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**WHICH GROUP OF SMOKERS IS MORE VULNERABLE
TO THE ECONOMIC CRISIS?**

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ABSTRACT

Objectives: Studies investigating whether smoking increases or decreases during economic downturn provided contrasting results. For the first time, we used direct questions to analyse changes in smoking due to the 2008 financial crisis, comparing socio-economic characteristics of smokers who changed with those who kept their smoking intensity.

Study design: Cross-sectional survey.

Methods: We used data from three annual surveys conducted in Italy in 2012-2014 on representative samples of the Italian general population aged ≥ 15 years.

Results: A total of 1919 current smokers were asked specific questions on the influence of the economic crisis started in 2008 on their smoking behaviour. Overall, 77.4% of 1919 current smokers reported not to have changed their smoking behaviour, 19.1% to have reduced, and 3.5% to have increased their smoking intensity as a consequence of the economic crisis. The reduction in cigarette smoking increased with age: compared to the respondents aged < 25 years, the multivariate odds ratio (OR) for those aged 25-44, 45-64 and ≥ 65 years were 0.65, 0.46 and 0.33, respectively (p for trend < 0.001). Reduction was significantly lower among intermediate (OR=0.68 compared to low) and high education levels (OR=0.28; p for trend < 0.001). A significant inverse trend for increasing consumption was observed with age ($p=0.022$), education ($p=0.003$) and family income ($p<0.001$).

Conclusions: The large majority of current smokers did not change their smoking habit following the economic crisis. However, there are specific vulnerable subgroups of smokers, constituted by the young and subjects with low socio-economic status, that were reactive to the global economic crisis. These groups are more prone to change their smoking behaviours, either for better or - in a smaller proportion - for worse.

Keywords: tobacco smoking; economic crisis; vulnerable population; smoking consumption, unemployed.

INTRODUCTION

Previous studies have already attempted to understand whether periods of economic downturn result in deterioration or improvement of population health, based on a variety of measures including psychological and behavioural morbidity, cardiovascular diseases, suicides and excess mortality.¹⁻⁶ With respect to tobacco smoking, contrasting results have been reported. On the one hand, evidence from studies conducted prior to the 2008 global economic crisis, mainly based on routine economic cycles, suggested a pro-cyclical relationship with smoking (the crisis decreases smoking consumption), possibly explained by a reduced affordability of tobacco products in hard times.⁷⁻¹² On the other hand, some of the most recent studies based on ex-post analysis of smoking behaviour after the 2008 financial crisis reported a null or even a counter-cyclical relationship (the crisis increased tobacco smoking), possibly explained by an increased psychological stress in selected vulnerable populations.¹³⁻²⁰ In the UK, for instance, the attempt rates for smoking cessation steadily declined after the onset of the economic crisis.²¹

In Italy, the crisis had dramatic socio-economic consequences: unemployment rate has increased from 6.1% in 2007, to 10.7% in 2012 and up to 12.7% in 2014. The corresponding figures for the economically active population aged <25 years were even more tragic, rising from 20.4% in 2007, to 35.2% in 2012 and up to 42.6% in 2014.²²

Whether the present economic recession influences smoking behaviour remains inconclusive, partly because published studies on the topic mainly focused on smoking prevalence, of which not much variation can be detected in the short term. Other aspects of tobacco use e.g., changes in smoking intensity, were not considered. Consequently, previous studies were not able to characterize individuals who changed their smoking behaviours. To fill this knowledge gap, we added to our Italian surveys a few original questions, allowing us not only to understand how the financial crisis had changed smoking intensity among current

smokers, but also to compare socio-economic characteristics of smokers who changed with those who kept their smoking intensity.

METHODS

This study utilizes face-to-face surveys on smoking conducted annually in Italy by DOXA, the Italian branch of the Worldwide Independent Network/Gallup International Association (WIN/GIA). Participants were selected through a representative multistage sampling in all 20 regions in Italy.²³ The first stage was used to select municipalities (the smallest Italian administrative division) in all of the 20 Italian regions (the largest Italian administrative division). Taking two characteristics as criteria, region and size, we identified from 116 to 152 municipalities (according to different survey years), representative of the Italian universe of municipalities (method known as proportional stratified sample). In the second stage, an adequate number of electoral wards (each ward corresponding to a given district of the municipality) was randomly extracted from each municipality so the various types of more or less affluent areas of the municipality were represented in the right proportions (i.e., central and suburban districts, outskirts and isolated houses). In the third stage, individuals were randomly selected from electoral lists, within strata of sex and age group. Adolescents aged 15–17 years, not included in the electoral lists, were chosen by means of a ‘quota’ method (by sex and exact age). Field substitution was used as the preferred strategy to deal with non-response. Unavailable participants were replaced by their neighbours (living in the same floor/building/street) with the same sex and age group. During data processing, statistical weights were generated to assure representativeness of the Italian population aged 15 and over.

For each survey year, the total sample consists around 3000 individuals, representative of the general Italian population aged 15 and over in terms of age, sex, geographical area and

socio-economic characteristics. For the present analysis, we considered a subsample of current smokers surveyed in the years 2012-2014. Therefore, the analysis is based on 1919 Italian smokers (641 in 2012, 616 in 2013 and 662 in 2014).

The structured questionnaire included information on demographic and socio-economic characteristics including level of education, family income and employment status. Education was categorized into low (up to middle school diploma), intermediate (high school) and high (university). Geographical area was categorized into three categories: northern (8 regions), central (4 regions) and southern Italy (8 regions including islands). A specific question designed to capture the impact of the economic crisis was formulated as follows: “Did you reduce, increase or maintain your smoking intensity as a consequence of the recent economic crisis?” Furthermore, the following question was asked in the 2012 survey: “Among dining out, cinema, charge card for cell phone, cigarettes, discotheque or other amusements, what would you give up first due to the economic crisis?”

Statistical analysis

Odds ratios (OR) and the corresponding 95% confidence intervals (CI), for increased/decreased versus not changed smoking consumption, were estimated using multinomial logistic regression models after adjustment for the following *a priori* selected covariates: sex, age (4 categories: 15-24; 25-44; 45-64; ≥ 65 years), education (3 categories: low; intermediate; high), geographic area (3 categories: North; Centre; South), and survey year (3 categories: 2012; 2013; 2014). There was no multicollinearity among independent variables. All the analyses were performed with SAS, version 9.2, statistical package (SAS Institute, Cary, NC, USA).

RESULTS

Among 1919 current smokers, 77.4% reported they had not changed their smoking habit as a consequence of the economic crisis, while 19.1% and 3.5% reported to have reduced or increased their smoking intensity, respectively (**Table 1**).

No significant sex difference in reduction of cigarette consumption was found. Reduction was highest among the young: compared to smokers aged <25 years, the ORs were 0.65 (95% CI: 0.46-0.93), 0.46 (95% CI: 0.32-0.68) and 0.33 (95% CI: 0.19-0.56) for smokers aged 25-44, 45-64 and ≥ 65 years, respectively (p for trend<0.001). As compared to low education, ORs for reduced consumption were 0.68 (95% CI: 0.53-0.89) for intermediate and 0.28 (95% CI: 0.18-0.44) for high education (p for trend<0.001). Reduction in smoking consumption was lowest in northern Italy than in central (OR=1.35; 95% CI: 0.98-1.87) and in southern Italy (OR=1.47; 95% CI: 1.11-1.88). Unemployed smokers reporting to have reduced smoking intensity accounted for 30.3%, versus 17.7% of employed smokers. Reduction in smoking consumption also appeared to be lowest in wealthy families. However, after adjustment for relevant covariates, no significant relation was observed either for employment status or for family income. Reduction in cigarette consumption decreased in 2014 compared to 2012 (OR=0.66; 95% CI: 0.50-0.88).

Increase in smoking intensity as a consequence of the economic crisis did not significantly differ by sex. The increase was greater among younger age group (aged 15-44 years; 4.4%) as compared to the older age group (aged ≥ 45 years; 2.6%). A significant inverse trend for increasing consumption was observed according to age category (p for trend=0.022). As compared to low education, ORs for increased consumption was 0.07 (95% CI: 0.01-0.46) for high education and a significant inverse trend for increasing consumption was observed with education (p=0.003). Compared to northern Italy, increase in cigarette consumption was more frequent in central Italy (OR=1.99; 95% CI: 1.08-3.67). Although increase in smoking intensity was highest among the unemployed, no significant relation was found by

employment status. An inverse trend was observed according to family income. As compared to the I tertile, ORs for increased consumption were 0.35 (95% CI: 0.19-0.64) and 0.10 (95% CI: 0.04-0.22) for II and III tertiles of family income, respectively (p for trend<0.001). Smokers increasing their cigarette consumption rose in 2013 (OR=2.85; 95% CI: 1.39-5.70) and 2014 (OR=2.15; 95% CI: 1.05-4.37) compared to 2012.

Among 641 Italian current smokers in 2012, only 13.7% reported that they would rather give up purchasing cigarettes due to the economic crisis while the remaining prefer to renounce other activities, including dining at restaurants (31.1%), going to discotheque or other amusements (26.7%) and going to cinemas (24.3%). Those preferring to renounce charging their cell phone accounted for only 4.3%.

DISCUSSION

Following the economic crisis, more than three-fourths of Italian smokers did not change their smoking habit and consumption. Also, more than 85% of smokers prefer giving leisure-time activities (such as going to the cinema, to the disco or dining out) to refraining from purchasing cigarettes as a consequence of the financial crisis.

Of all smokers, 19.1% reported to have reduced their smoking intensity and only 3.5% to have increased it. It appears, therefore, that the recent economic crisis resulted, if any, in a decrease in cigarette consumption among smokers. This result may be affected by misreporting of smoking behaviours, which has been shown to be substantial in previous studies^{24,25} and also in Italy.²⁶ For instance, in a confidential exit questionnaire of a trial for smoking cessation, 26% of 129 adolescents admitted to have under-reported and 15% to have over-reported smoking quantity and frequency during the study.²⁴ Moreover, also in a similar study based on 51 adolescent smokers, under-reporting (16%) was much more common than over-reporting (4%).²⁵

More interestingly, our multivariate analyses revealed similar demographic and socio-economic characteristics for both smokers reducing and increasing their cigarette consumption. This suggests that there is a single and specific “vulnerable population” more responsive to changes in smoking behaviours during hard times. This vulnerable population is more frequently represented by the young, unemployed, low educated and less affluent individuals, mostly from central and southern Italy (Italian areas experiencing the highest unemployment rates). Therefore, this vulnerable group of smokers reacts to the economic crisis in either one of the two contrasting ways. On the one hand, a group of smokers decides to reduce their consumption likely for affordability reasons. Indeed, there is evidence that the young and the poor are more responsive to price increases and to reduction in affordability of cigarettes.^{20,21,27} On the other hand, a minority of the same population reacts to the stressful consequences of an economic shock by increasing their smoking intensity.^{18,20} Accordingly, the economic crisis has been shown to be stressful for subgroups of population with a disadvantaged socio-economic status.^{28,29}

Likewise, a study based on large repeated cross-sectional surveys, analysing smoking prevalence before and after the onset of the 2008 economic crisis in the United States, showed a counter-cyclical relationship among the unemployed population.¹⁸ This relationship, unfavourable from a public health perspective, may have been exacerbated by the availability of relatively cheap tobacco products in the market, including roll-your-own (RYO) tobacco. This may be true also in Italy, where RYO tobacco use has increased over the past few years, particularly among the young and the most socio-economically disadvantaged populations.^{23,30,31}

Limitations of the present study include those inherent to the cross-sectional study design and the self-reported information on reduction/increase in smoking consumption as a consequence of the economic crisis, which may be affected by information bias. Moreover,

we were not able to quantify the effects of the economic crisis on smoking cessation since questions on the consequences of the economic crisis were not asked to former smokers. Also for current smokers, it was not possible to quantify the extent of smoking intensity change. Furthermore, our results may be sensitive to trends in smoking prevalence. However, smoking prevalence rates substantially decreased in Italy over the last 5 decades for men and the past 2 decades for women, but no significant decrease has been observed in men or women between 2007 and 2014.²³ Thus, smoking prevalence trend is unlikely to affect our results on the relationship between economic crisis and the change in smoking behaviours among smokers.

Strengths include the sample representativeness of the general Italian adult population. Moreover, to our knowledge, this is the first study using a direct question on changes in tobacco consumption due to the economic crisis. This allowed us to provide reliable answers to which socio-economic subgroup of individuals increased/decreased their smoking behaviour due to the crisis. Longitudinal studies have not yet been published and available repeated cross-sectional surveys or before/after studies (without direct questions on individual's behaviour) are not able to address this specific issue.¹⁸ The change in tobacco use, if any, points to a decrease in smoking intensity, which is indeed a welcoming move from a public health perspective. However, the reduction in tobacco consumption due to affordability reasons has been observed in specific vulnerable populations. This indicates that the economic crisis hit this group the hardest.

Acknowledgements

Ethical approval

Data come from population-based surveys on smoking. The studies were conducted according to national and European legislations and rules on general population surveys. No ethic committee approval was needed according to the national legislation. All survey participants were provided detailed information about the study and had to verbally consent to participate.

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Competing interests

All authors have no competing interests to disclose.

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Table 1 - Percentage distribution of 1919 current smokers according to how they changed their smoking habits (reduced consumption, increased consumption, not changed) due to the economic crisis, overall and by selected characteristics. Odds ratios (OR) and corresponding 95% confidence intervals (CI) for reduced and increased vs. not changed. Italy, 2012-2014.

	N	Not changed %	Reduced %	ORs ^a for reduced vs not changed (95% CI)	Increased %	ORs ^a for increased vs not changed (95% CI)
Total	1919	77.4	19.1	-	3.5	-
Sex						
Men	1107	76.5	19.8	1 ^b	3.7	1 ^b
Women	812	78.6	18.2	0.93 (0.74-1.19)	3.3	0.98 (0.59-1.62)
Age (years)						
<25	205	68.2	28.7	1 ^b	3.1	1 ^b
25-44	823	75.5	19.8	0.65 (0.46-0.93)	4.7	1.51 (0.63-3.62)
45-64	695	80.7	16.8	0.46 (0.32-0.68)	2.5	0.64 (0.25-1.66)
≥65	197	83.1	14.1	0.33 (0.19-0.56)	2.8	0.58 (0.18-1.93)
p for trend				<0.001		0.022
Education						
Low	693	73.2	23.0	1 ^b	3.9	1 ^b
Intermediate	952	76.7	19.1	0.68 (0.53-0.89)	4.2	0.87 (0.51-1.48)
High	274	90.2	9.3	0.28 (0.18-0.44)	0.4	0.07 (0.01-0.46)
p for trend				<0.001		0.003
Geographic area						
Northern Italy	859	81.3	15.7	1 ^b	3.0	1 ^b
Central Italy	370	75.1	19.7	1.35 (0.98-1.87)	5.3	1.99 (1.08-3.67)
Southern Italy and islands	691	73.7	23.0	1.47 (1.11-1.88)	3.3	1.18 (0.65-2.12)
Employment status ^c						
Employed	1163	78.6	17.7	1 ^b	3.7	1 ^b
Unemployed	194	65.6	30.3	1.38 (0.92-2.08)	4.1	1.07 (0.45-2.56)
Family income (€/month)						
I tertile (<1265€)	628	71.0	21.7	1 ^b	7.4	1 ^b
II tertile (1265€-1939€)	531	75.6	21.6	0.97 (0.73-1.30)	2.8	0.35 (0.19-0.64)
III tertile (≥1940€)	761	83.9	15.3	0.77 (0.57-1.05)	0.9	0.10 (0.04-0.22)
p for trend				0.101		<0.001
Survey year						
2012	641	76.2	22.0	1 ^b	1.8	1 ^b
2013	616	75.2	20.0	0.91 (0.69-1.21)	4.8	2.82 (1.39-5.70)
2014	662	80.5	15.5	0.66 (0.50-0.88)	4.1	2.15 (1.05-4.37)
p for trend				0.005		0.063

^a ORs were estimated using multinomial logistic regression model after adjustment for sex, age category, level of education, geographic area, and survey year.

^b Reference category.

^c Excluding students, retirees and homemakers.