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Research Article

Smoking Cessation and Dependence: A Local Experience

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Abstract

Background: Smoking is an avoidable behavioral cause of premature morbidity and mortality. The initiation, continuation and dependence of smoking are associated with several personal, environmental and socio-cultural factors which vary between age groups and geographical regions.

Objective: To investigate the pattern of smoking cessation and the extent of the smoking dependence among smokers in urban and rural societies in Egypt.

Methods: A cross-sectional study was conducted targeting a random sample of 552 adult smokers aging 11-75 years. All participants were inquired about their demographic features, life style and behaviors, motives for smoking cessation and quitting attempts using a predesigned interviewing questionnaire. Nicotine dependence was assessed using Fagerström scoring scale.

Results: About 28.1% of the participants admitted a motivation to quit smoking and about 61.1% had at least an attempt. The longest duration of quitting was ≥5 years as reported by utmost 4.0% of the smokers. The drive to quit smoking was advice of a family member (39.9%) or a doctor (30.1%), concerns about smoking hazards (19.7%) or due to financial limitations (12.7%). The more frequently used method to quit smoking were cold turkey (23.4%), gradual reduction (15.9%), and the use of nicotine replacement therapy (12.5%). Moderate and high nicotine dependence was achieved by 46.7% and 24.6% respectively. Moderate and high nicotine dependence was achieved by 46.7% and 24.6% respectively. Male gender was the single predictor of smoking dependence. Motivation to stop smoking was associated with the presence of social support and having low dependence score.

Conclusion: Nicotine dependence was significant at younger ages. Therefore, smoking cessation program should be a top priority and targeted to prevent smoking in adolescence. Appropriate interventions addressing individuals' motives and considering pharmacotherapy are needed to encourage successful quit attempts.

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INTRODUCTION

Tobacco use is recognized as a major epidemic worldwide. The World Health Organization (WHO) reported that there are over 1.3 billion smokers worldwide, of which more than five million people die globally each year because of smoking. More than 80% of tobacco-attributable deaths are predicted to occur in developing countries [1]. In Egypt, smoking prevalence has become a major public health problem and Egypt is considered the biggest consumer of cigarettes in the Arab world. Over the past three decades, the number of smokers in Egypt has increased over twice as fast as the population [2]. WHO estimated the prevalence of cigarette smoking in Egypt among those aged 15 years or more in both sexes in the year 2015 to be 18.9%, and 4.8% among youth aged 13-15 years [3].

The 1988 report of the US Surgeon General identified cigarette smoking as nicotine addiction [4]. The Royal College of Physicians similarly concluded that nicotine is an addictive drug on par with heroin and cocaine, and that the primary purpose of smoking tobacco is to deliver a dose of nicotine rapidly to the brain. The Diagnostic and Statistical Manual of Mental Disorders classifies nicotine-related disorders into the sub-categories of dependence and withdrawal which may develop with the use of all forms of tobacco [5].

Smoking cessation is the most important, cost-effective preventive intervention that can be offered to a smoker individual. Helping smokers to stop smoking should be the goal of every health professional through a motivational process [6]. This process begins with counseling; a skill that requires the ability to evaluate smoker's readiness to quit and to encourage them into effective action. Although the health benefits are greater for people who stop at earlier ages, there are benefits at any age [7]. Scholars have proposed effective interventions to reduce the prevalence of chronic diseases, of which tobacco control is identified as the most urgent and immediate priority [8,9]. Quitting smoking is hard and may require several attempts. People who stop smoking often start again because of withdrawal

symptoms, stress, and weight gain [10,11]. In a study in the U.S. population, successful quit attempts were associated with smoke free-homes and no-smoking policy at work, older age (35 years or more), having at least a college education, being married or living with a partner, being a non-Hispanic White, having a single life time quit attempt, and not switching to light cigarettes [12].

The level of nicotine dependence is important in assessing the effectiveness of smoking prevention and control programs [13]. There are several scales available for measuring addiction level, the Fagerström Tolerance of Nicotine Dependence (FTND) is the most widely used as it consists of only six items, can be easily administered, non-invasive, provides a quantitative measure and is able to conceptualize addiction level through behavioral and physiological symptoms [14].

Hence, this study was conducted to investigate the pattern of smoking cessation and the extent of the smoking dependence among a sample of smokers in urban and rural societies in Egypt.

METHODS

Study setting, design and population

A cross-sectional descriptive study was conducted in 2015 at different rural and urban districts in Alexandria, Behira and Cairo governorates; the largest three cities in Egypt. The population structure in these cities is a mixture of urban and rural communities. The survey targeted smokers and ex-smokers that were recruited from institutions, households, universities, and some health care units. Based on a smoking prevalence of 46.4% among adult male Egyptian population [3], the minimal required sample size was calculated to be 500 subjects. Participants were enrolled consecutively in the study until the required sample size was fulfilled.

Data collection method and tools

A structured interviewing questionnaire was developed based on literature review, and was used to collect data about the socio-demographic characteristics of the enrolled subjects, smoking history including age at starting smoking, smoking index, smoking cessation history including numbers of trials and methods of cessation. Assessment of smoking dependence was done using Fagerström scoring scale [14,15]. The test was designed to provide an ordinal measure of nicotine dependence related to cigarette smoking. It contains six items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. Of all the items in the questionnaire, number of cigarettes per day and time of first cigarette of the day seem to be the most important indicators of dependence. The yes/no items are scored from 0 to 1 and multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0-10; the higher the score on this questionnaire, the higher the level of dependence. Achieving 0 – 3 points=low score; 4 – 6 points=medium score; 7 – 10 points=high score.

Statistical analysis

Data were collected, revised for accuracy and completeness, coded and fed to statistical software SPSS [version 16.0]. All statistical analysis was done using two tailed tests and alpha error of 0.05. Significance of the obtained results was judged at the 5% level ($p \leq 0.05$). Data were described using numbers and percent, and means with standard deviation. We assumed the normal distribution of the data. t-test was used to compare means between two groups. Pearson's Chi-square test was used to test for the association between the categories of two independent samples. Mont Carlo exact test and Fishers exact test were used when there were many small expected values.

Ethical consideration

The study was approved by the institutional review board, and ethics committee of the High Institute of Public health, Alexandria University, Egypt. The study conformed to the international research guidelines and the revised Helsinki Declaration of Bioethics. All participants were informed about the aims and concerns of the study and were assured about the confidentiality, protection and anonymity of their data and that their responses would be kept confidential and their identities would not be revealed in research reports or in the publication of findings. Informed consent was voluntarily obtained from all participants.

RESULTS

Sociodemographic characteristics of the study population

The study included 552 participants; 90.0% males and 10.0% female. Almost half of the sample (46.7%) were in the age group 20-<40 years with a mean age of 34.7±15.8. The majority of the participants (74.1%) were urban residents, married (60.5%), of high literacy (73.7%), and working (73.7%). High, middle and low socioeconomic classes were almost equally presented among the participants (Table 1). Quitting smoking increased with age (1.5% for ages <20 years and 47.8% for ages 40-75 years). Ex-smokers were more males (86.6%), married (80.6%), of high literacy (71.6%), urban residents (71.6%), working (79.1%), of low to moderate socioeconomic level (38.8% each), not smoking other than cigarettes (58.2%), and not abusing drugs or alcohol (95.5%).

Life style and behaviors

About 87.9% of the enrolled smokers were current smokers and 12.1% were ex-smokers. About 42.8% were classified as heavy smokers and the majority of the studied smokers were also exposing to passive smoking (68.5%). The onset of smoking was more frequent at teenage and adolescence (10-<20 years of age). Most of them were classified as heavy smokers and more than one half (54.2%) were smoking other forms of tobacco including water pipe (95.3%) and smokeless tobacco (1.7%). Alcohol and substance abuse were reported by 3.2% and 17.9% of the participants respectively (Table 2).

Smoking cessation history

Utmost 28.1% of the participants admitted having the intension to quit smoking of which 86.0% were confident and ready to set a date to quit. Almost two thirds of the sample (61.1%) had an actual quitting attempt. The number of quitting trials was more frequently once (27.9%) and mounted to 5 times and more among 9.8% of the participants. The time elapsed since the last attempt to quit smoking was variable and ranged between

Table 1: Socio-demographic characteristics of the studied smokers.

Socio-demographic characteristics	Studied subjects (n=552)		current smoker (n=458)		ex-smoker (n=67)		sig. test P value
	No.	%	No.	%	No.	%	
Age (years)							
Less than 20	88	15.9	87	98.9	1	1.1	X^2=12.5 **P=0.002**
20-<40	258	46.7	224	86.8	34	13.2	
40-	206	37.3	174	84.5	32	15.5	
Min-Max	11.0-75.0						t=-3.2 **p=0.002**
Mean±SD	34.4±15.6		34.7±15.6		40.8±14.4		
Gender							
Male	497	90	439	88.3	58	11.7	X^2=1.1 P=0.31
Female	55	10	46	83.6	9	16.4	
Residence							
Urban	409	74.1	361	88.3	48	11.7	X^2=0.23 P=0.63
Rural	143	25.9	124	86.7	19	13.3	
Marital status							
Single	178	32.2	166	93.3	12	6.7	X^2=12.8 **P<0.0004**
Married	334	60.5	280	83.8	54	16.2	
Widow/divorced	40	7.2	39	97.5	1	2.5	
Educational level							
Illiterate	34	6.2	30	88.2	4	11.8	X^2=0.17 P=0.67
Read and write	35	6.3	30	85.7	5	14.3	
Primary school	32	5.8	27	84.4	5	15.6	
Preparatory school	44	8	39	88.6	5	11.4	
Secondary school	136	24.6	108	79.4	28	20.6	
University education	271	49.1	251	92.6	20	7.4	
Occupation							
Not work	145	26.3	132	90.4	14	9.6	X^2=1.2 P=0.293
Retired	33	6.0	31	93.9	2	6.1	
Disabled	1	0.2	0	0	1	100	
Work	407	73.7	353	86.9	53	13.1	
Work full time	297	53.8	270	90.9	27	9.1	
Work part time	110	19.9	84	76.4	26	23.6	
Socioeconomic class							
High	169	30.6	148	85.1	26	14.9	X^2=2.9 P=0.22
Middle	209	37.9	183	87.6	26	12.4	
Low	174	31.5	154	91.1	15	8.9	

Table 2: Life style and Behaviors among the studied smokers.

Life style and Behaviors	Studied subjects (n=552)		current smoker (n=458)		ex-smoker (n=67)		sig. test P value
	No.	%	No.	%	No.	%	
Smoking Status							
Current smoker	458	87.9					
Ex-smoker	67	12.1					
Passive smoking							
No	174	31.5	148	85.1	26	14.9	X^2=1.8 P=0.17
Yes	378	68.5	337	89.2	41	10.8	
Age at start smoking							
<10 years	81	14.6	73	90.1	8	14.0	X^2=3.3 P=0.34
10- <20 years	236	42.8	212	89.8	24	10.2	
20-30 years	156	28.3	136	86.1	22	13.9	
> 30 Years	77	13.9	64	83.1	13	16.9	

Smoking index							
Light smokers	136	24.6	120	88.2	16	11.8	
Moderate smokers	180	32.6	159	88.3	21	11.7	X^2=0.13 P=0.94
Heavy smokers	236	42.8	206	87.3	30	12.7	
Smoking other than cigarette							
Never	253	45.8	214	84.6	39	15.4	
Yes Frequent	94	17	85	90.4	9	9.6	X^2=4.7 P=0.099
Yes Infrequent	205	37.1	186	90.7	19	9.3	
Type of other smoking [n=299]							
Water Pipe	294	98.3	266	90.5	28	9.5	X^2=0.52 P=0.46
Smokeless Tobacco	5	1.7	5	100.0	0	0.0	
Drug and alcohol use							
Cannabis							
Yes	73	13.2	72	98.6	1	1.4	**X^2=9.1 P=0.002**
No	479	86.8	413	86.2	66	13.8	
Opium							
Yes	3	0.54	3	100.0	0	0.0	X^2=0.42 P=0.52
No	549	99.5	482	87.8	67	12.2	
Tamol/Tramadol							
Yes	23	4.2	22	95.7	1	4.3	X^2=1.4 P=0.24
No	529	95.8	463	87.5	66	12.5	
Alcohol use							
Never	533	96.5	468	87.8	65	12.2	X^2=1.8 P=0.40
Yes Frequent	3	0.54	2	66.7	1	33.3	
Yes Infrequent	16	2.9	15	93.8	1	6.2	

one week or less to 5 years and more with a preference to longer periods [>6 months - 1 year (17.4%), 1-<5 years (20.8%), longer than 5 years (10.1%)]. The longest period of time spent without smoking since onset of smoking ranged between one week or less to 5 years and more with a preference to shorter periods [One week or less (12.9%), One week - <1 Month (20.3%), >1 month - 6 months (11.1%)]. About 28.6% of the study participants experienced quitting smoking for more than 24 hours only once whereas doing this 2-4 times and 5 times and more were experienced by 22.7% and 9.4% respectively. The majority of the studied smokers were encouraged to stop smoking by their parents (65.6%) or other family members (71.7%) but less frequently by friends (24.5%) or workmates (16.3%). More than half of the participants were somewhat/a little confident that they will succeed if they decide to quit smoking completely, during the next two weeks. The most frequently tried method to quit smoking was cold turkey (23.4%), gradual reduction (15.9%), and NRT (12.5%). About 67.4% found the used method very useful (Table 3). Trying to quit smoking did not differ significantly by gender, residence, education or socioeconomic standard, age onset of smoking, smoking other than cigarettes or passive smoking but increased with younger age, being working and among those not abusing drugs or alcohol, having the intension to quit, having social support, had received an advice to quit from a health care provider (HCP), and having low dependence score (p<0.05) (Table 4).

Table 3: Smoking cessation history among the studied smokers.

Smoking cessation	Studied subjects (n=552)	
	No.	%
Have the intension to stop smoking		
No	109	19.7
Not sure	288	52.2
Yes	155	28.1
Ready to set a date to quit smoking		
No	421	76.3
Yes	131	23.7
If you were to try to stop smoking, how confident would you be about succeeding		
Not willing to try	109	19.7
Very confident	133	24.1
Fairly confident	204	37.0
Not confident	106	19.2
Tried to quit smoking before		
No	215	38.9
Yes	337	61.1
Number of times tried to stop smoking		
Never	215	38.9
Once	154	27.9
2-4 times	129	23.4
5 times or more	54	9.8
Timing of last attempt to stop smoking		
Never	215	39.9
One week or less	6	1.1
1 week - 1 month	16	2.9

Reasons of difficulty to quit smoking among the studied smokers

The drive to quit smoking was an advice of a family member (39.9%) or a doctor (30.1%) and to a lesser extent was the

>1 month - 6 months	48	8.7
>6 months - 1 year	96	17.4
1-<5 years	115	20.8
Longer than 5 years	56	10.1
The longest period of time spent without smoking since you first started smoking regularly		
Never	208	37.7
One week or less	71	12.9
1 week - 1 month	111	20.3
>1 month - 6 months	61	11.1
>6 months - 1 year	28	5.1
1-<5 years	51	9.2
Longer than 5 years	22	4.0
Feel hard to quit smoking		
Don't want/not sure to quit	120	21.7
No	107	19.4
Yes	325	58.9
Methods tried to quit smoking		
Never tried	215	38.9
Clinic or group	15	2.7
Written materials (self-help pamphlet)	10	1.8
Cold Turkey (individual counseling)	129	23.4
Gradual reduction	88	15.9
Special filters	18	3.3
Stop with a friend (buddy system)	33	6.0
Hypnosis	2	0.4
Acupuncture	1	0.2
Self-help program	24	4.3
Support group	15	2.7
Nicotine gum	35	6.3
Nicotine patch	28	5.1
Nicotine inhaler	6	1.1
Degree of usefulness of the method [n=337]		
Very useful	207	67.4
Fairly useful	58	17.2
Not useful at all	52	15.4

Table 3: Smoking cessation history among the studied smokers [CONT].

Smoking cessation	Studied subjects (n=552)	
	No.	%
The drive to quit smoking		
Never	215	38.9
Advice from a doctor	166	30.1
Advice of a family member	220	39.9
Having young children in household	29	5.3
Financial problems	70	12.7
Worried about smoking hazards	109	19.7
Worsen health conditions	12	2.2
Cause of starting smoking again		
NA	235	42.6
Craving to smoke became too strong	172	31.2
To cope with pressure and stress	163	29.5
At a party or social situation	49	8.9
Frequency of quitting smoking for more than 24 hours		
Never	215	38.9
Once	158	28.6
2-4 times	125	22.7
5 times or more	52	9.4
Family members encouraging trying to stop smoking		
Partner	362	65.6
Other family members	396	71.7
Friends	135	24.5
Workmates	90	16.3
If you decide to quit smoking completely, during the next two weeks, how confident are you that you will succeed?		
Strongly	190	34.4
Somewhat/ A little	291	52.7
Not at all	71	12.9

Table 4: Quitting attempt in relation to smokers' characteristics.

		Quitting Attempt				sig. test P value
		No		Yes		
		No.	%	No.	%	
Age in years	<20	17	19.3	71	80.7	**X^2=19.3 P<0.0001**
	20-	118	45.7	140	54.3	
	40-75	80	38.8	126	61.2	
Gender	Male	190	38.2	307	61.8	X^2=1.1 P=0.29
	Female	25	45.5	30	54.5	
Residence	Urban	158	38.6	251	61.4	X^2=067 P=0.795
	Rural	57	39.9	86	60.1	
Marital status	Not married	75	34.4	143	65.6	X^2=3.1 P=0.077
	Married	140	41.9	194	58.1	
Educational level	Low literacy	58	40.0	87	60.0	X^2=0.91 P=0.76
	High literacy	157	38.6	250	61.4	
Working status	Not working	46	31.5	100	68.5	**X^2=4.6 P=0.032**
	Working	169	41.6	237	58.4	
Socio economic level	Low	71	40.8	103	59.2	X^2=1.2 P=0.545
	Moderate	84	40.2	125	59.8	
	High	60	35.5	109	64.5	
Age onset of smoking	1-<10yrs	32	39.5	49	60.5	X^2=1.9 P=0.593
	10-<20yrs	92	39	144	61	
	20-30yrs	66	41.8	92	58.2	
	>30yrs	25	32.5	52	67.5	
Smoking Index	Mild	48	35.3	88	64.7	X^2=3.2 P=0.20
	Moderate	65	36.1	115	63.9	
	Heavy	102	43.2	134	56.8	
Passive smoking	No	62	35.8	111	64.2	X^2=1.0 P=0.31
	Yes	153	40.4	226	59.6	
Smoking other than cigarettes	No	89	35.2	164	64.8	X^2=2.8 P=0.095
	Yes	126	42.1	173	57.9	
Drug/Alcohol abuse	No	163	36.5	284	63.5	**X^2=6.1 P=0.014**
	Yes	52	49.5	53	50.5	
Intention to quit smoking	No	98	89.9	11	10.1	**X^2=176.4 P<0.0001**
	Not sure	102	35.4	186	64.6	
	Yes	15	9.7	140	90.3	
Advice of a HCP to quit	Yes	20	12.0	146	88.0	**X^2=72.2 P<0.0001**
	No	195	50.5	191	49.5	
Social support	Yes	162	33.7	319	66.3	**X^2=43.7 P<0.0001**
	No	53	74.6	18	25.4	
Fagerström Smoking Dependence score	Low	55	34.8	103	65.2	**X^2=10.5 P=0.005**
	Medium	91	35.3	167	64.7	
	High	69	50.7	67	49.3	

smokers' concerns about smoking hazards (19.7%) or due to financial limitations (12.7%). The studied smokers found quitting smoking difficult either because they enjoy smoking too much (59.2%), they do not think that they have enough willpower (69.0%), they would be too stressed (80.1%), they would miss smoking with friends (55.8%), they cannot resist the craving for a cigarette (76.1%), they do not really want to quit (56.2%), they would be bored (70.8%), they would miss smoking breaks at work (53.8%), or that the withdrawal symptoms would be unpleasant for them (51.4%). The studied smokers were not confident to stop smoking when they first get up in the morning (44.2%), when they are very anxious and stressed (53.3%), over coffee while talking and relaxing (43.8%), or when they are very angry about something or someone (43.8%). However, they were somewhat confident in different situations most probably with friends at a party (47.1%), when they feel that they need a lift (48.6%), when they realize that they have not smoked for a while (46.0%), or with their spouse or a close friend who is smoking (46.0%). About one third of the smokers tried to advise (34.4%) and help other smokers to stop smoking (27.5%). Motivation to quit smoking was significantly related to the presence of social support (p<0.05) (Figure 1).

Fagerström Scoring Scale for Smoking Dependence among the Studied Smokers

Almost half of the sample (46.7%) achieved a medium Fagerströmscore for smoking dependence and about 24.6% achieved a high one (Figure 2). Smoking dependence was not related to educational level, marital status, socioeconomic level, passive smoking or smoking other than cigarettes. However, it was significantly associated with age (76.1% of smokers younger than 20 years had a medium score); gender (48.5% and 26.4% of males had medium and high scores respectively); residence (53.2% of urban residents had a medium score); working status (54.5% of unemployed had a medium score); and alcohol or drug use (54.5% of those abusing substance or alcohol had a medium score). Motivation to stop smoking was associated with low dependence score. In our logistic regression model, male gender was the single predictor of smoking dependence (Table 5).

The majority of smokers who did not find it difficult to quit (66.7%) and almost half (47.7%) of those who found to be motivated to stop smoking, had low dependence scores (p<0.0001). However, the majority of those who tried to quit (49.6%) had a medium dependence score (p=0.004). Counseling as a method for smoking cessation was adopted by those who were most tobacco-dependent (p=0.018).This method was also associated with higher numbers of attempts (p=0.008) (Figure 3).

DISCUSSION

The Global Adult Tobacco Survey (GATS) [16] in Egypt is a nationally representative household survey of men and women aged 15 years and above. It is designed to produce internationally comparable data on tobacco use and tobacco control measures using a standardized questionnaire and provides information on tobacco use, cessation, second-hand smoke, economics, media, and knowledge, attitudes and perceptions towards tobacco. However, data on smoking dependence were lacking in that survey. In the present study, we report the motivations and barriers towards smoking cessation and the status of smoking dependence among a sample of smokers residing in urban and rural societies in Egypt. We used a quantitative measure of dependence "the Fagerström test for nicotine dependence", which had proved to be successful in predicting the outcome of attempts to quit smoking.

Our data were consistent with GATS regarding the sociodemographics, the life style and behaviors of the smokers. In the current study, more than one half of the participant smokers were smoking other forms of tobacco including water pipe "Shisha" (95.3%) and smokeless tobacco (1.7%). Approximately 3.3% of the Egyptian population are current shisha smokers (6.2% of men and 0.3% of women). Overall, 3.3% of adults aged 15 years and over smoked shisha and about 2.6% smoked smokeless tobacco [16]. This warns the urgent need for community health education programs to raise the public awareness about the dangers of shisha smoking and smokeless tobacco products. GATS and the results of the current study clearly show that smokeless tobacco is used. These data will serve as a baseline in Egypt to be used to monitor the initiation of other new tobacco products by the tobacco industry.

Whether a smoker succeeds in stopping smoking depends on the balance between that individual's motivation to stop smoking and his/her degree of dependence on tobacco. Motivation is important because medications to assist with smoking cessation will not work in smokers who are not highly motivated. Dependence is especially important in smokers who do want to stop smoking, as it influences the choice of intervention [17]. Previous studies stated that75%–85% of smokers would like to stop [18]. Among all current U.S. adult cigarette smokers, nearly 68.0% reported in 2015 that they wanted to quit completely [19,20]. In GATS report, 42.8% of current cigarette smokers stated they were interested in quitting. In the present study, utmost 28.1% were motivated to stop smoking and 52.2% were not sure. Ex-smokers were more likely to be males, married, of high literacy, urban residents, working, low to moderate socioeconomic level, not smoking other than cigarettes (58.2%), and not abusing drugs or alcohol (95.5%). This agrees with a study conducted in Switzerland, where male gender (OR=0.43, p<0.01), lower alcohol consumption (OR=0.90, p=0.05) and a lower number of cigarettes smoked per day at baseline (OR=0.87, p<0.01) predicted smoking abstinence [21].

In the present study, approximately two thirds of smokers reported a quit attempt. This was quite higher than reports from GATS (41.1%) [16] and USA (43.5%) [22] and (53.8%) [20], but similar to reports from Turkey (60.0%) [23] and Canada (67.0%) [24]. In the later, the most common reasons given for quitting smoking were concern over health (91%), expense (60%), concern about exposing others to secondhand smoke (56%), and motivation to set a good example for others (55%). This differs to an extent with the present results where the drive to quit smoking was most probably an advice of a family member or a doctor and to a lesser extent smokers' concerns about smoking hazards or due to financial limitations. According to the trans theoretical model, smokers who fix their attempts to quit well in advance increase their chances of success. Thus, in an assisted

Table 5: Predictors of Fagerström Sore for Smoking Dependence and its Correlation with some of smokers' characteristics.

Socio-demographic characteristics	Score of Fagerström Scale for Smoking Dependence				
	r	P	Beta	t	P-vale
Age (years)	0.067	0.118			
Gender (male/female)	**-0.239**	**0.0001**	**-0.226**	**5.350**	**<0.0001**
Residence (urban/rural)	**0.118**	**0.006**	0.064	1.450	0.148
Marital status (not married/married)	0.009	0.840			
Educational level (basic education or less/ higher than basic education)	**-0.132**	**0.002**	0.040	0.950	0.342
Occupation (not work/work)	**0.089**	**0.036**	-0.074	1.682	0.093
Passive smoking (no/yes)	-0.071	0.098			
Constant			**-**	**9.259**	**<0.0001**

r: Spearman Rho correlation coefficient
Regression model: F=11.535, P<0.0001, Adjusted R Square: 0.071

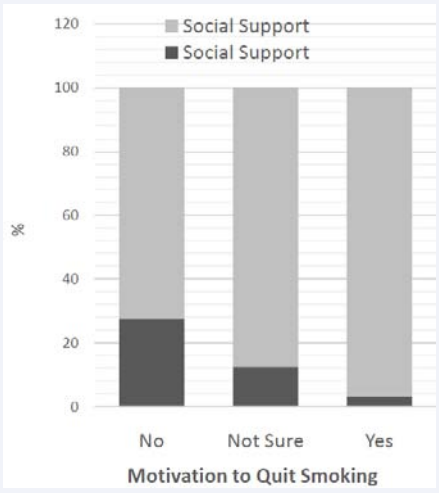

Figure 1 Motivation to quit smoking in relation to social support.

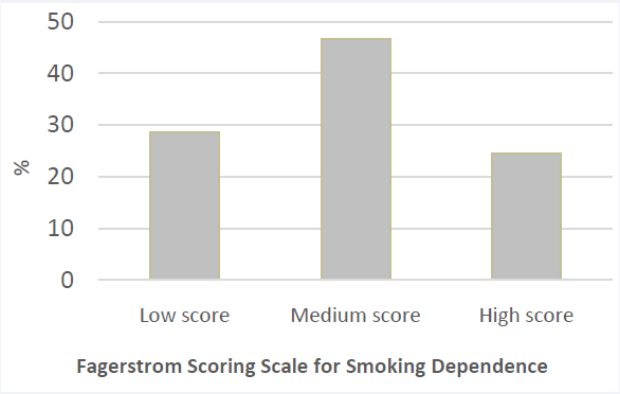

Figure 2 Fagerström Scoring Scale for Smoking Dependence among the studied smokers.

smoking-cessation program, the motivation to quit should be the prerequisite to engage in a smoking cessation attempt [18].

In line with the GATS, trying to quit smoking did not differ significantly by gender, residence, education or socioeconomic standard, age onset of smoking, smoking other than cigarettes or passive smoking but increased with younger age, being working and among those not abusing drugs or alcohol, having the intension to quit, having social support, received advice to quit from an HCP, and having low dependence score. This differed from a study conducted by Shiffman et al. [22], who found that less-educated smokers and men were less likely to have made a quit attempt. Moreover, they also found that the most-dependent smokers were least likely to attempt to quit, which is not consistent with our finding where the moderately dependent smokers reported more trials for smoking cessation. In a study conducted in China, Zhao et al., found that being advised to quit by a HCP, lower cigarette cost per pack, monthly or less frequent exposure to smoking at home, and awareness of the harms of tobacco use were significantly associated with making a quit attempt [25]. Hence, it is important for HCPs to provide patients who smoke with information on the harms of tobacco use and to give a cessation advice. In agreement with our results, the later study found no association between smoker's educational level or nicotine dependency and making a quit attempt. In the present study, trials to quit was significantly associated with younger age groups (<20 years). In fact, many of young smokers aging<20 years may still be experimenting with smoking, thus are less nicotine dependent and thus are more likely to quit. Unlike our results, Yong et al., found that smoking cessation was affected by frequent exposure to others smoking at work or living at homes that permitted smoking [20].

The importance of the work setting in influencing smoking habits and facilitating smoking cessation is well established [26]. In the present study, workers were more likely to make quit attempts. In USA, quit interest was less likely among workers with long work hours, but more likely among workers with job insecurity, or frequent workplace skin and/or respiratory exposures [20]. Many workers smoke tobacco for its perceived stress-reducing properties and benefit in improving work performance under stress [27]. However, smoking is perceived by unemployed as a stress buffering method for psychosocial factors such as the inability to control important matters in life and emotional isolation mediated by unemployment [28]. Such issues may need to be addressed in workplace smoking cessation programs.

Research in some other countries indicates a lack of association between socioeconomic class and quit attempts [29] although Gorini et al., in his study of the socioeconomic

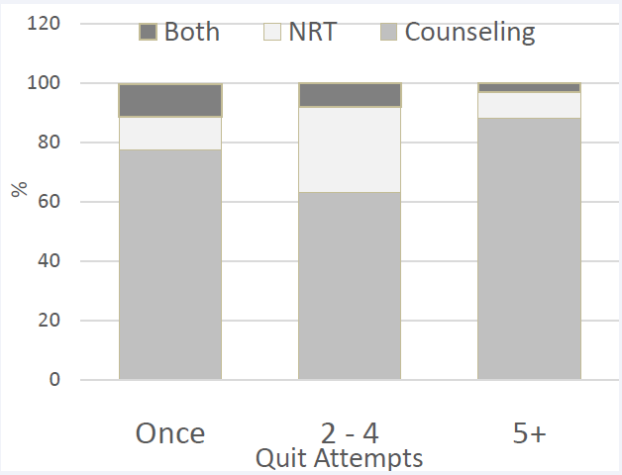

Figure 3 Number of attempts to quit smoking in relation to the method used for quitting.

disparities in quitting smoking found that smokers with fewer years of education were less likely to quit [30]. In support to our findings, data from the from the Tobacco Use Special Cessation Supplement to the Current Population Survey (TUSCS) conducted in 2003 in USA suggested that nicotine dependence plays a role in quitting behaviors among young adult daily smokers; although socio-demographic factors appear to be more important among non-daily smokers [31].

It has become increasingly evident that reversions to smoking may occur very early in many quitting attempts, i.e, within hours or days after the quit day [18]. In the current work, the longest period of time spent without smoking since the onset of smoking ranged between one week or less to 5 years and more with a preference to shorter periods. In some studies, people who quit on their own, approximately one-third to one-half smoke within a few days and about 50%–60% smoke within the first 2 weeks. Early relapse is also common among participants who receive smoking cessation treatments [18]. This was not true in the present study as counseling alone or combined with nicotine replacement treatment (NRT) were significantly associated with shorter periods of quitting; probably because the cold turkey was the most frequently used counseling method. This was supported by previous findings that 85% of self-quitters experienced an early relapse [18]. A revision of the counseling methods adopted in clinics and tobacco control program in Egypt is therefore warranted.

A wide variety of cessation treatment for nicotine dependence is commercially available, yet only two general approaches have received empirical validation: behavioral intervention (including 5 as brief intervention) and pharmacotherapy particularly the NRT (i.e., transdermal patch, gum, inhaler, nasal spray, and lozenge) [32,33]. In the present report, behavioral therapy particularly individual counseling was more common than pharmacotherapy. In the GATS report, 2.0% of smokers used pharmacotherapy, 4.0% used counselling or advice, and 93.9% used none of these methods. In UK, Lancaster et al. [34], found that very few smokers who tried to quit used behavioral treatment, and many who did used self-help materials, which were of limited utility. In USA, approximately 43.5% of smokers reported a quit attempt in the preceding year, where 64.2% of attempters used no cessation treatment; 8.8% used behavioral treatment; 32.2% used medication; and 14.1% used more than one treatment. Social support was reported to have been received by 24.1%. Unlike our results, more nicotine-dependent smokers were more likely to use medications (OR=3.58; 95% CI=3.04–4.20). Counseling, which has demonstrated efficacy, was used in less than 5% of quit efforts [22].

In the present study, counseling method was significantly associated with higher numbers of attempts. This agrees with reports from clinical trials, where it was difficult to quit smoking without medication, and use of medication reverses this liability [35], suggesting that cessation treatment may be used by those who need them most. Still, even among the most-dependent smokers, only a minority used medications to help them quit. A combination of behavioral and pharmacologic treatment is thus regarded as the gold standard for smoking cessation [36].

In our study cohort, social support was significantly associated with motivation to quit smoking and success in smoking cessation. This disagrees with Shiffman et al. [22], who found that social support was not associated with smoking abstinence and did not show the inverse association resulted when using cessation medications.

Emerging evidence suggests that it is not just the severity or intensity of nicotine withdrawal or the method adopted for smoking cessation that predicts early smoking relapses, but also how an individual responds to discomfort and distress [37]. This agrees with our results since the most important stated reasons for difficulty to stop smoking were feeling stressed, bored, and absence of will power. Baker and co-workers highlighted the role of low psychological distress tolerance in favoring early relapses, hypothesizing that negative affect is the “motivational core” of the withdrawal syndrome [38].

CONCLUSION AND RECOMMENDATIONS

Cessation support services in Egypt need further strengthening. Although there are cessation clinics available in Egypt, they are not as effective as hoped for as no nicotine replacement therapy is offered. It is important to raise awareness of the harms of tobacco use, to emphasize HCPs’ delivering cessation advice, and to promote smoke-free homes and workplaces to increase successful quit attempts. It is encouraging that moderate and low nicotine dependency level is prevailing and that over 60% of smokers try to quit. However, more is needed to encourage successful quit attempts and pharmacotherapy is crucial for proper management. Further understanding of the potential indirect paths of smoking cessation could help tailor the appropriate interventions that consider individuals’ motives. Nicotine dependence was significant at younger ages. Therefore, smoking cessation program should be a top priority and targeted to prevent smoking in adolescence.

STUDY LIMITATIONS

The present study was limited by the use of a cross-sectional design, thus the results cannot be interpreted as causal. The survey was also vulnerable to bias due to reliance on recall. In

particular, past quit attempts are easily forgotten, particularly as many are undertaken spontaneously, and many are short-lived.

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