

Impact of the economic crisis on health-related behaviors in Italy

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Abstract

Background: Evidence exists supporting the impact of the Great Recession on health-related behaviors internationally, though few studies are available concerning the Italian population.

Aim: To assess the impact of the late 2000s economic crisis on health-related behaviors linked to population mental health in Italy.

Methods: Descriptive study. Health indicators came from the Italian Institute of Statistics database (years 2000–2015). Statistics performed by means of linear regression models.

Results: Increased smokers ($\beta = 1.68, p = .03$), heavy smokers, that is, people smoking 11–20 cigarettes per day ($\beta = 2.18, p = .04$) or more than 20 cigarettes per day ($\beta = 1.04, p < .01$) and mean number of smoked cigarettes per day ($\beta = 0.56, p = .02$) were noticeable. Also, prevalence of overweight increased ($\beta = 0.91, p = .04$), while the Italian families' expenditure for alcoholic beverages decreased ($\beta = -812.80, p = .01$). Alcohol consumption decreased ($\beta = -0.60, p < .01$), especially in men ($\beta = -0.95, p < .01$); binge drinking increased in years 2009–2010. No change was noticeable in the diet indicators collected.

Conclusion: The economic crisis may have increased smoking, overweight and binge drinking in Italy (though data on the latter phenomenon are not conclusive), and reduced overall alcohol consumption.

Keywords

Economic crisis, alcohol, smoking, diet, physical activity

Introduction

After the onset of the late 2000s Great Recession (GR), many concerns arose regarding the possible impact of the economic downturn on the health of the populations (World Health Organization, 2009). A large amount of evidence produced in the last years pointed out a general detrimental effect of economic crises on health when austerity measures are implemented, namely when the budget destined to welfare and social protection is cut (Stuckler & Basu, 2013; Frاسquilho et al., 2016; Margerison-Zilko, Goldman-Mellor, Falconi, & Downing, 2016; Martin-Carrasco et al., 2016). Possible moderators of this were recognized in the amount of investments in active labor market programs, and, more generally, in social protection (Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009; Stuckler & Basu, 2013). With respect to the GR, its outcome on health seems to have been largely negative worldwide (Margerison-Zilko et al., 2016). Only a few studies, however, have investigated the impact of the crisis on health-related behaviors, though this topic is particularly relevant, considering the change occurred in the last 20 years in the ranking of major risk factors for the global burden

of disease, namely the shift from risks for communicable diseases (peculiarly among children) toward risks for non-communicable diseases (peculiarly among adults; Lim et al., 2013). For example, tobacco smoking and second hand exposure (still the second leading risk factor for global disease burden) cause about 6.3 million annual deaths worldwide, mostly in developing countries (Ezzatti & Riboli, 2013; Lim et al., 2013). In western Europe and North America, smoking (active or second hand) is the

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leading risk factor, while in eastern Europe, Andean Latin America and southern sub-Saharan Africa is alcohol use. As far as diet and physical inactivity are concerned, they account for 10% of global Disability-Adjusted Life Years (DALY; Lim et al., 2013).

Another reason why health-related behaviors are worth studying is represented by their link with psychological conditions and mental health. With respect to alcohol and tobacco consumption, it is widely recognized the frequent co-occurrence of such behaviors in groups of people affected by mental disorders, along a spectrum that spreads from the construct of dual diagnosis to the coping mechanisms an individual can activate to regulate negative emotions and face a stressful situation, as financial strain and unemployment (Cooper, Frone, Russell, & Mudar, 1995; Kessler, 2004; De Vogli & Santinello, 2005; Graham, Frost-Pineda, & Gold, 2007; Sinha, 2008; Dom et al., 2016). The link between the latter and harmful substance use was recently addressed by de Goeij et al. (2015), who proposed two behavioral mechanisms that may impact on alcohol-related behaviors and tobacco use in times of financial hardship. The first one posits that during economic crisis alcohol consumption decreases since less money is spent on alcoholic beverages, due to tighter budget constraints. This mechanism seems cross-sectional to all population subgroups, across the majority of countries. The second behavioral mechanism is based on psychological distress and leads to increased alcohol consumption.

Placed within the framework of the stress-vulnerability model, alcohol consumption and tobacco smoking may represent 'mechanisms of coping', though ultimately dysfunctional, to obtain short-term relief in times of heavy distress, such as in periods when work is threaten (Jarvis & Wardle, 2005). Similarly, food may represent an easy-to-obtain 'anxiolytic', considering the well-known relation between stress and diet (Yau & Potenza, 2013). Therefore, changes in the individuals' diet may be due not only to decreased availability of money, with subsequent access to low quality food; as for tobacco and alcoholics, food choices may represent a way of coping with a difficult and stressful moment of life. Another similarity concerning tobacco and alcohol on one hand, and diet and obesity on the other, is that stress represents a common risk factor for both obesity and addiction (Sinha & Jastreboff, 2013).

Steptoe and Marmot (2003) studied the associations between biobehavioral risk factors and quality of life. Even if no association stemmed out between health behaviors and the psychosocial adversity and vulnerability index studied, significant associations emerged with psychological distress, depression, hopelessness, sleep problems, hostility, low self-esteem and loneliness, independently of age, sex, socio-economic status and marital status. Also, higher psychosocial adversity or vulnerability was associated with levels of glycohemoglobin, plasma fibrinogen,

plasma viscosity and body mass (the latter among women). Altogether, these data encourage to further study the relation between socio-economic environment, individuals' distress, behavioral responses and mental health outcome.

The aim of this study is to assess the impact of the economic crisis on health-related behaviors linked to population mental health in Italy. Differently than other Eurozone members, since 2008 Italy has suffered a triple-dip recession, with the first begun in 2008, the second in 2011 and the third in 2014 (O'Brien, 2014). In the same period, austerity measures were implemented by the Italian Governments, and negative short-term effects on the health of the Italian population were reported. In the first years of economic crisis (i.e. 2008–2010), an increase in suicides and attempted suicides specifically due to financial problems was reported in Italy (De Vogli, Marmot & Stuckler, 2013; Mattei, Ferrari, Pingani, & Rigatelli, 2014; Mattei, Ferrari, & Rigatelli, 2011). Also, a noticeable effect was pointed out in terms of increased ischemic heart disease and cardiovascular mortality (Mattei et al., 2014; Torbica, Maggioni, & Ghislandi, 2015), consumption of nicotine (Gallus et al., 2011), decreased consumption of expensive illicit drugs and increased consumption of cheap illicit drugs (Zuccato et al., 2011), and increased 'occasional' consumption of alcoholic beverages (Mattei et al., 2014). Yet, the majority of studies published on the impact of the economic crisis on the health of the Italian population concerned the first years of economic crisis, and there is little information on how the crisis changed health-related behaviors such as smoking, diet and physical activity, which may be linked to the change in the socio-economic environment by means of psychological mechanisms and levels of perceived distress. Starting from available evidence on this topic, our hypothesis was that the economic downturn had caused an increase in alcohol and tobacco consumption (Hammarström & Janlert, 2003), as well as an increase in physical activity (since in times of financial hardship people travel less, especially by car, with a noticeable reduction in traffic fatalities; Uutela, 2010). With respect to overweight and obesity, we had actually no conclusive hypothesis, given that both increased and decreased overweight may have been expected: the first due to cheap, junk food consumption, the latter due to increased physical activity.

Methods

Study design and data collection

This is a descriptive study. The following health indicators were collected: alcohol consumption (data refer to people aged over 11 years old, consuming alcohol in the year, everyday, occasionally or out of meal; also, data referring to males and females aged over 15 years old, consuming alcoholics, namely wine and beer, in the week or everyday

were collected), smoking behavior (number of current smokers, number of former smokers, number of non-smokers, number of smoked cigarettes: 1–5 per day, 6–10 per day, 11–20 per day, >20 per day, mean number of smoked cigarettes per day), physical activity (number of people practicing regularly, unregularly, only sometimes or never), obese people aged >18, obese males aged >18, obese females aged >18, overweight people (males and females) aged >18, overweight males aged >18, overweight females aged >18; people, males and females, eating meat and fish every week, and cheese and vegetables everyday. All indicators represented the number of people having that condition or behavior per 100 people with the same features. Also, following economic indicators were collected: Italian families' expenditure for alcohol beverages, tobacco and narcotics, Italian families' expenditure for alcohol beverages only, Italian families' expenditure for tobacco and narcotics (all expressed in Euro per year), rate of unemployment and GDP per capita.

All data were obtained from the website of the Italian National Institute of Statistics, ISTAT (www.istat.it), in particular from the Information and Communications Technology system 'Health for All Italia', a territorial informatics system about health that may be freely downloaded at the following site: <http://www.istat.it/it/archivio/14562> and from I.Stat, a wide database provided by ISTAT at the following site: <http://dati.istat.it>.

The period of time considered was 2000–2015, but please note that for some indicators data were not available for the entire period.

Dating the GR

As far as the recession dating is concerned, it is important to notice that it did not start simultaneously worldwide. With respect to Italy, in this study 2008 was considered the first year of recession, given that the third and fourth trimester of that year recorded a consecutive negative variation of GDP (source: ISTAT). Also, in 2008, the Italian rate of unemployment increased for the first time after 10 years, starting from the fourth trimester. It can be assumed that the second half of 2008 corresponds to the time when the Italian population began *experiencing* the crisis (Mattei et al., 2014). Further details about the GR and the main causes that led to the worst economic crisis since the 1929 Great Depression may be found elsewhere (De Vogli & Owusu, 2014).

Statistical analysis

The analysis was carried on by means of linear regression models, with the dependent variable represented by all collected health indicators while independent variables were time and crisis years. Time was referred to years from 2000 to 2015; crisis was a dummy variable having the

following values: 0 for years 2000–2007, 1 for years 2008–2015, to test the possible effect of the economic crisis on the collected indicators (absence of economic crisis vs presence of economic crisis). As ordinary least squares regression analysis suits better when the assumption of homoscedasticity is valid, which is usually the exception in psychiatric epidemiology and econometrics, 95% confidence intervals (CIs) were estimated for all coefficients on the basis of heteroscedasticity-robust standard errors. STATA 13.0 (Stata Corporation, College Station, TX, USA) was used for all analyses. Since data about alcohol consumption in the year, everyday, occasionally or out of meal in years 2000–2003 refer to the percentage of people aged over 14 years old, while in years 2005–2014 refer to people aged over 11 years old (data recording was changed by ISTAT), the regression analysis for such variables included observations only for years 2005–2014.

As data were anonymous and aggregated at the origin, Ethics Committee approval was not sought.

Results

Table 1 shows the results of the regression analysis, which compares the years of economic crisis (2008–2015) with the previous ones (2000–2007).

With respect to alcohol consumption in the year and out of meal among people aged 11 or more, a significant reduction was noticeable in the period of time considered, with no apparent effect due to the crisis. Differently, considering the overall rate of people aged 15 or more who consume alcoholics more than once per week, a significant decrease was noticeable ($\beta = -0.60$, 95% CI = -0.96 ; -0.24), peculiarly among men ($\beta = -0.95$, 95% CI = -1.50 ; -0.41). The consumption of beer and wine showed a steady and significant decline, without association with the economic situation; similarly, the percentage of people who never drank showed a steady increase, not influenced by the crisis. Binge drinking behaviors among people aged >11 years old were not associated with the years of economic crisis (2008–2015), although an increase was noticeable in the years of the GR (2008–2010), from a descriptive standpoint, both among men and women.

With respect to smoking (Figure 1), the analysis pointed out an increase in the number of smokers ($\beta = 1.68$, 95% CI = 0.17 ; 3.20), heavy smokers, that is, people smoking 11–20 cigarettes per day ($\beta = 2.18$, 95% CI = 0.12 ; 4.26) or more than 20 cigarettes per day ($\beta = 1.04$, 95% CI = 0.45 ; 1.62) and mean number of smoked cigarettes per day ($\beta = 0.56$, 95% CI = 0.13 ; 0.99). Also, the prevalence of overweight increased during the economic downturn ($\beta = 0.91$, 95% CI = 0.03 ; 1.79). Italian families' expenditure for alcoholic beverages (expressed in Euro per year) were negatively associated with the economic crisis ($\beta = -812.80$, 95% CI = -1397.62 ; -227.98).

Table 1. Results of the linear regression analysis (2000–2007 vs 2008–2015).

	2000–2007 versus 2008–2015			<i>R</i> ²	Time-trend association
	β	<i>p</i>	95% CI		
Alcohol consumption – in the year (2005–2014)	0.97	.27	–0.95; 2.88	.95	–
Alcohol consumption – everyday (2005–2014)	–5.24	.26	–15.40; 4.92	.37	NS
Alcohol consumption – occasionally (2005–2014)	0.79	.40	–1.31; 2.88	.55	NS
Alcohol consumption – out of meal (2005–2014)	1.75	.09	–0.34; 3.85	.49	–
Alcohol consumption – % of people (males and females, aged >15) drinking alcoholics more than once per week	–0.60	<.01	–0.96; –0.24	.70	NS
Alcohol consumption – % of people (males, aged >15) drinking alcoholics more than once per week	–0.95	<.01	–1.50; –0.41	.81	NS
Alcohol consumption – % of people (females, aged >15) drinking alcoholics more than once per week	–0.28	.17	–0.70; 0.14	.47	+
Alcohol consumption – % of people (males and females, aged >15) drinking wine regularly	–1.00	.27	–2.89; 0.88	.94	–
Alcohol consumption – % of people (males, aged >15) drinking wine regularly	–1.56	.21	–4.10; 0.98	.95	–
Alcohol consumption – % of people (females, aged >15) drinking wine regularly	–0.52	.42	–1.88; 0.84	.93	–
Alcohol consumption – % of people (males and females, aged >15) drinking >0.5 L of wine everyday	–0.14	.21	–0.38; 0.09	.98	–
Alcohol consumption – % of people (males, aged >15) drinking >0.5 L of wine everyday	–0.39	.08	–0.82; 0.05	.98	–
Alcohol consumption – % of people (females, aged >15) drinking >0.5 L of wine everyday	0.07	.67	–0.26; 0.39	.81	–
Alcohol consumption – % of people (males and females, aged >15) drinking beer regularly	–0.03	.90	–0.55; 0.49	.81	–
Alcohol consumption – % of people (males, aged >15) drinking beer regularly	–0.02	.96	–0.92; 0.87	.78	–
Alcohol consumption – % of people (females, aged >15) drinking beer regularly	–0.03	.79	–0.31; 0.24	.72	–
Alcohol consumption – % of people (males and females, aged >15) drinking >0.5 L of beer everyday	–0.02	.74	–0.22; 0.16	.85	–
Alcohol consumption – % of people (males, aged >15) drinking >0.5 L of beer everyday	–0.10	.61	–0.53; 0.32	.78	NS
Alcohol consumption – % of people (females, aged >15) drinking >0.5 L of beer everyday	0.03	.38	–0.05; 0.11	.69	–
Alcohol consumption – % of people (males and females, aged >15) who never drank alcoholics	–0.19	.78	–1.67; 1.29	.90	+
Alcohol consumption – % of people (males, aged >15) who never drank alcoholics	0.24	.66	–0.92; 1.39	.92	+
Alcohol consumption – % of people (females, aged >15) who never drank alcoholics	–0.57	.54	–2.55; 1.41	.84	+
Alcohol consumption – % of people (males and females, aged >11) who adopt binge drinking behaviors	0.01	.99	–1.37; 1.39	.40	NS
Alcohol consumption – % of people (males, aged >11) who adopt binge drinking behaviors	–0.13	.88	–2.18; 1.90	.46	NS
Alcohol consumption – % of people (females, aged >11) who adopt binge drinking behaviors	0.17	.65	–0.64; 0.97	.10	NS
Number of smokers	1.68	.03	0.17; 3.20	.82	–
Number of former smokers	0.07	.91	–1.39; 1.54	.63	NS
Number of non-smokers	–1.72	.16	–4.26; 0.82	.36	NS
Number of smokers (only cigarettes)	0.36	.57	–1.00; 1.72	.21	NS
Number of smokers (1–5 cigarettes per day)	–1.70	.11	–3.92; 0.50	.89	+
Number of smokers (6–10 cigarettes per day)	–1.07	.26	–3.07; 0.93	.81	+
Number of smokers (11–20 cigarettes per day)	2.18	.04	0.12; 4.26	.91	–
Number of smokers (>20 cigarettes per day)	1.04	<.01	0.45; 1.62	.97	–

Table 1. (Continued)

	2000–2007 versus 2008–2015				Time-trend association
	β	p	95% CI	R^2	
Mean number of smoked cigarettes per day	0.56	.02	0.13; 0.99	.93	–
Italian families' expenditure for alcoholic beverages, tobacco and narcotics (Euro per year)	–1411.87	.43	–5137.99; 2314.25	.89	+
Italian families' expenditure for alcoholic beverages (Euro per year)	–812.80	.01	–1397.62; –227.98	.88	+
Italian families' expenditure for tobacco and narcotics (Euro per year)	–821.87	.64	–4549.90; 2906.15	.85	+
Physical activity – regularly	0.30	.53	–0.71; 1.31	.82	+
Physical activity – unregularly	0.16	.67	–0.63; 0.94	.54	–
Physical activity – only sometimes	–0.13	.90	–2.28; 2.03	.14	NS
Physical activity – never	–0.34	.70	–2.25; 1.56	.17	NS
Obese people, males and females, aged >18	–0.11	.75	–0.86; 0.64	.69	+
Obese people, males only, aged >18	0.36	.37	–0.48; 1.21	.75	+
Obese people, females only, aged >18	–0.55	.17	–1.39; 0.28	.47	+
Overweight people, males and females, aged >18	0.91	.04	0.03; 1.79	.85	+
Overweight people, males only, aged >18	1.15	.09	–0.21; 2.51	.73	NS
Overweight people, females only, aged >18	0.69	.10	–0.15; 1.53	.79	NS
Food – % of people (males and females, aged >3) who eat meat sometimes in the week	–1.19	.60	–6.12; 3.73	.42	NS
Food – % people (males, aged >3) who eat meat sometimes in the week	–0.97	.66	–5.73; 3.80	.36	NS
Food – % of people (females, aged >3) who eat meat sometimes in the week	–1.40	.56	–6.52; 3.71	.46	NS
Food – % of people (males and females, aged >3) who eat fish sometimes in the week	–1.64	.22	–4.44; 1.16	.29	NS
Food – % of people (males, aged >3) who eat fish sometimes in the week	–1.31	.29	–3.93; 1.30	.22	NS
Food – % of people (females, aged >3) who eat fish sometimes in the week	–1.94	.19	–4.99; 1.09	.35	NS
Food – % of people (males and females, aged >3) who eat cheese at least once a day	0.67	.47	–1.29; 2.64	.94	–
Food – % of people (males, aged >3) who eat cheese at least once a day	0.22	.79	–1.57; 2.01	.95	–
Food – % of people (females, aged >3) who eat cheese at least once a day	1.11	.31	–1.16; 3.37	.91	–
Food – % of people (males and females, aged >3) who eat vegetables at least once a day	–1.05	.35	–3.41; 1.30	.81	+
Food – % of people (males, aged >3) who eat vegetables at least once a day	–1.08	.20	–2.84; 0.67	.76	+
Food – % of people (females, aged >3) who eat vegetables at least once a day	–1.02	.47	–4.03; 1.97	.81	+

CI: confidence interval.

Significant coefficients in bold. In the analysis, dependent variables were all collected health indicators; independent variables were crisis years (for which coefficient, p -value, 95% CI and R^2 are reported) and time-trend. For the latter, when a significant ($p < .05$) association was noticeable, it is reported (+ indicating a positive time-trend, – indicating a negative time-trend). NS (not significant) means that that peculiar variable (e.g. Alcohol consumption everyday 2005–2014) was not associated with time in the period of time considered.

All variables concerning physical activity and diet were not influenced by the economic crisis.

Discussion

The main results of this study concern smoking behavior, overweight and alcohol consumption. With respect to the latter, Italian data seem consistent with other studies (Asgeirsdottir, Corman, Noonan, Ólafsdóttir, & Reichman,

2014; Bor, Basu, Coutts, McKee, & Stuckler, 2013; Toffolutti & Suhrcke, 2014), pointing out decreased prevalence of any alcohol use during the economic recession and increased prevalence in binge drinking. Based on existing literature, such findings were expected; yet, our previous observations pointed out a short-term increase in alcohol consumption in 2009, the year featured by the worst real GDP decrease, in Italy (–5.1%, Mattei et al., 2014). Such discrepancies may be explained by a two-speed process,

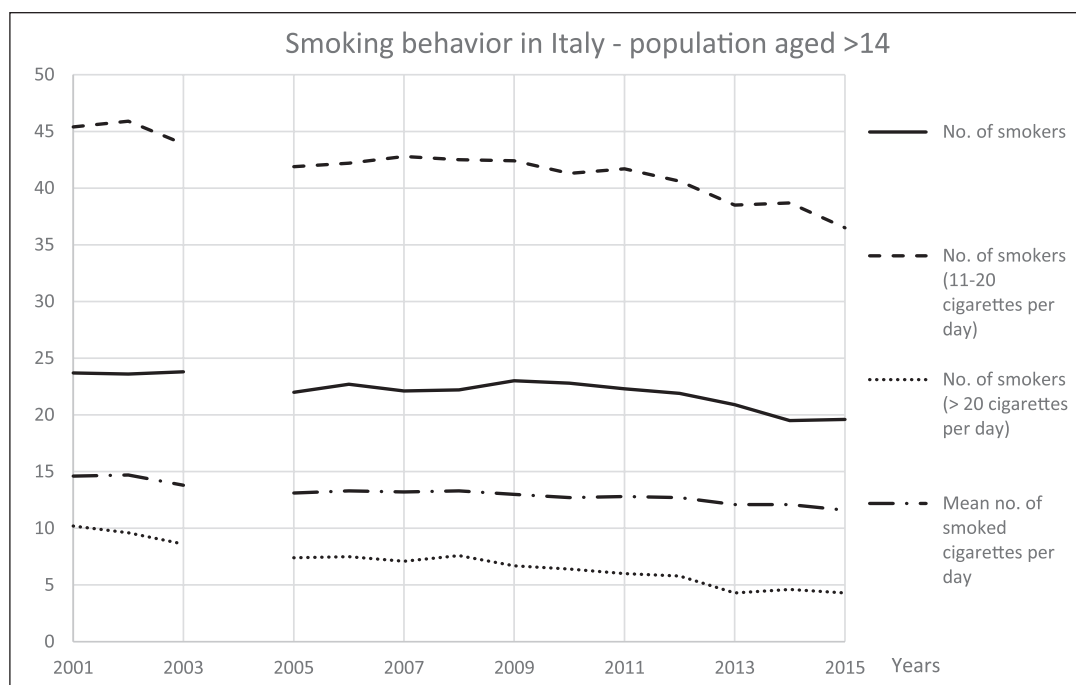


Figure 1. Smoking behavior among people aged > 14 years old (Nr. of smokers per 100 persons with same features).

that is, an acute phase (the very first years of crisis) in which both overall consumption and binge drinking increased, and a second, longer phase in which income reduction led to decreased alcoholics consumption. Notably, this study covers a period of time longer than the GR, since the latter represented the beginning of a longer phase of economic crisis (and repeated recession), which prolonged until 2015. Also, it is worth noticing that the GR in Italy, rather than causing new, negative socio-economic conditions, speeded up already existing negative processes affecting the economy, in stagnation at least from year 2000 (Mattei et al., 2015). The decreased overall alcohol consumption among men may be due to the fact that in the first years of economic crisis the Italian male population was mainly hit by unemployment or fear of unemployment (Giovannini, 2009). Reduced income in such group may have determined less money to spend in alcoholic beverages (de Goeij et al., 2015).

Besides confirming previous observations referring to the very first years of recession (Gallus et al., 2011), our study adds that the effect on the economic downturn on tobacco smoking may have had a longer duration, as Figure 1 shows; we believe that this may be relevant for public health given the well-known effects of smoking (both active or second hand) on health (in the short, medium and long period). Also, our data does not support the hypothesis that increased smoking behavior was largely attributable to former smokers relapse, as other authors pointed out (Gallus et al., 2011). Other causes may have acted; for example, tobacco may be considered a cheap drug, easy to be obtained and socially accepted, to

turn to irrespectively from previous smoking habits. In the years of the economic crisis, a decreased consumption of expensive illicit drugs was noticeable, while consumption of cheap illicit drugs increased (Zuccato et al., 2011). Smoking may be considered, at least in part, a 'cheap licit drug', to turn to easily in times of hardship, both economic or not.

Finally, our data support the hypothesis that, beside a steady increase in the prevalence of overweight, the crisis itself may have played an independent, additional role, acting via different mechanisms. On one hand, the financial strain may have acted as chronic stressor, with noticeable and well-known effects on metabolism (Sinha & Jastreboff, 2013). On the other hand, it is possible that people who are still working, though are at risk of unemployment or experience work instabilities, have less time to dedicate to themselves and to their lifestyle (including food choice and physical activity), in the same way as less sick leave was documented due to fear of losing job (Mattei et al., 2015).

This study has several limitations. First, due to the nature of data, no causal relation can be drawn. Yet, relevant findings emerged concerning Italians' health-related behaviors, possibly due to prolonged exposure to psychosocial stress, and consistently with other published literature. Second, we found many missing values (e.g. for alcohol indicators), and the period of time considered was relatively short. This may have led to spurious associations or lack of associations. Yet, the methods adopted made the study feasible, helping at gaining knowledge on a topic particularly controversial, as the effects of socio-economic

changes on health. Third, it was pointed out that rates may be non-stationary unit root processes, making them unfit for the regression analysis with ordinary least square methods, for the risk of type I error (Ceccherini-Nelli & Priebe, 2011). Yet, the majority of studies in this field adopted regression analysis, with results similar to those that used other more sophisticated statistical approaches; also, we used heteroscedasticity-robust standard errors, to strengthen our analysis. Fourth, this study did not include data on suicide and attempted suicide behaviors, though representing an important issue, frequently debated, in the last decade, especially with respect to the possible link with work and unemployment. Yet, this is one of the most studied topics, even in Italy, where a general shortage of research concerning the effect of the economic crisis on health is noticeable. Other papers have already addressed this topic (e.g. De Vogli, 2013; De Vogli et al., 2013). Also, recent data about suicide behaviors from other countries such as Greece (Economou, Angelopoulos, Peppou, Souliotis, & Stefanis, 2016) are consistent with the hypothesis that suicide and attempted suicide may represent an acute response to economic downturns (De Vogli et al., 2013; Hong, Knapp, & McGuire, 2011). In this study, a wider temporal frame was considered, unable to detect such rapid, acute increase, as well as aggregated data were used, while Italian studies on suicide using disaggregated data already exist. Also, it was our intention to point out other less studied and debated issues that may be particularly relevant for public health and mental health services. Fifth, our analysis did not include data concerning cardiovascular mortality, though evidence in literature suggests a possible link with the socio-economic environment. Yet, this topic was already addressed by previous Italian studies published in recent years (e.g. Torbica et al., 2015); therefore, we included in our paper less studied indexes, such as food consumption, overweight and obesity. Sixth and final, given the study design adopted, we focused on population as unit of analysis instead of people; therefore, aggregated data were used; this may have partly limited our analysis, given that, as above mentioned, spurious associations (or lack of associations) may happen when data are excessively aggregated. Also, for the same reason, we were not able to detect high-risk, vulnerable groups, which is still a crucial topic in epidemiology. Yet, this limitation of our study highlights the need for further research in this field, especially as far as the Italian population is concerned, based on disaggregated data.

Conclusion

The economic crisis seems to have determined an increase in smoking and overweight prevalence and a decrease in overall alcohol consumption. An increase in binge drinking may have taken place in the years of the GR, though data are not conclusive. Future research is needed to assess

the possible long-term consequences of such behavioral changes in terms of cardio-metabolic and oncological outcomes, especially because life expectancy in Italy started to decline after decades of steady increase for the first time in 2015 (ISTAT, 2016). This is crucial for the design of policies and interventions that can tackle the negative impact of the crisis on public health.

Availability of data and materials

All data used for this study are available upon request addressed to the corresponding author.

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