

## Is Cost of Medication for Quit Smoking Important for Smokers, Experience of Using Champix in Iranian Smoking Cessation Program 2016

### Abstract

**Background:** Providing smoking cessation services are special importance to tobacco control programs. To date, Champix is a new expensive medication for smoking cessation available nationally. Champix has both agonist and antagonist activities and can reduce nicotine dependence and withdrawal symptoms. The purpose of this study was to evaluate the duration of using Champix based on its cost. **Methods:** This quasi-experimental study was conducted with smokers presenting to the Tanaffos Smoking Cessation Clinic in Tehran, Iran 2016. Smokers were visited by a physician 3 times at 1-week intervals for counseling. Smokers started to use Champix and stopped smoking in the 2nd week of counseling and were followed up by phone and through regular visits to the clinic at 1, 3, and 6 months postintervention. Some of them did not continue medication for 12 weeks because of its cost. **Results:** A total of 227 smokers including 133 males (58%) with a mean age of 43 years were enrolled of whom 116 (51.1%), 89 (43.6%), and 34 (20.6%) had quit smoking after 1, 3, and 6 months, respectively. Quit rates were significantly higher among those who used Champix for more than 6 weeks, and this rate was not correlated with age, sex, educational level, or nicotine dependence. **Conclusions:** Use of Champix for more than 6 weeks increases the quitting success rate compared with using for a shorter time. The cost of Champix was important for smokers and adding Champix to the list of insurance medication or getting it free of charge is needed.

**Keywords:** *Champix, quit, smoking*

### Introduction

Each year, tobacco consumption has resulted in death of more than 5 million people, and the rate of morbidity and mortality is expected to exceed 8 million annually by the year 2030.<sup>[1]</sup> More than a billion people worldwide are addicted to tobacco products. Many of these people would like to quit, but unfortunately, only a small number of them can benefit from assistance in this respect. Thus, authorities in different countries are responsible for providing low-cost and cost-effective interventions and quit programs to help smokers stop smoking.<sup>[2]</sup> As for any kind of addictive substance, quitting smoking without any outside assistance can be difficult for the majority of smokers. It would be preferred if they overcome their nicotine dependence with the help of their quitting counselor.<sup>[3]</sup>

Treatment of nicotine dependence is among the main responsibilities of

health-care systems worldwide. Several techniques such as a simple medical consultation, pharmaceutical therapy such as nicotine replacement therapy or Champix and over the phone counseling through quit-line have been recommended for this purpose. Repeated consultations during medical visits emphasize the necessity of quitting smoking.<sup>[4,5]</sup> In addition, counseling provided by health-care workers can significantly increase the quit rate.<sup>[6]</sup> Such interventions are extremely efficacious because they are provided by health-care professionals for whom people have respect.<sup>[7,8]</sup> People from and part of a country should have the opportunity to use quit-lines. Expert counselors should be available to assist smokers in quitting through the quit-line. These services are cheap, easily accessible, and confidential and can be accessed at any time since many smokers are not free or interested to call during business hours.<sup>[9]</sup> In Iran, these services are easy available.<sup>[10,11]</sup>

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Champix (Varenicline) is a new medication for smoking cessation using for 12 weeks. Recent studies have shown that these receptors play a major role in extreme nicotine dependence and craving; Champix initially activates the  $\alpha 4$  and  $\beta 2$  subunits, which in turn, moderate nicotinic stimulation at the acumbens nucleus which releases dopamine. If nicotine is consumed during Champix treatment, dopamine release does not increase (antagonist effect). Champix, therefore, has both agonist and antagonist activities and can reduce nicotine dependence and withdrawal symptoms. Champix is rapidly absorbed, and 92% is excreted in the urine. Its half-life is 17 h and it takes 45 min to reach peak concentration.<sup>[12]</sup> The cost of a course of using Champix is about 200 US\$ compare with other medication such as nicotine gum (20 US\$) and bupropion (50 US\$) in Iran. In general, pharmaceutical therapy is more expensive than listening to physicians' recommendations or using quit-lines. However, based on evidence, it increases the quit rate 2–3 fold. On the other hand, the cost of medication may be more than the cost of smoking during the same time period, and this is an economical barrier for smokers to use medication.<sup>[13]</sup>

Many studies on different aspects of quit smoking have been conducted in Iran;<sup>[14–20]</sup> however, none have focused on the best duration of using Champix. This study was conducted to evaluate the efficacy of Champix used for different time periods based on its cost and its effectiveness based on the duration of using.

## Methods

This quasi-experimental study was conducted on smokers presenting to the Tanaffos smoking cessation clinic in Tehran 2016. The sampling method was first-come first-serve and all data were collected from their files retrospectively. Having a history of daily smoking and willing to quit were inclusion and not willing for continuing treatment for any reason was exclusion criteria of this study. All smokers who provided written informed consent were visited by a physician three times with 1-week intervals. They all received similar information and instructions for quitting. Smokers were provided with Champix and advised to use it for at least 10 weeks including 2 weeks for starter pack 0.5 and 1 mg, 4 weeks for the first maintenance pack 1 mg, and 4 weeks for the second maintenance pack 1 mg. Using or stop using of Champix was depending on patients because of its cost.

All smokers presented for assessment of quit outcome during their 1<sup>st</sup> month of abstinence. In addition, they were followed up by phone 3 and 6 months after abstinence. Patients decided to stop using of Champix whenever they want because of its cost so they were divided into three groups of 2 weeks with starter pack, 2–6 weeks with starter pack plus first maintenance pack, and more than 6 weeks with starter pack plus first and second maintenance packs based on the duration of using Champix to evaluate the

effect of duration of treatment. This categorization was done after 6 months of using Champix according their files. Thus, matching of independent variables in the 3 groups was done during the analysis phase.

Demographic characteristics, smoking status, results of the Fagerström Test for Nicotine Dependence (FTND), and level of exhaled carbon monoxide (CO)<sup>[21–24]</sup> were recorded for all smokers in their medical files. Frequency distribution, Chi-square test for difference in frequency of quitting between males and females and smokers of different educational levels, *t*-test, and ANOVA were used for data analysis.  $P < 0.05$  was considered statistically significant.

## Results

A total of 227 smokers participated in this study, of which 133 (58.4%) were male. The mean age of smokers was 43.1 years (range: 18–86 years), and the median age was 42 with interquartile range 4. In terms of level of education, 96 smokers (42%) had a bachelor's or higher degree. The mean smoking experience was  $21.6 \pm 11$  years (range: 2–60 years). They gained a mean score of  $5.5 \pm 2.8$  (range: 0–10) in FTND, and a mean score of  $27.5 \pm 12.8$  (range: 6–94) in exhaled CO test. There was no significant difference in three groups by monthly income.

Successful quit rate was 51.1% (116 individuals) at 1<sup>st</sup> month, 43.6% (89 individuals) at 3 months, and 20.6% (34 individuals) at 6 months.

Smokers were divided into three groups (76 in group 1, 77 in group 2, and 74 in group 3) based on the duration of using Champix. The only reason of difference duration using or not continuing using Champix by patients was the cost.

Table 1 shows the data for independent variables and the significant differences between the three groups in these variables. Table 2 shows the quit outcome at 1, 3, and 6 months follow-ups in the three groups.

In group 3, quit rate at 1, 3, and 6 months was 64.8% (48 from 74 smokers), 62.6% (42 from 67 smokers), and 37% (20 from 54 smokers), respectively higher than two other group significantly ( $P < 0.000$ ).

Chi-square test failed to find a statistically significant difference in frequency of quitting between males and females and smokers of different educational levels. Independent *t*-test did not show a significant correlation between frequency of quitting and age. No significant difference was detected based on FTND and CO expiratory test score using the ANOVA and Tukey's test between the three groups or the Chi-square test between smokers in terms of quitting.

## Discussion

The present study was conducted to compare the efficacy of various durations of Champix and suggested that

**Table 1: Comparison of the independent variables between the three groups based on the duration of using Champix, Tehran 2016**

Duration of using Champix	Group 1	Group 2	Group 3	Significant
	Up to 2 weeks, n (%)	3-6 weeks, n (%)	More than 6, n (%)	
Gender				
Male	41 (30.8)	41 (30.8)	51 (38.3)	0.08*
Female	35 (37.2)	36 (38.3)	23 (24.5)	
Age (mean)	44.1	41.7	43.6	0.4 <sup>+</sup>
Level of education				
Below high school diploma	16 (25)	23 (35.9)	25 (39.1)	0.17*
High school diploma	28 (41.8)	24 (35.8)	15 (22.4)	
Bachelors or higher	32 (33.3)	30 (31.2)	34 (35.4)	
Years of smoking (mean)	21.9	21.4	21.5	0.94 <sup>+</sup>
Monthly income US\$ (mean)	689.72	809.15	724.63	0.11 <sup>+</sup>
Number of previous quit attempts (mean)	1.6	1.7	1.8	0.91 <sup>+</sup>
Nicotine dependence (mean)	5.7	5	5.8	0.16 <sup>+</sup>
Level of exhaled carbon monoxide (mean)	28.2	23.7	30.7	0.42 <sup>+</sup>

\*Chi-square test, <sup>+</sup>Turkey's test

**Table 2: Frequency of quitting at 1, 3, and 6 months among smokers presenting to the smoking cessation clinic based on the duration of using Champix in 2016**

	Group 1	Group 2	Group 3	Total, n (%)
	Up to 2 weeks, n (%)	3-6 weeks, n (%)	More than 6 weeks, n (%)	
1 <sup>st</sup> month				
Quit	17 (14.7)	51 (44)	48 (41.8)	116 (100)
Smoking	59 (53.2)	26 (23.4)	26 (23.7)	111 (100)
Total	76 (33.5)	77 (33.9)	74 (32.6)	227 (100)
3 <sup>rd</sup> month				
Quit	12 (13.5)	35 (39.3)	42 (47.2)	89 (100)
Smoking	56 (48.7)	34 (29.6)	25 (21.7)	115 (100)
Total	68 (33.3)	69 (33.8)	67 (32.8)	204 (100)
6 <sup>th</sup> month				
Quit	2 (5.9)	12 (35.3)	20 (58.8)	34 (100)
Smoking	53 (40.5)	44 (33.6)	34 (26)	131 (100)
Total	55 (33.3)	56 (33.9)	54 (32.7)	165 (100)

P<0.000

long-term use of it improves quit rate. In this study, we were focus on the cost of Champix for smokers, so it is very important for our health system to concern about cost-effectiveness of this intervention which was shown before<sup>[13]</sup> to cover the cost of medication in smoking cessation services nationally as a middle-income country. This issue may apply for other medication also to increase tendency toward quit smoking generally. It might be generated a hypothesis for testing with a randomized clinical trial in near future.

Our finding showed that all smokers tried to use Champix first with starter pack which cost about 40 US\$, but 151 person (66.5%) used first maintenance pack which cost about 75 US\$ plus previous cost, and only 74 person (32.5%) had second maintenance pack

with about 190 US\$ totally. As the only reason for not continuing using Champix was cost, it might related with smokers' willingness for not paying much medication.

The study illustrated that almost half the smokers successfully quit smoking in the 1<sup>st</sup> month of treatment, but this trend fell by 20% at 6 months later. Several studies reveal that relapse after cessation occurs commonly within this time of abstinence.<sup>[25]</sup> Relapse usually happens during the first 6 months of abstinence, especially in the 1<sup>st</sup> month.<sup>[26]</sup> However, in the present study, a difference in using Champix was a key factor, and this finding should be further evaluated in future studies. An important finding of the present study was the high-quit success rate and continued abstinence in smokers who used Champix longer. This finding has also been noted in meta-analysis

and systematic review<sup>[27,28]</sup> that using medication for longer period had better outcomes in quit smoking compare with whom that using it for a short time and should be taken into consideration by the authorities in tobacco control programs to advice smokers who use medication for longer periods of time.<sup>[29]</sup>

According to not significant difference in monthly income between 3 groups and since the only reason to stop the consumption of Champix is the high price for patients, health-care workers have to give them more information about the benefits of this cost comparing to hazards of failure in quit smoking. This issue is cited in the study of Fernández de Bobadilla Osorio *et al.*<sup>[30]</sup> The cost of quit smoking methods was assessed in nationwide studies of Heydari *et al.*<sup>[10,11]</sup> and according to physicians and patients low-cost of smoking cessation treatment was an effective factor in quit smoking; however, in the only clinical trial of Champix in Iran,<sup>[12]</sup> this factor was not seen and assessed because it was given to patients free of charge. It was the only difference between these two studies that showed cost of medication was important for using Champix continuously.

Last, however, we know that pharmaceutical therapy is an expensive intervention for quit smoking but based on evidence, it increases the quit rate 2–3 fold,<sup>[13]</sup> and this is a cost-effectiveness intervention in the health system. The health-care system must concern about this and try to promote its cost benefit in general population and smokers to use medication or add it to the list of insurance medication.

## Conclusions

The cost of Champix was important for smokers and using Champix for more than 6 weeks increases the quitting success rate compared with using for a shorter time.

## Recommendation

Adding Champix to the list of insurance medication or getting it free of charge in smoking cessation services is needed.

## What does this paper add?

Use of Champix with physician counseling on quitting is usually accepted by the smokers.

Longer use of Champix might be a factor for quit smoking.

The free of charge Champix is important for patients.

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## Conflicts of interest

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