The association between body mass index and health outcomes in Italy

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Introduction

- The global obesity epidemic has rapidly progressed in the past decade.¹
- In 2013, an estimated 31.8% of the adult population in Italy were overweight and 8.9% were obese² and, by 2015, these figures rose to 36.2% and 10.2%, respectively.³
- Obesity is a risk factor for cardiovascular disease, cancer, type 2 diabetes (T2D), osteoarthritis, non-alcoholic fatty liver disease, sleep apnea and psychiatric conditions.¹
- Consequently, obesity is associated with high societal costs and impaired quality of life.⁴⁻⁶
- In Italy, existing epidemiological and economic consequence of obesity data are outdated and figures on the outcomes of obesity on patient-reported effects, including activity impairment and quality of life, are limited.

Objective

- To quantify the association between body mass index (BMI), health outcomes and health-related costs among adults in Italy.

Methods

- Italian data from the 2013 European National Health and Wellness Survey (NHWS), an annual, internet-based health questionnaire administered to a nationwide sample of adults (aged ≥18 years) in 10 countries globally, were used (n=10,000).
- Respondents with missing weight information (n=177), BMI <18.5 kg/m² (n=352, based on self-reported height and weight), and those who had undergone bariatric surgery (n=38) were excluded from analyses. The total sample size was 9433.
- Health related quality of life (HRQoL) was assessed using SF-36v2 questionnaires and included mental (MCS) and physical component summary (PCS) and health state utilities. Work productivity and activity impairment (WPAI) was quantified via WPAI questionnaire scores. The indirect/direct costs associated with healthcare resource use were estimated by utilising average-values reported in the literature and converted to Euros (2013 exchange rates).
- Regression models investigated differences in outcome measures amongst BMI classes, controlling for demographic and health history variables.
- Analyses were repeated for three sub-groups: T2D, pre-diabetes and hypertension.

Results

- Of 9433 respondents who met the inclusion criteria; 52.26% were normal weight (BMI <25 kg/m²), 34.85% overweight (25 to <30 kg/m²), 9.49% obese class I (30 to <35 kg/m²), 2.28% obese class II (35 to <40 kg/m²), and 1.12% obese class III (≥40 kg/m²). The prevalence of overweight and obesity was highest in T2D, pre-diabetes and hypertension sub-groups (Figure 1).
- Overall, more males were overweight or obese class I, but more females were obese class II and III.
- Obesity was associated with lower education, annual salary and employment rates compared with normal weight.
- Mental (MCS) and physical component summary scores (PCS) were significantly higher across all BMI groups compared with obese class III; differences in PCS scores between obese class II/III compared with normal weight groups were considered clinically relevant (i.e. >3 points) (Figure 2).

Figure 1 Prevalence of obesity across sub-groups.

Figure 2 Adjusted mean HRQoL across BMI classes.

Figure 3 Adjusted work and activity impairment across BMI classes.

- Health utility scores were lower in all respondents and all sub-groups that were obese (Table 1), compared with respondents with a normal weight.
- BMI class had a significant effect on activity impairment (Figure 3).
- Indirect costs, defined as a loss of work productivity, concurrently increased with increasing BMI classes in all respondents across all sub-groups (Table 1).

Table 1 Adjusted mean health utility scores and total annual indirect costs across BMI classes.

		All adults (N=9433)	T2D (N=421)	Pre-diabetes (N=1771)	Hypertension (N=2646)
Health state utility score	Normal (18.5 to <25 kg/m ²)	0.70*	0.66*	0.68*	0.67*
	Overweight (25 to <30 kg/m ²)	0.70*	0.65*	0.70*	0.67*
	Obese I (30 to <35 kg/m ²)	0.68*	0.66*	0.68	0.66
	Obese II (35 to <40 kg/m ²)	0.67	0.65*	0.66	0.65
	Obese III (40+ kg/m ²)	0.65	0.58	0.65	0.63
Total annual indirect costs (€)	Normal (18.5 to <25 kg/m ²)	4256*	5609	3331	4537
	Overweight (25 to <30 kg/m ²)	4800	6476	3770	5191
	Obese I (30 to <35 kg/m ²)	4803	6427	4257	5775
	Obese II (35 to <40 kg/m ²)	5934	4575	3332	6097
	Obese III (40+ kg/m ²)	6828	8377	3860	5471

Models controlled for age, sex, marital status, household income, smoking status, alcohol consumption, exercise behavior, the Charlson comorbidity index, treated psychiatric conditions, and treated thyroid conditions. *p<0.05 relative to obese class III. T2D, type 2 diabetes.

References

- World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva: World Health Organization, 2000.
- Gallus *et al.* *Eur J Nutr* 2013; 52:677–85.
- Italy in Figures; 2015. <http://www.istat.it/en/files/2015/09/ItalyinFigures2015.pdf>. Accessed 20 October 2017.
- Konnopka *et al.* *Eur J Health Econ* 2011; 12:345–52.
- Kushner *et al.* *Nutrition* 2000; 16:947–52.
- Kolotkin *et al.* *Obes Rev* 2001; 2:219–29.

Conclusions

- In this study, just under half of the adult population in Italy were overweight (BMI >25 kg/m²) and 12.89% were considered obese, which is higher than figures previously reported in 2013 and 2015.^{2,3}
- The prevalence of obesity was highest in T2D, pre-diabetic and hypertension sub-groups.
- In Italy, obesity significantly impairs quality of life and daily activity across the adult population and is a substantial economic burden.
- Both patients and society in Italy could benefit from an improved management of obesity.

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