Research article

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The synergistic effect between Positivity, socio-demographic factors and smoking cessation: results of a cohort study

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Abstract

Objective. To examine the extent to which a effect does exist between Positivity (POS), smoking and socio-demographic factors in determining quitting smoking in subjects participating in a Group Counselling Program (GCP) for smoking cessation.

Methods. 481 subjects were contacted through a telephone call. A logistic regression analysis was carried out. Possible interaction between sociodemographic variables and POS level was tested using the Synergism Index (SI).

Results. For individuals with a POS level over or equal to 3.4 the odds of being smoker was significantly higher among females (OR = 1.55), who smoked at home (OR = 2.16) and lower if there had children at home (OR = 0.53). For individuals with a POS level under 3.4, the only significant variable associated with smoking was being a female (OR = 2.58).

As far concerns the synergistic effect between the variables considered does exist between POS levels and having children at home (SI=1.13) and female gender (SI = 2.8).

Conclusions. The synergistic effect between POS and socio-demographic factors adds evidence on the use of POS as possible determinants of individual happiness. ***Clin Ter 2018; 169(1):e14-17. doi: 10.7417/CT.2018.2048***

Key words: *Positivity, smoking, cessation, happiness*

Introduction

In Italy 22.3% of the entire adult population (11.7 millions of people) are current smokers, according to the Osservatorio Fumo, Alcol e Droga (1). Likely people derive some sort of gratification from smoking. Indeed smokers often claim that quitting smoking can lead to a deterioration in their quality of life, believe that quitting would mean to give up an important source of enjoyment and Happiness (HAP) (2-4). Since HAP states have been associated with reductions in intermediary correlates such as neuroendocrine or inflammatory markers (5) that are strong correlates of smoking (6-7) it has been hypothesized that the impact of smoking cessation on the subsequent health of ex-smokers also may be influenced by changes in HAP levels. Recent studies point to "Positivity" (POS) as a major dispositional determinant of HAP (8). POS is basic a personality trait conducive to facing experience under a positive outlook, staying at the core of self-esteem, life satisfaction and optimism. Recently, Fiedler & West (9) have noticed that enjoyment to smoke was an important predictor of the individual's engagement in quitting smoke. In reality the relations between smoking and HAP are matter of contention since one can exclude that smoking may affect HAP as HAP may affect smoking. Smoking can be a source of HAP as it carries some sort of gratification.

Likewise, HAP can affect smoking and not smoking to the extent they are perceived as instrumental to preserve one's wellbeing. To clarify whether one views HAP as a transitory state of satisfaction or as stable disposition to feel satisfied is crucial to understand the relations between HAP and smoking. Whereas smoking may carry a transitory HAP that compensates a deficient sense of stable HAP, the later one can be a protective factor against smoking. In this regard, it is essential to identify the personality traits that may sustain individual's HAP and the mechanisms through which they operate.

Among stable psychological traits that may foster healthy habits previous findings have pointed POS as a general disposition conducive to facing experience under a positive outlook, staying at the core of self-esteem, life satisfaction and optimism. POS has shown high stability over time and robust associations with a variety of positive outcomes including health.

In a previous study, we investigated the extent to which POS is able to predict relapse after quitting smoking and the desire to smoke again, and showed that POS was significantly and negatively associated with smoking status and craving to smoke (10).

In the present study, we further examine the extent to which a synergistic effect does exist between POS, smoking habits and socio-demographic factors in determining quitting smoking in a group of patients participating in a Group Counceling Program (GCP) for smoking cessation.

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Methods

481 subjects (median age: 55.7±9.9 yrs) who had carried out a 6-week GCP for smoking cessation in the period from 2005 to 2010 at the Teaching Hospital "Azienda Ospedaliero-Universitaria Policlinico Umberto I" in Rome, were contacted through a telephone call. Details of sociodemographic characteristics of the patients are already published (10).

Measures of interest

Happiness and Self-reported Smoking Enjoyment in relation to smoking status. During the telephone interview, the interviewer posited questions about the individuals' current perception of HAP than in the past, particularly on smoking cessation. Subjects were also asked: "how much pleasure derived from smoking". On the basis of their answers, subjects were assigned to two groups: *ex- smokers* and *still-smokers*. *Ex-smokers*: i) subjects non-smokers at previous 1-yr follow-up after the GCP and still non-smokers (n= 206) and ii) subjects smokers at previous 1-yr follow up after the GCP which stopped smoking later (n=38). *Still-smokers* were assigned to 2 subgroups: i) *"Relapsers"*: non-smokers at 1-yr follow up after the GCP, but that started smoking again later (n=54) and ii) subjects smokers at 1-yr follow up and *still-smokers* (n=183). According to Shabab and West (7) both previous group of participant *ex-smokers* (n=244) were asked which of the following statement best applied to them: "I feel happier now than when I was smoking", "I feel about the same now as when I was smoking", "I feel less happy now than when I was smoking", or "I did not know". These questions were addressed also to the group of "*Relapsers"*, to compare their self-reported HAP with when they were non-smokers. *Ex-smokers* subjects were asked: "When you were a smoker, how much pleasure you derived from smoking" with 5 options response: "very much"," quite a bit", "not particularly", "not at all" and "I don't know". The questions: "How much pleasure actually you derive from smoking" with the same 5 options response, were addressed to *still-smokers* to know their smoking enjoyment.

Positivity. To measure POS we used the P-Scale (11). This is a 8-item scale intended to assess POS, that is defined as the tendency to view life and experiences with a positive outlook. The scale is composed by eight items ("I have great faith in the future", "I am satisfied with my life", "Others are generally here for me when I need them", "I look forward to the future with hope and enthusiasm", "On the whole, I am satisfied with myself", "At times, the future seems unclear to me", "I feel I have many things to be proud of", "I generally feel confident in myself"), of which seven are positively worded (e.g. "I feel I have many things to be proud of"), and one was negatively worded (e.g. "At times, the future seems unclear to me"). Participants were asked to provide their ratings using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha of the eight-item scale was 0.78.

The Local Ethical Committee (Policlinico Umberto I- Sapienza University of Rome) approved the study protocol.

Statistical analysis

Differences between groups were tested using chi square and Student's t tests. In order to find a cut-off of the POS level that predicts the probability of being smoker or not, a ROC curve analysis was conducted. The value of cut-off was chosen considering the maximum of the sum of sensibility and specificity.

A logistic regression analysis was carried out considering the following variables: age, gender, presence of children at home; presence of smokers at home. The results are presented as Odds Ratio (OR) and 95% Confidence Intervals (95%CI). The analysis was carried out considering the POS level as an effect modifier.

Moreover, the possible interaction between sociodemographic variables and POS level was tested using the Sinergism Index (SI), calculated as follows: $S = [OR_{11} - 1]/([OR_{01} + OR_{10}]- 2)$, where OR_{11} is equal to OR of the joint effect of two risk factors and OR_{10} and OR_{01} are equal to OR of each risk factor in the absence of the other. A value of S equal to unity was interpreted as indicative of additivity, whereas a value greater than unity was indicative of superadditivity and synergism, as suggested by Rothman (12).

Results

The logistic regression analysis, considering all the patients, revealed that POS level is inversely associated to the odds of being smoker (OR = 0.76), while smoking at home (OR = 1.97) and being a female (OR = 1.97) are variables directly associated to the likelihood to be a smoker (Table 1).

Then we focused our attention to the POS level, in order to assess whether a cut-off level could be derived for discriminating smoking cessation. The ROC curve analysis showed a cut-off value of 3.4 as such discriminant (AUC = 0.447; p = 0.043) (Fig. 1).

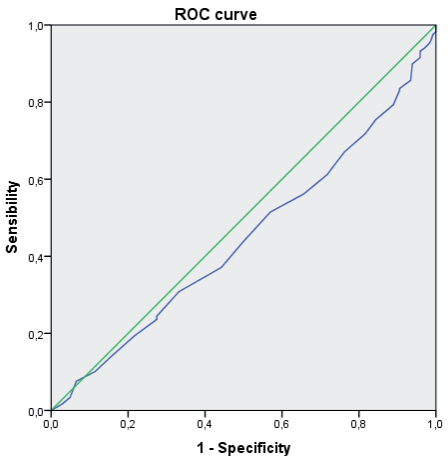

Fig. 1. ROC curve of the Positivity score

Moreover, we used this cut-off value for POS for performing separate logistic regression analyses, and we found the POS level acts as an effect modifier. In fact, for individuals with a POS level over or equal to 3.4 the odds of being smoker is higher among females (OR = 1.55), among those who smoke at home (OR = 2.16) and lower if there are children at home (OR = 0.53). On the other side, for individuals with a POS level under 3.4, the only significant variable associated with smoking is being a female (OR = 2.58), while having children at home and smoking at home increase the odds of being smoker in a not significant way (Table 1).

As far concerns the synergistic effect between the variables considered a synergistic effect does exist between POS levels and having children at home (SI=1.13) and female gender (SI = 2.8) (Table 2).

Discussion

The results of our study indicate that socio-economic factors can play an important role in influencing smoking cessation, and the level of POS has a strong role in determining this achievement.

Kaleta et al. (13) found that males and smokers older than 40 years of age have an higher odds of quitting smoking, while Hiscock et al. (14) found a higher odds among females and among people with increased age, and Sernia et al. (15) found that are associated with smoking cessation the increasing age and male gender. In the present study the highest probability of becoming a non-smoker is related to being a women, and there is no influence of age.

Identification of positive traits, behaviours, emotions, and cognitions that may promote well-being and flourishing has become a major goal of recent psychological research. Recently, an ecological study carried out by La Torre et al. (16) investigated the relationship between smoking prevalence and HAP levels at the international level. This study reported that countries with highest prevalence of males smoking show the lowest wellbeing levels. On the other hand, countries with highest prevalence of females smoking show the highest levels of wellbeing.

The present findings are consistent with assigning to POS a crucial role in sustaining individuals efforts to espouse healthier lifestyles, remaining happier than less positive individuals. In accordance with our hypothesis, levels of POS positively predicted smoking status, with more positive individuals more likely to be in the *ex-smokers* conditions. This result is of interest, since it underlines the potential represented by positive personality traits. Such potentials may be fruitfully suited in applied interventions, since they represent resources available to individuals to invest in effortful attempt to quit unhealthy lifestyles such as smoking. Of relevance our findings suggest that POS not only predicts smoking status, but also reduce craving to smoke. As it stands, positive *ex-smokers* were characterized also by a lower desire to revert to the past negative habit.

In light of this results, it seems fully reasonable that POS was further associated with HAP in the present data, which is another important insight from this study. Previous studies have often reported that *ex-smokers* reported feeling happier than when they were smoking after having abstained for a year or more (8). In sum, by increasing the subjective feeling of HAP, POS may also decrease the likelihood of recidivism due to the experience of negative affect after smoking.

POS does not prevent people to smoke if they like and wish, but it may serve as a protector factor against temptation, once they decide not to smoke, and a factor that may

Table 1. Results of the logistic regression analyses considering the Positivity (POS) score level. Dependent variable: current smoking

Variables		**POS level**	
		≥ 3.4	< 3.4
	OR (95%CI)	OR (95%CI)	OR (95%CI)
POS	0.76 (0.59 – 0.98)		
Age	0.98 (0.96 – 1.01)	0.98 (0.96 – 1.01)	0.98 (0.95 – 1.01)
Gender (F/M)	1.77 (1.21 – 2.59)	1.55 (1.00 - 2.46)	2.58 (1.31 – 5.07)
Children at home (Yes vs No)	0.72 (0.45 – 1.16)	**0.53 (0.30 – 0.94)**	1.57 (0.62 – 3.97)
Smoking at home (Yes vs No)	**1.97 (1.31 – 2.96)**	**2.16 (1.32 – 3.53)**	1.45 (0.74 – 3.23)

Table 2. Results of the synergistic interaction between the variables Positivity (POS) score, Having children at home and Gender

Variable 1 modalities	**Variable 2 modalities**	**OR**	**Synergistic interaction**
POS < 3.4	Smoking at home	1.22	
POS < 3.4	No Smoking at home	0.81	-0.29
POS >= 3.4	No Smoking at home	0.44	
POS < 3.4	Children at home	4.17	
POS < 3.4	No Children at home	2.12	1.13
POS >= 3.4	No Children at home	2.69	
POS < 3.4	Female	2.84	2.8
POS < 3.4	Male	1.16	
POS >= 3.4	Female	1.49	

facilitate and sustain the will to stop, once they decide to do so. Accordingly, to address and strengthen the major components of POS, like self-esteem and optimism, through social cognitive interventions may foster stop smoking and avoiding craving to smoke.

The synergistic effect between POS and socio-demographic factors offers further empirical evidences to recent studies positing POS among the major dispositional determinants of individual HAP. This finding gives value to the view that POS probably operates as a basic trait substantially influenced by heredity that pervasively influences people's mood and approach to experience (11). Finally, some thoughts must be cited to mention the role of the healthcare personnel in increasing smoking cessation rates among smokers. Everatt et al. (17) clearly demonstrated limited knowledge of family doctors in relation to epidemiological aspects of tobacco use and effective cessation assistance. On the other hand, there is limited evidence on the efficacy and effectiveness of electronic cigarette in increasing smoking cessation in a stable way (18) and the impact of health warnings among adolescents (19) and adults (20).

Disclosure of potential conflicts of interest:
The authors declared they have no competing interests.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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