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Quality and Physician-Related Factors of Practice in Smoking Cessation Counseling in Primary Healthcare in Jeddah, Saudi Arabia

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Abstract: **A cross-sectional study was carried out in a random selection of 10 primary healthcare centers (PHC) to assess level of practice in smoking cessation counseling (SCC) among physicians in Jeddah, Saudi Arabia as well as physician-related factors interfering with appropriate practice. Level of practice was assessed using the 5-A's & 1-R (Ask, Advise, Assess, Assist, Arrange, and Reiterate) counseling strategy with calculation of a practice score (PS: 6-30). Appropriate practice in SCC was defined as PS ≥24. A 5-attitude dimensions model was used to assess physician-related factors of SCC, including physicians' motivation, confidence, perceived health risks of smoking and benefits of smoking cessation, perceived benefits to physician, and perceived patient's attitude. On each dimension, a score was calculated and analyzed as factor of practice in addition to demographic and professional factors and physician's smoking status. The study included 92 physicians: 67.4% males; 57.6% aged 20-29 years. The proportion of physicians with appropriate practice was 32.6% (95% CI=23.0, 42.2) which was higher among females, married and older participants with children, as well as in non- and ex-smokers and Family Medicine specialists, by comparison to their counterparts. In the 5-attitude dimension model, confidence and motivation were higher among physicians who had appropriate practice versus the others; while other dimensions had no significant impact. In regression analysis, confidence was the strongest predictor of practice in SCC. The level of practice in SCC in PHC is insufficient, with only one-third of physicians adhering to appropriate counseling strategy, which is principally predicted by physician's confidence.**

Keywords: **Smoking Cessation Counseling, Practice, Confidence, Primary Healthcare, Physician.**

1. INTRODUCTION

Smoking is considered to be one of the most important modifiable risk factors for several cardiovascular and metabolic diseases [1]. The role of primary care physician lies in frontline of preventive strategies of smoking. Many international institutions such as the United States Preventive Services Task Force (USPSTF) recommended that physicians should ask all patients including pregnant women about their tobacco use and advise them to quit smoking. The physicians should also offer to their patients appropriate measures to quit smoking including behavioral therapy and medications [2],[3]. A simplified 5-A's counseling strategy has been largely promoted which consists of the following actions ordered from the least to the most engaged one: 1) "Asking", to identify tobacco users; 2) "Advising", to urge tobacco users to quit; 3) "Assessing" smokers' motivation to quit smoking; 4) "Assisting" the willing smokers by providing appropriate solutions; and 5) "Arranging" the follow-up of the patient [4].

Despite the simplified recommendations, international surveys report unsatisfactory adherence among physicians in engaging smoking counseling with their patients. Several factors intervene in this issue; the most reported were lack of confidence or knowledge among physicians in conducting smoking cessation counseling (SCC) or referring patients to

appropriate services [5]. An Emirati study investigated some correlated factors and found that more than half of the general practitioners (GPs) declared having the skills to help their patients in the smoking issue and two-third of them were not acknowledgeable of the referral community resources [6]. Stead et al, reported other important factors impacting SCC such as the presence or absence of symptoms related to smoking, pregnancy, and heavy smoking and reimbursement of the treatment [5]. In addition to these factors, several studies concord that smoking in physicians may constitute an important obstacle to SCC [7], [8]. Several other negative beliefs were reported among PHC physicians as barriers for appropriate SCC [9].

To appropriately promote SCC among PHC physicians, such factors should be deeply investigated to alleviate all obstacles to the good implementation of further national programs or awareness campaigns.

This study aimed to assess the practice in SCC among PHC physicians, by assessing the percentage of PHC physicians who adhere with the 5 A's counseling strategy. It also investigated physician-related factors interfering with appropriate practice, including physician's demographic and professional factors, smoking status, and various dimensions of physician's attitude towards SCC including confidence, motivation to counsel, perception about smoking-related harms and benefits of smoking cessation, perception about benefits of SCC to physician, and perception about patients' attitude towards SCC.

2. METHODS

A cross-sectional questionnaire-based study was carried out in a random selection of 10 PHC centers in Jeddah, Kingdom of Saudi Arabia from 01 to 31 December 2016. Participants were invited to reply to an anonymous, semi-structured questionnaire which underwent face and content validity and reliability was tested by calculating Cronbach's alpha for all relevant parts. The study protocol, objectives and questionnaire were reviewed and approved by the Medical Research and Studies Department, Directorate of Health Affairs – Jeddah, Ministry of Health.

Assessment of practice in smoking cessation counseling:

Assessment of physician's practice in SCC was based on the 5-A's counseling strategy including an extra item (R=Reiterate). Using a 5-likert type scale (1= never; 5=always), participants were asked to rate their adherence with each of the following actions (5-A's & 1-R): ask patients about their smoking status, advise smokers to quit, assess motivation of smokers to quit, reiterate SCC in next consultations, assist motivated smokers by offering concrete solutions (treatments, referral to specialists, etc.), and arrange a follow-up for patients regarding smoking cessation. A practice score (PS) (6-30) was calculated to assess the level of practice, with higher score indicating better practice in SCC. Analysis of reliability of this part of the questionnaire (6 items) showed a Cronbach's Alpha=0.845.

Assessment of physician-related factors of practice in smoking cessation counseling:

In 1984, Wells et al. developed a 4-dimension conceptual model of physician's attitude regarding SCC [10]. This model structured the physician-related factors that influence completeness of SCC as follows: a) physicians' motivations to counsel b) perceived health risk of smoking, c) perceived skills in counseling, and d) perceived costs and benefits to the physician of counseling. Based on Wells' model and literature review, authors adapted a 5-attitude dimension model including "perceived patients' attitude toward SCC" as an additional dimension to the 4 dimensions previously described by Wells. Thus, the conceptual model used in the present study included the following 5-attitude dimensions presented in Figure 1:

1) Physicians' motivation to SCC (5 items; reliability test: Cronbach's alpha=0.926)

2) Perceived skills or confidence in SCC (10 items; Cronbach's alpha=0.940)

3) Perceived health risk of smoking and benefits of smoking cessation (10 items; Cronbach's alpha=0.672)

4) Perceived benefits to the physician of SCC (6 items; Cronbach's alpha=0.702) and

5) Perceived patient's attitude towards SCC (7 items; Cronbach's alpha=0.789)

Scores were calculated on each dimension and analyzed in correlation with clinical practice. Items within each dimension were adapted from literature to fit the study population characteristics.

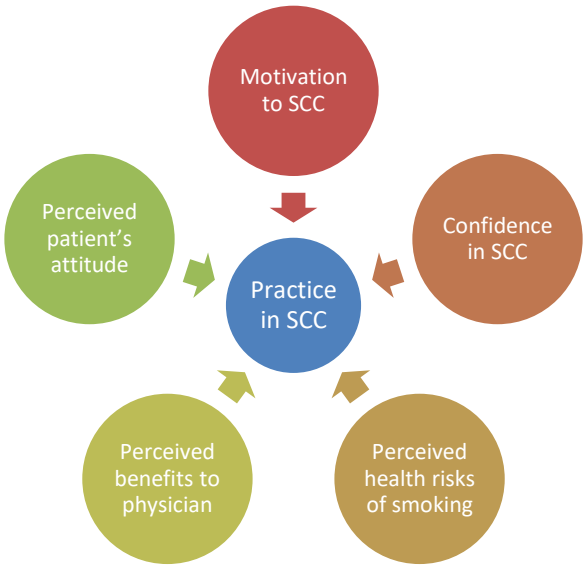

Fig 1: Conceptual model of physician-related factors associated with smoking cessation counseling

Further demographic and professional factors such as age category, gender, years of practice, and specialty; as well as smoking status and history of quit attempts were collected and analyzed as factors of practice in SCC.

Sampling:

Primary healthcare physicians were recruited using a stratified two-stage cluster sampling method [11]. Jeddah was stratified into 5 primary healthcare sectors; each sector contains 7 to 13 centers. Within each sector, 2 primary care centers (clusters) were randomly selected. Within each center, all physicians who were present at the days of the interview were recruited using a convenience sampling. Target sample size (N=200) was calculated for a 95% confidence interval and 80% statistical power to detect an estimated 15.3% of estimated proportion of physicians who always assist their motivated patients to quit smoking by conducting an appropriate SCC, the outcome of interest [3].

Statistical Analysis:

Statistical analysis was performed with the Statistical Package for Social Sciences version 21.0 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive statistics were carried out to present demographic and professional factors, as well as the pattern of practice and prescribing in SCC. Categorical variables were presented as frequency and percentage; while numerical variables as mean±standard deviation (SD). Appropriate practice in SCC was assumed for a PS $\geq$ 24; which theoretically corresponds to each of 6 actions (Ask, Advise, Assess, Reiterate, Assist and Arrange) being fulfilled at least usually (6x4=24). According to this cut-off, participants were divided into 2 groups: Group 1: inappropriate practice (score < 24) and Group 2: appropriate practice (score $\geq$ 24). To analyze factors associated with practice in SCC, demographic and professional factors as well as the 5-attitude dimension scores were compared between Group 1 and Group 2, using chi-square test for categorical variables, and independent t-test for numerical variables. Univariate and multivariate models were carried out in binary logistic regression to analyze demographic, professional and 5-attitude dimensions as predictors for appropriate practice in SCC. Results were presented as odds-ratios (OR) [95% CI]. A p-value < 0.05 was considered for statistical significance.

3. RESULTS

Population characteristics:

We included 92 physicians: 67.4% males; 57.6% aged 20-29 years; 67.4% married, 54.3% with children. Majority had 0-5 years of practice (64.1%) in General Medicine (51.1%) or Family Medicine (37.0%). Assessment of physician's smoking status showed that 33.7% were current smokers, among whom 23.9% had history of quit attempts. Participants reported seeing (mean±SD) 17.32±12.02 patients per day; and estimated that 43.81±23.17% of their male patients and 13.44±16.61% of their female patients were smokers. Demographic and professional characteristics of the participants are presented in Table 1.

Table 1: Demographic and professional characteristics of the participants (N=92)

Parameter	Category	Frequency	Percentage
Gander	Male	62	67.4
	Female	30	32.6
Age category (years)	20-29	53	57.6
	30-39	30	32.6
	40-49	9	9.8
Marital status	Single	29	31.5
	Married	62	67.4
	Divorced	1	1.1
Nationality	Saudi	89	96.7
	Non-Saudi	3	3.3
Number of children	Mean, SD [range=0; 10]	1.22	1.57
Parenting	No	42	45.7
	Yes	50	54.3
Years of practice (years)	0-5	59	64.1
	5-10	17	18.5
	10-15	12	13.0
	>15	4	4.3
Specialty	Gen. Medicine	47	51.1
	Family medicine	34	37.0
	Pediatrics	3	3.3
	Ob-gyn	2	2.2
	Int. Medicine	6	6.5
Physicians' smoking status	Never smoked	45	48.9
	Current smoker	31	33.7
	Ex-smoker	16	17.4
History of quit attempts among physicians	None	9	9.8
	1 or 2	13	14.1
	Several times	9	9.8
N. of patients seen per day	Mean, SD; [range=0;60]	17.32	12.02
EPS among patients	Males	43.81	23.17
	Females	13.44	16.61

Gen.Medicine: General Medicine; EPS: estimated percentage of smokers; Int. Medicine: Internal Medicine; SD: Standard deviation;

Assessment of practice in smoking cessation counseling:

Assessment of practice in SCC showed that among 5-A's counseling strategy, actions that were reported to be the most frequently done were "Asking patients about their smoking status" and "Advising smokers to quit", which were reported to be usually or always achieved by 73.9% and 77.2% of the participants, respectively. Other actions including "Assessment of patient's motivation to quit", Assisting motivated patients by offering them concrete solutions" and "Arranging follow-up for patients regarding SCC" were reported to be usually or always done by 51.0%, 52.2% and 30.5% of the participants, respectively. Comparably, only 40.2% reported reiterating SCC to their patients on next re-consultations. Figure 2 shows the percentage of physicians within each level of compliance (never, rarely, sometimes, usually and always) with the different actions in counseling strategy (Ask, Advise, Assess, Reiterate, Assist and Arrange).

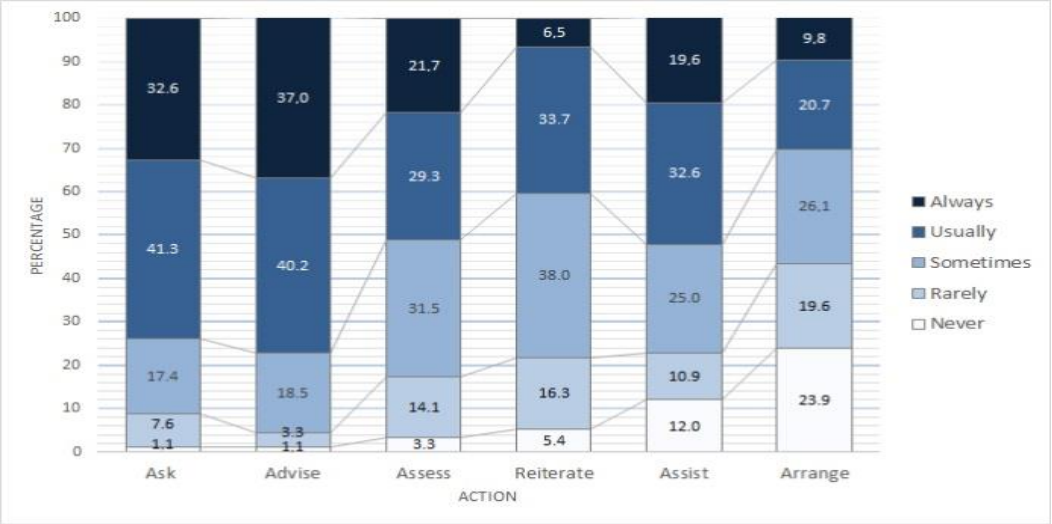

Fig 2: Practice in smoking cessation counseling among primary healthcare physician

The mean±SD PS of the population, which was calculated as the sum of the 6-item scores, 20.87±4.89; range = 7-30; median=22; 75th percentile = 24. The proportion of physicians who had appropriate practice in SCC (PS ≥24) was 32.6% (95% CI=23.0; 42.2%).

Regarding prescribing practice in SCC, 44.9%, 36.0% and 33.7% of the physicians reported that they had already prescribed psychotherapy (behavioral therapy), nicotine replacement therapy (NRT) or Verenicline (Chantix) to help their patients to quit smoking, respectively; however, only 11.2%, 7.9% and 6.7% reported having prescribed bupropion, hypnotics or anxiolytic drugs to smokers, respectively. Figure 3 depicts prescribing practice in SCC among primary healthcare physician.

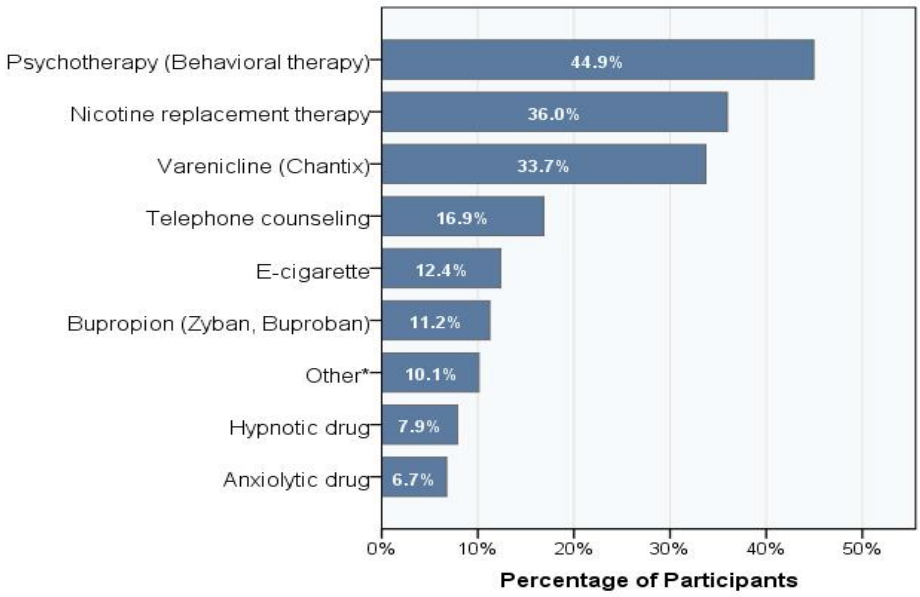

Fig 3: Prescribing practice in smoking cessation counseling among primary healthcare physician

Note: Bars represent the percentage of physicians who reported having already prescribed the given treatment/therapy for patients to help them quit smoking. * Others: health education (2); Seroquel (quetiapine) (1); Seretide (1); Regular gum (1); self-motivation (1); unspecified (4).

Physician-related factors of practice in smoking cessation counseling:

Correlation analysis showed that the proportion of appropriate practice in SCC was higher among participants of female versus male gender (46.7% versus 25.8%; p=0.045), older versus younger age categories (50.0% in 30-39 years and 44.4% in 40-49 years, versus 20.8% in 20-29 years; p=0.017), married versus single (39.7% versus 17.2%; p=0.033), and

those who had children versus those who did not had (46.0% versus 16.7%; p=0.003). Smoking status showed that ex-smokers had the highest rate of appropriate practice (50.0%), followed by non-smokers (37.8%), while current smokers had the lowest proportion with only 16.1% (p=0.037). However, history of quit attempts had no impact on practice in SCC (0.095).

Regarding professional factors, the proportion of appropriate practice was highest among Family Medicine specialists (50.0%), followed by general practitioners (23.4%) and other specialties (18.2%); (p=0.023). Furthermore, physicians who had appropriate practice in SCC reported relatively more patients seen per day and higher percentage of smokers both among their male and female patients, as compared with those who had inappropriate practice; however, these results were not statistically significant.

In the 5-attitude dimension conceptual model, appropriate practice in SCC was associated with higher motivation (mean±SD score=19.77±4.58 versus 15.90±5.54; p=0.001) and confidence (mean±SD score=69.27±18.57 versus 46.53±22.84; p=0.000008) as compared to inappropriate practice, respectively. Other dimensions including perception about smoking health risks and benefits of quitting (p=0.080); perceived benefits of SCC to physician (p=0.073) and perception about patient's attitude towards SCC (p=0.905) showed no significant correlation with practice in SCC. Factors associated with practice in SCC among primary healthcare physicians in presented in Table 2.

Table 2: Factors associated with practice in smoking cessation counseling among primary health care physicians

Factor		Practice level				p-value
		Inappropriate (score<24; N=62)		Appropriate (score≥24; N=30)		
		Freq.	%	Freq.	%	
Gender	Male	46	74.2	16	25.8	.045*
	Female	16	53.3	14	46.7	
Age category	20-29	42	79.2	11	20.8	.017*
	30-39	15	50.0	15	50.0	
	40-49	5	55.0	4	44.4	
Marital status	Single	24	82.8	5	17.2	.033*
	Married or divorced	38	60.3	25	39.7	
Parenting	No	35	83.3	7	16.7	.003*
	Yes	27	54.0	23	46.0	
Num. of children (mean, SD)		0.99	1.66	1.73	1.26	.028*
Years of practice	0-5	44	74.6	15	25.4	.019*
	5-10	12	70.6	5	29.4	
	>10	6	37.5	10	62.5	
Specialty	Gen. Med.	36	76.6	11	23.4	.023*
	Fam. Med.	17	50.0	17	50.0	
	Others	9	81.8	2	18.2	
Physicians' smoking status	Never smoked	28	62.2	17	37.8	.037*
	Current smoker	26	83.9	5	16.1	
	Ex-smoker	8	50.0	8	50.0	
History of quit attempts among physicians	None	7	77.8	2	22.2	.095
	1 or 2	13	100.0	0	0.0	
	Several times	6	66.7	3	33.3	
N. of patients seen per day (mean, SD)		16.21	12.58	19.63	10.61	.202
EPS among male patients		41.63	21.52	48.10	25.96	.215
EPS among female patients		11.00	13.89	17.89	20.19	.078

Factor	Practice level				p-value
	Inappropriate (score<24; N=62)		Appropriate (score≥24; N=30)		
	Freq.	%	Freq.	%	
Motivation to SCC (score: 5-25)	15.90	5.54	19.77	4.58	.001*
Confidence in SCC (score:0-100)	46.53	22.84	69.27	18.57	.000008*
Perception about smoking health risks (score:10-50)	38.06	4.48	39.87	4.76	.080
Perception about benefits of SCC to physician (score:6-30)	20.82	2.94	22.00	2.86	.073
Perception about patient's attitude (score:7-35)	23.21	4.63	23.33	4.64	.905
EPS: Estimated percentage of smokers; SCC: smoking cessation counseling; SD: standard deviation;					

Predictors of appropriate practice in smoking cessation counseling:

In univariate models, binary logistic regression showed that appropriate practice in SCC is predicted by the following demographic factors: female gender (OR [95% CI]=2.52 [1.01; 6.28]; p=0.048); married marital status (OR [95% CI] =3.16 [1.06; 9.37]; p=0.038); 30-39 years age category (OR [95% CI]=3.82 [1.44; 10.13]; p=0.007); number of children (OR [95% CI]=1.38 [1.01; 1.87]; p=0.043) and current smoking status (OR [95% CI]=0.32 [0.10; 0.98]; p=0.046). Professional predictors of appropriate practice in SCC included >10 years of practice (OR [95% CI] =4.89 [1.52; 15.74]; p=0.008) and Family Medicine specialty (OR [95% CI] =3.27 [1.26; 8.49]; p=0.015). In addition, both motivation score (OR [95% CI] =1.16 [1.05; 1.28]; p=0.003) and confidence score (OR [95% CI] =1.06 [1.03; 1.09]; p=0.000133) positively predicted appropriate practice in SCC. In multivariate model, confidence was the only significant predictor for practice (OR [95% CI] =1.06 [1.02; 1.09]; p=0.003). Predictors for appropriate practice in SCC are presented in Table 3.

Table 3: Predictors for appropriate practice in smoking cessation counseling (binary logistic regression)

Predictor		Univariate model				Multivariate model			
		OR	95%CI		p-value	OR	95%CI		p-value
Gender	Female *vs. male*	2.52	1.01	6.28	0.048*	3.23	0.61	16.99	.167
Marital status	Married or divorced *vs. single*	3.16	1.06	9.37	0.038*	0.88	0.10	7.51	.908
Age category	30-39	3.82	1.44	10.13	0.007*	1.33	0.20	8.97	.772
	40-49	3.06	0.70	13.32	0.137	0.02	0.00	1.89	.094
N. of children		1.38	1.01	1.87	0.043*	1.09	0.61	1.94	.774
Parenting	Yes *vs. No*	4.26	1.59	11.39	0.004*	2.73	0.25	30.31	.414
Years of practice (years)	5-10 *(vs. 0-5)*	1.22	0.37	4.04	0.742	0.78	0.09	6.35	.812
	>10 *(vs. 0-5)*	4.89	1.52	15.74	0.008*	29.09	0.93	911.30	.055
Specialty	Family medicine *vs. Gen. Med*	3.27	1.26	8.49	0.015*	1.39	0.34	5.61	.647
	Others vs. Gen. Med.	0.73	0.14	3.88	0.709	2.84	0.26	30.53	.388
Smoking status	Current smoker *vs. non-smoker*	0.32	0.10	0.98	0.046*	0.42	0.06	3.21	.404
	Ex-smoker *vs. non-smoker*	1.64	0.52	5.20	0.395	2.72	0.53	13.90	.228
Motivation to SCC	(Score)	1.16	1.05	1.28	0.003*	1.12	0.97	1.29	.118
Confidence in SCC	(Score)	1.06	1.03	1.09	0.000133*	1.06	1.02	1.09	.003*
Predicted variable=appropriate practice (PS ≥24); OR: odds-ratio; CI: confidence interval; SCC: smoking cessation counseling; *Statistically significant result (p<0.05); Gen. Med: General Medicine.									

Correlation of practice with motivation and confidence:

Linear regression was carried out to analyze the correlation of PS with confidence and motivation scores. Results showed a moderate positive relationship of practice with confidence (r=0.524; OR [95% CI] =1.11 [1.07; 1.15]; p=0.00000) and a weak positive relationship of practice with motivation (r=0.431; OR [95%CI] =1.46 [1.24; 1.73]; p=0.000018) (Figure 4).

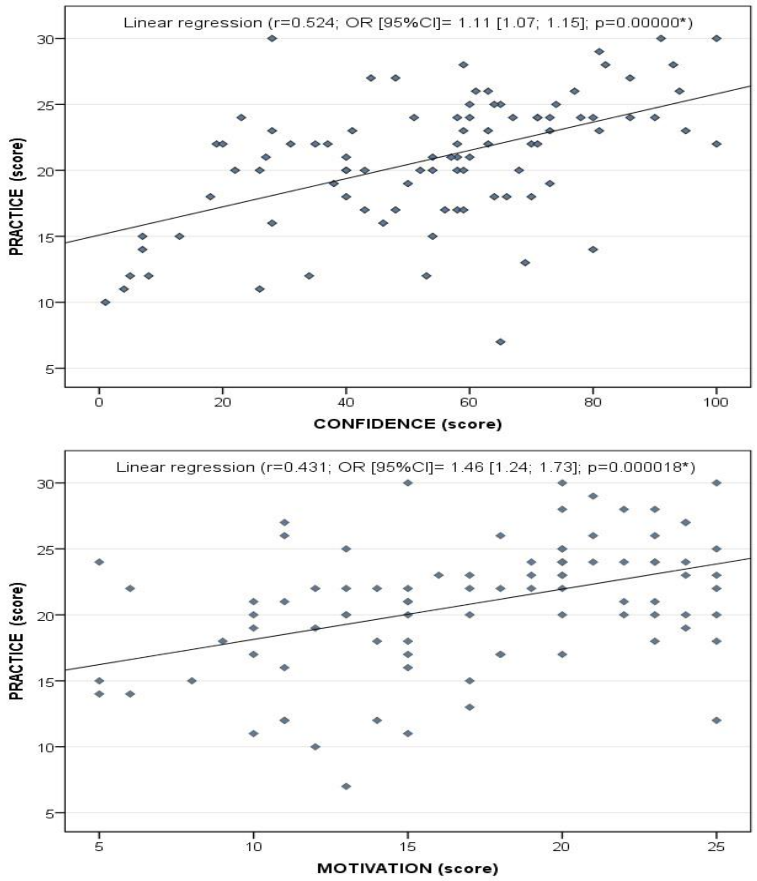

Fig 4: Correlation of practice in smoking cessation counseling with physician's confidence and motivation to counsel

Further, analysis of correlation between motivation and confidence showed a weak positive correlation (r=0.321; OR [95% CI] =1.08 [1.03; 1.13]; p=0.002). (Figure5).

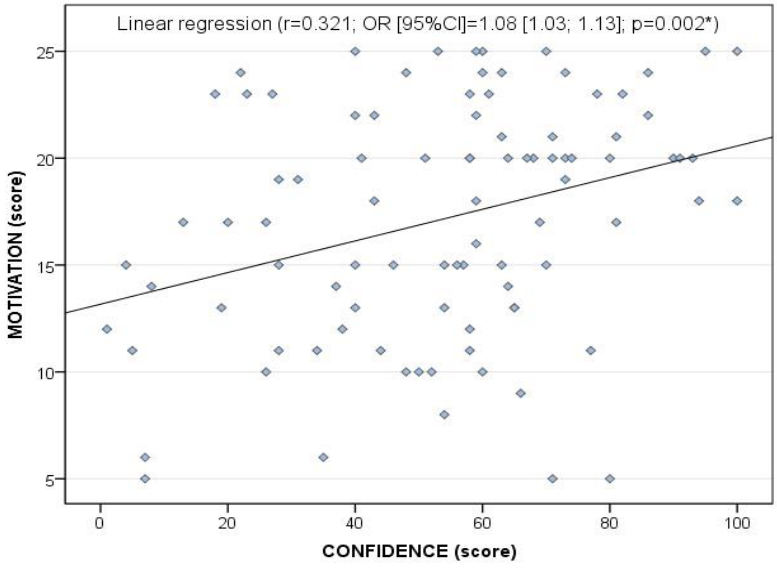

Fig 5: Correlation of motivation to counsel with confidence in smoking cessation counseling among primary healthcare physicians

4. DISCUSSION

This study assessed practice in SCC among PHC physicians and physician-related factors that interfere with appropriate practice and highlighted unsatisfactory level of practice, which is mainly correlated to a low level of confidence among the physicians.

This study showed only one-third (32.6%) of the physicians had an appropriate practice in SCC, which included the 5-A's counseling strategy actions (Ask, Advise, Assess, Assist, and Arrange) in addition to reiteration of SCC in next re-consultations. The cut-off used (≥24) to define appropriate practice was fixed based on the assumption that physician should implement all of the 6 actions at least usually. This cut-off also coincides with the 75th percentile of PS in the population. On the other hand, "Assist", "Arrange" and "Assess" showed low rates of adherence among physicians (30% to 52%, approximately), when taken separately; as compared to "Ask" and "Advise" (approximately 74% to 77%). These results are comparable to the reported literature. A multicenter European study highlighted that, depending on the country, 1% to 63% of the general practitioners (GPs) reported always asking their patients about smoking, resulting in an average of 36% only who always advise their patients to quit smoking [5]. In Jordan, Alolami et al. reported that less than 40% of the family physicians assessed motivation of their patients to quit smoking and less than 30% advised their smoking patients with the counseling options [12]. An Egyptian study reported that 60% of the physicians asked patients regularly about their smoking status; while 36% advised them to quit and only 15.3% assisted them with appropriate counseling [3].

Less than 10% of the participants reported using hypnotic and anxiolytic drugs for smoking cessation; while 11.2% reported using Bupropion. The use of anxiolytics is promoted in smoking cessation for their supposed effect on nicotine withdrawal-induced anxiety; and also to counterbalance the deficit in dopamine and serotonin. However, no reliable evidence of their efficacy have been reported in smoking cessation [13]. The use of hypnotics stands on clinical sense, as nicotine withdrawal characterizing the first period of quitting may be associated with severe episodes of impaired sleep, which increase the risk of relapse and depression [14], [15]. The use of antidepressants such as bupropion and nortriptyline demonstrated improved smoking cessation rates and long-term abstinence; however, their effect in smoking cessation appears to be independent of their antidepressant effect. On the other hand, the use of other antidepressants such as selective serotonin reuptake inhibitors or monoamine oxidase inhibitors showed no efficacy in smoking cessation [16], [17]. Verenicline was used by 33.7% of the participants. It is considered to be one the most efficient smoking cessation treatments which showed particular efficacy in women, where other therapeutic strategies such as bupropion and nicotine replacement therapy were less efficacious than in men. It is associated with more than 50% of abstinence rate [18]. However, concerns have been raised regarding severe adverse effects including suicidal ideation and suicidal behavior as well as some cardiovascular events that have been associated to the use of Verenicline, which have not been confirmed yet by clinical research [19]. In this study, 44.9% of physicians reported having prescribed psychotherapy including behavioral therapy for smoking cessation, which was the most prescribed treatment in the series. While different techniques of behavioral therapy have demonstrated their efficacy in helping patients to quit smoking, it is recommended to combine behavioral therapy with pharmacotherapy to improve success rate [20], [21].

Physician's smoking status was shown to be associated with the level of practice in SCC, with smokers being less prone to adhere to 5-A's & 1-R counseling strategy. This is consistent with findings from other studies. For example, an international telephone survey demonstrated that smoking physicians had a less affirmed perception about both the harmfulness of smoking and the crucial impact of smoking cessation on improving health, and thus were less prone to systematically discuss smoking with their patients [7]. In Canada, Meshefedjian et al. supported smoking GPs, as compared with non- and ex-smokers, were less likely to assess, advise or assist their patients regarding smoking and smoking cessation. On the other hand, Meshefedjian reported that smoking GPs displayed more interest than non or ex-smokers in learning about counseling methods. Ex-smokers were best, qualitatively, to provide the efficient support to their smoking patients [8].

Physician's specialty was also associated with the level of practice with Family medicine specialists being more prone to adhere with the appropriate counseling strategy, as compared with other specialties such as general medicine, pediatrics, etc. Similarly to our findings, Pérez-Stable et al. compared family physicians with pediatricians regarding smoking counseling practice and observed more involvement in family physicians in asking, advising, assisting and arranging actions [22]. In the 5-attitude dimension model, confidence was the most significant factor and predictor of appropriate practice in SCC among PHC physicians, which is probably in relation with a lack of insufficient knowledge and clinical exposure in SCC. In literature, lack of confidence among physicians was reported to be one of the main reasons of

unsatisfactory practice level in SCC [5]. In addition, linear regression showing a positive correlation between motivation and confidence suggests that confidence impacts motivation to counsel among physicians. Alolami et al. reported lack of cessation programs and training for physicians as the 2 major barriers to smoking counseling in the interviewed physicians [12]. This indicates that promoting physicians' confidence to SCC by means of improving their knowledge and clinical exposure would be efficient in prompting their motivation and interest to SCC practice.

The other factors including perception about smoking health risks and benefits of cessation, perception about benefits of SCC to physician and perception about patient's attitude towards SCC showed no impact on practice level. This is in contrast with what was reported in other studies. In Emirates, Awad et al., demonstrated that counseling rate is positively correlated to beliefs and attitudes of the physicians towards smoking cessation [6]. In the series by Pérez-Stable et al., pediatricians in comparison with family physicians reported lacking of SCC skills and frequently believed that their smoking cessation advice would be disregarded by the smoking parents of their patients' [22]. Several other negative beliefs were reported among PHC physicians in relation to insufficient practice in SCC. These included the belief that SCC is time-consuming, ineffective, or unpleasant to patient and a small proportion believed that discussion on smoking and smoking cessation is out of physician's professional responsibility or constitutes an intrusion in the patient's privacy [9].

The main limitation of this study is the small sample size (N=92) that did not reach the target sample size (N=200) because of low participation rate.

5. CONCLUSION

The level of practice in SCC in PHC is insufficient, with only one-third of physicians adhering to appropriate counseling strategy. Adherence to appropriate practice was relatively more prevalent among females, married physicians with children who had >10 years of practice, non- and ex-smokers and those practicing as Family Medicine specialists. Physician's confidence in counseling and motivation to counsel are significant and interrelated factors of practice in SCC. However, confidence showed to be the strongest predictor for appropriate practice. It is crucial to promote physicians' confidence to SCC by means of improving their knowledge and clinical exposure in prompting their motivation and interest to SCC and improve their practice.

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