. الصحة 2. المال 3. العائلة 4. العمل 5. الرائحة 6. اجتماعية/ثقافية 7. أخرى(حدد)		اذكر سبب واحد
.44	من الذي قام بتحويلك لهذه العيادة؟	1. الطبيب 2. الممرض 3. الصديق 4. القريب 5. آخرين(حدد)		
.45	هل كان التحويل بسبب مرض ما؟	1. نعم (اذكر نوع المرض) 2. لا		المرض

.46	إن كنت أقلعت إقلاعا تاما عن تدخين جميع أنواع التبغ، فمنذ متى حدث ذلك ؟	سنوات----- شهور------ أسابيع ------ أيام--------- **لم يقلع**----------		حدد المدة الفعلية
.47	هل كانت هناك انتكاسة في محاولة إقلاعك؟	1. نعم 2. لا 3. **لم يقلع**		اذا كانت الإجابة لا، اذهب الى سؤال 49
.48	ما هو السبب للبدء في التدخين مرة أخرى؟			اذكر السبب الفعلي
.49	ما هي أطول مدة امتنعت فيها عن التدخين؟	سنوات شهور		سنوات و شهور
.50	ما هي أكثر الأعراض الإنسحابية التي مررت بها أثناء الإقلاع؟			الأجوبة الفعلية
.51	ما هو الدعم الأهم الذي تلقيته أثناء الإقلاع؟	1. العائلة 2. الأصدقاء 3. الطبيب 4. أخرى (اذكرها)		أخرى، اذكرها
.52	هل تلقيت أي بدائل للنيكوتين؟	1. نعم 2. لا		**اذا كانت الإجابة لا، اذهب إلى سؤال 54**
.53	رجاءا اذكر وسائل العلاج التي تلقيتها و مدة العلاج.	**مدة الاستخدام** 1. علكة النيكوتين---------- 2. لصقة النيكوتين---------- 3. حبوب (بيبروبيون)-------- 4. حبوب (جامبيكس)------- 5. علاج تقليدي/عشبي-------		حدد مدة استخدام كل وسيلة
الأسئلة المتعلقة بعيادة الإقلاع عن التدخين				
.54	هل عليك شراء أي من الأدوية المطلوبة للعلاج؟	1. نعم 2. لا		اذا كانت الإجابة لا، اذهب إلى سؤال 56
.55	هل كان ثمن الأدوية بأسعار مناسبة لك؟	1. نعم 2. لا		
.56	هل ستقوم بأخذ الدواء اذا كنت أنت من سيدفع ثمنه؟	1. نعم 2. لا		
.57	كم مرة قمت بزيارة العيادة في السنة الماضية؟			مفتوح
.58	كم مرة تلقيت استشارة أو نصيحة خلال زيارتك للعيادة في هذه المدة؟			مفتوح

.59	ما هو المصدر الأساسي الذي تلقيت منه معلومات عن العيادة؟	1. التلفاز 2. الراديو 3. الجرائد و الصحف 4. الأصدقاء 5. العائلة 6. الإنترنت 7. أخرى (حدد)----------		أخرى، اذكرها
.60	ما مدى رضاك عن خدمات عيادة الإقلاع؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.61	ما مدى رضاك عن الإستشارة التي قدمت لك في العيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.62	ما مدى رضاك عن بيئة العيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.63	ما مدى رضاك عن سلوك العاملين بالعيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.64	ما مدى رضاك عن وقت الانتظار بالعيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.65	ما مدى رضاك عن أيام عمل العيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.66	ما مدى رضاك عن أوقات عمل العيادة؟	1. غير راض 2. راض قليلا 3. راض 4. راض جدا 5. راض تماما		
.67	كم عدد المدخنين الذين نصحتهم باللجوء الى هذه العيادة؟			الجواب الفعلي

	النتيجة التي تم عملها في أول زيارة للعيادة	أي نتائج أخرى بزيارات أخرى	أي نتائج أخرى بزيارات أخرى	الزيارة الحالية
التاريخ				
جهاز كفاءة الرئة				
نسبة أول أكسيد الكربون بالنفس				

Annex 2: English Questionnaire

Name of the clinic		ID No.	
Date		Reg. No of patient at the clinic	

S.No.	Question	Options	Responses	Instructions
Sociodemographic				
68.	Age of the participant			Obtained from file
69.	Educational level	1. Illiterate 2. Primary 3. Secondary 4. Graduate 5. Postgraduate		
70.	What is the total number of years of your education?			Actual answer
71.	Marital status	1. Single 2. Engaged 3. Married 4. Divorced 5. Widowed		If single or engaged, go to Q6
72.	Number of children			Specify
73.	Income	1.---------- 2.Don't Know 3. Refused		Monthly total income of household in BHD
74.	Occupation			Specify exact occupation
75.	Nationality			Actual answer
76.	Have you ever been unemployed	1. Yes 2. No (Go to Q 11)		
77.	What was the longest duration you were unemployed?			Duration in years and months
Tobacco smoking before the quit attempt				
78.	What form of tobacco product you usually smoked?	1. Cigarette *2. Shisha* 3. Cigar 4. Pipe 5. Cheroot		Specify if more than one **(If answers do not include cigarettes, go to Q24)**
Cigarettes				
79.	At what age did you start cigarette smoking?			Actual age in years and months
80.	What was your reason to start cigarette smoking?			Actual reason

81.	How many times did you try to quit smoking cigarettes before?			Actual number
82.	How many cigarettes you smoked in a typical day before quitting?			Actual number
83.	For how many years have you been smoking cigarettes before quitting?	Years ---------- Months_----------		Years and months
84.	What brand of cigarettes you mostly smoked?	1.---------- 2.Don't Know		Actual Brand
85.	How much did you spend on cigarette smoking in a typical day?			BHD
86.	How soon after you used to wake up did you smoke your first cigarette?	0-Within 5 minutes 1-Within 6-30 minutes 2-Within 31-60 minutes 3-After 60 minutes		
87.	Did you smoke cigarettes more frequently during the first hours after awakening than during the rest of the day?	0-No 1-Yes		
88.	Which cigarette did you hate most to give up?	1-The first in the morning 0-Any other		
89.	Did you smoke cigarettes even if you are so ill that you are in bed most of the day?	0-No 1-Yes		
90.	Did you find it difficult to refrain from cigarette smoking in places where it is forbidden?	0-No 1-Yes		
Shisha(If does not smoke shisha, Go to Q37)				
91.	At what age did you start *shisha* smoking?			Actual age
92.	What was your reason to start *shisha* smoking?			Actual reason
93.	How many times did you try to quit smoking *shisha* before?			Actual number
94.	How many *shisha's* you smoked in a typical week before quitting?			Actual number
95.	For how many years have you been smoking *shisha* before quitting	Months---------- Years----------		Years and months
96.	What brand of *shisha* you mostly smoked?	1.---------- 2. Don't Know		Actual Brand

97.	What *shisha* flavor you mostly smoked?			Actual flavor
98.	How much did you spend on *shisha* smoking in a typical week?			BHD
99.	How soon after you used to wake up did you smoke your first *shisha*?	0-Within 5 minutes 1-Within 6-30 minutes 2-Within 31-60 minutes 3-After 60 minutes		
100.	Did you smoke *shisha* more frequently during the first hours after awakening than during the rest of the day?	0-No 1-Yes		
101.	Which *shisha* did you hate most to give up?	1-The first in the morning 0-Any other		
102.	Did you smoke *shisha* even if you are so ill that you are in bed most of the day?	0-No 1-Yes		
103.	Did you find it difficult to refrain from *shisha* smoking in places where it is forbidden?	0-No 1-Yes		
Tobacco Cessation Related Questions				
104.	Did you quit smoking cigarettes after receiving treatment at the tobacco cessation clinic?	0-No 1-Yes 2- Not Applicable		
105.	Did you quit smoking *shisha* after receiving treatment at the tobacco cessation clinic?	0-No 1-Yes 2- Not Applicable		
106.	Did you quit smoking all the other forms of tobacco after receiving treatment at the tobacco cessation clinic?	0-No 1-Yes 2- Not Applicable		
107.	What was the reason you were not able to quit other product (s)?			Actual reason for all those who did not quit all types of tobacco **(Not applicable for those who quit all types of tobacco)**
108.	How long did you take to completely quit smoking that product (s)?	Weeks------ Months------ **Did not quit----------**		
109.	In general how many quit attempts have you made?			Actual answer

110.	What was the most important reason for you to quit tobacco smoking?	1- Health 2- Economic 3- Family 4- Work related 5- Smell 6- Social/Cultural 7- Other (Specify)		Only One Answer
111.	Who were you referred by to this clinic?	1- Own Physician 2- Nurse 3- Friend 4-Relative 5- Other (Specify)		
112.	Was the referral because of any illness?	1-Yes (Specify Illness) 2- No		Illness
113.	If you have quit how many days/weeks/months or years ago?	Years------- Months------ Weeks------- Days--------- **Did not quit**----------		Years and months
114.	Has there been any relapse in you quitting?	1-Yes 2- No **3. Did not quit**		If No, go to Q49
115.	What was the reason to start smoking again?			Record actual reason
116.	What has been maximum abstinence period from tobacco smoking?	Years-------- Months-------		Years and months
117.	What most common withdrawal symptoms you experienced during quitting?			Actual answers
118.	What was the most important support during the quitting?	1- Family 2-Friends 3-Doctor 4- Other (Specify)		Specify other
119.	Did you receive any nicotine replacement treatment?	1-Yes 2- No		If No, go to Q 54
120.	Please mention supportive/nicotine replacement treatment you received during your quit treatment and duration of treatment?	**Duration of use** 1- Nicotine Gum---------- 2- Nicotine Patch---------- 3- Tablets (Bupropion)---------- 4- Tablets (Champix)---------- 5- Traditional/herbal medicine----------		Specify Duration of Use for Each

Quit Smoking Clinic Related Questions				
121.	Did you have to purchase any of the medication for treatment?	1-Yes 2- No		If No, go to Q 56
122.	Was the cost affordable to you?	1-Yes 2- No		
123.	Would you have gone to receive the treatment if you had to pay?	1-Yes 2- No		
124.	How many times did you visit the cessation clinic during the last year?			Open
125.	How many counseling/advice sessions did you receive in the clinic during this time?			Open
126.	What was the main source of information about the cessation clinics?	1- TV 2- Radio 3- Newspaper 4- Friends 5- Family 6- Internet 7- Any other----------		Specify any other
127.	Generally how much are you satisfied about the clinic services?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
128.	How much are you satisfied with the advice/Counseling session/s you received at the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
129.	How much you are satisfied with the environment at the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
130.	How much are you satisfied with the staff behavior at the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		

131.	How much are you satisfied with the waiting time at the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
132.	How much are you satisfied with the opening days at the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
133.	How much are you satisfied with the opening hours of the clinic?	1- Not satisfied 2- Slightly satisfied 3- Satisfied 4- Very satisfied 5- Completely satisfied		
134.	How many smokers have you recommended this clinic to?			Actual answer

Results of Pulmonary Function Tests

	Results from test done at the time of initial visit done for smoking cessation	**Test results on any additional visit**	**Test results on any additional visit**	**Current results**
Date				
Peek flow meter				
Respiratory carbon monoxide levels				

Annex 3: Ethical approval from AGU

Arabian Gulf University
COLLEGE OF MEDICINE AND MEDICAL SCIENCES

جامعة الخليج العربي
كلية الطب والعلوم الطبية

Research and Ethics Committee

Project Number: **25-PI-01/15** Date: 5 April 2015

Name of Principal Investigator (PI): **Prof. Randah R Hamadeh**

Title of PI: **Professor** Department: **Community Medicine**

Title of submitted Research Project: "**Effectiveness of tobacco smoking clinics in improving tobacco smoking quit rates and lung function among adult males in Bahrain"**

Dear Professor Hamadeh,

The research and Ethic committee has reviewed your project and decided that the research area conforms with the CMMS research plan and decided to **approve** your application. Good luck with your project.

Professor Diaa Rizk
Chair of Research and Ethics committee.

P.O.BOX: 22979, KINGDOM OF BAHRAIN, TEL.: 17239999, FAX: 17271090 ص . ب : ٢٢٩٧٩، مملكة البحرين، تليفون : ١٧٢٣٩٩٩٩، فاكس : ١٧٢٧١٠٩٠
www.agu.edu.bh

Annex 4: Ethical approval from MOH Bahrain

KINGDOM OF BAHRAIN
MINISTRY OF HEALTH
Office of Asst. Undersecretary for Training & Planning

مملكة البحرين
وزارة الصحة
مكتب الوكيل المساعد للتدريب والتخطيط

No:MA/LA/ 348 /2015
Date: 15/06/2015

To: Prof. Randah Hamadeh
Vice Dean for Graduate Studies and Research,
Family & Community Medicine, AGU

Co-investigators: Dr. Jamil Ahmed, Dr. Maha Al-Kawari, Dr. Sharifa Bucheeri

Subject: Letter of Approval for Research Proposal:

"Effectiveness of tobacco smoking cessation clinics in improving tobacco smoking quit rates and lung function among adult males in Bahrain"

Dear Dr. Randah,

Thank you for submitting your research proposal documents, which have been considered by members of the MOH Research Technical Support Team (RTST) on 15th June 2015.

We would like to inform you that the team found no major ethical issues or methodological problems that would hinder the conduct of this study. We are thus pleased to approve the above application.

This approval is subject to the following conditions:

1. We expect that the study will begin within 6 months of the date of this approval.
2. Approval from an MOH Research Committee does not automatically imply that the researcher is granted access to data, medical records or biological samples from MOH healthcare facilities. Researchers must seek permission and follow procedures as dictated by the concerned departments after presenting them with a valid MOH approval letter.
3. Any significant change, which occurs in connection with this study and/or which may alter its ethical consideration, must be reported immediately to the RTST.
4. This approval is valid for up to **1 year** from the date of approval. If the study extends beyond this date, a progress report must be sent to the RTST to renew the approval.
5. The RTST must be informed when the research has been completed and a copy of the final research report must be submitted for our records.

We wish you all the best in this study.

Yours sincerely,

Dr. Mohammed Amin Al Awadhi
Chairperson, Research Technical Support Team
Assistant Undersecretary for Training and Planning

CC: Team file

هاتف: ٢٨٦٠٤١ ١٧ (٩٧٣+) - فاكس: ٢٨٦٦٤١ ١٧ (٩٧٣+) - ص.ب: ٢٢١١٨ - المنامة - مملكة البحرين
Tel: (+973) 17 286041 - Fax: (+973) 17 286641 - P.O. Box: 22118 - Manama - Kingdom of Bahrain

Annex 5: Consent form in Arabic

استمارة الموافقة للمشاركة في الاستبيان

فعالية عيادات الإقلاع عن التدخين في تحسين معدل الإقلاع عن التدخين ووظائف الرئة بين الذكور البالغين في البحرين

الباحث الرئيسي: الاستاذه الدكتورة رنده حماده

اسمي الأستاذة الدكتورة رنده حماده وأعمل في كلية الطب والعلوم الطبية بجامعة الخليج العربي في مملكة البحرين.
يقوم بهذه الدراسة فريق من جامعة الخليج العربي وعيادات الإقلاع عن التدخين بوزارة الصحة في البحرين لتقييم فعالية العيادات التي تقدم خدمات المساعدة للمدخنين الراغبين في الإقلاع عن التدخين.
هذه الدراسة ستساعدنا على فهم مدى نجاح مدخني التبغ في الإقلاع عن عادتهم وما مدى فعالية العيادات في مساعدة المدخنين في الإقلاع عن التدخين. واستنادا إلى المعلومات التي سيتم الحصول عليها من المشاركين في هذا البحث نتوقع التوصل إلى استنتاجات من شأنها أن تساعد في تحسين نوعية الخدمات المقدمة في هذه العيادات وتحسين معدل الإقلاع عن التدخين في البحرين.
سنقوم بمقابلة 354 مشارك بما فيهم أنت. إن مشاركتك ستكون طوعية حيث ستقوم بالإجابة على مجموعة من الأسئلة المتعلقة بعادة التدخين لديك ومدى رضاك عن الخدمات التي تلقيتها من العيادة وسيتطلب هذا الاستبيان نحو نصف ساعة من وقتك و لن يتوجب عليك كتابة اسمك على الاستبيان كما أن المعلومات التي سيتم تحصيلها ستعامل بسرية تامة. كما سنكون بحاجة إلى المعلومات الصحية والمعلومات الخاصة بتدخينك من خلال الملف الخاص بك في العيادة. هذا وسنقوم بعمل اختبار لوظيفة الرئة وسنستخدم هذه المعلومات من أجل معرفة كيف أن الإقلاع عن التبغ يحسن وظائف الرئة.
سنكون في غاية الامتنان لمشاركتك حيث ستساعد هذه البيانات على تحسين الخدمات التي تقدمها عيادات الإقلاع عن التدخين في البلاد وسنكون في غاية الامتنان لمشاركتك. هذا ولديك مطلق الحرية بعدم المشاركة أو الانسحاب من الدراسة في أي مرحلة من المراحل.

إذا كان هناك أي استفسار بخصوص هذه الدراسة لا تتردد في الاتصال بي على

رقم الهاتف النقال: 39686003
رقم هاتف المكتب: 17239423
الايميل: randah@agu.edu.bh

توقيع المشارك:_____ التاريخ:_____

Annex 6: Consent form in English

I.D. Number | | | | |

EFFECTIVENESS OF SMOKING CESSATION CLINICS IN IMPROVING SMOKING QUIT RATES AND LUNG FUNCTION AMONG ADULT MALES IN BAHRAIN

My name is Prof. Randah Hamadeh and I work at the College of Medicine and Medical Sciences, Arabian Gulf University (AGU) Bahrain. This study has a team from AGU and the Smoking Cessation Clinics, Ministry of Health, Bahrain to evaluate the effectiveness of the clinics which provide services for helping smokers quit smoking. The study will help us understand how successfully tobacco smokers quit their habit and how effective are the clinics in helping people quit tobacco smoking. Based on the information obtained from the participants of this research we expect to draw conclusions which will help improve the quality of services at these clinics and improve the tobacco smoking quit rates in Bahrain.

We will interview a total of 354 participants including you. You shall be participating voluntarily and will be required to reply to a set of questions related to your habit and history of smoking and satisfaction with the services you received from the clinic. This interview will require about half an hour of your time. The information obtained through the questionnaire shall be kept secure and confidential. Your name will not be written on the questionnaire form. We will also need to access your health and smoking related information from the clinic and will offer you a free Lung function test to understand how quitting tobacco improves lung function.

Your contribution in this research will be highly appreciated as the information will be used to help improve the services of the cessation clinics in the country. However, you are free not to participate or to withdraw from the study at any stage.

If there is any query regarding this survey please feel free to contact me at

Mobile: 39686003
Office: 17239423
Email: randah@agu.edu.bh

Signature of Participant_____ Date_____