Ann Ist Super Sanità 2024 | Vol. 60, No. 2: 89-97
DOI: 10.4415/ANN_24_02_02

Diet and lifestyles of young women of childbearing age: an Italian survey

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Abstract

Background. Daily lifestyles play a pivotal role in influencing the preconception health of women in their childbearing years. The aim of this cross-sectional study is to delineate, within the Italian context, the lifestyles of young women of childbearing age, that may have repercussions on their preconception health.

Methods. From July 2020 until April 2021, an anonymous online questionnaire was administered to a sample of 340 women aged 18-25 years attending secondary grade schools and universities in Italy.

Results. Over the course of the preceding three days, 90.29% of women had meat, 45.59% had fish. 28.24%, 38.82% and 18.53% of women reported tobacco, alcohol and drugs consumption, respectively. The mean amount of folic acid taken through foods consumed was 341 µg/day. Only 53.53% of women did sports. Smokers were more frequently consuming alcohol and drugs. Women who never did sports, were more likely to use drugs.

Conclusions. Young women in our sample had suboptimal dietary habits. It is imperative to advocate for policies and interventions that endorse healthy dietary patterns and physical activity, improve knowledge and discourage young women from smoking, alcohol consumption and drug use.

Key words

- preconception
- diet
- lifestyle
- alcohol
- smoking

INTRODUCTION

Preconception health refers to women's health before they become pregnant. From a public health standpoint, the preconception period denotes a sensitive phase in the life course, such as adolescence, when health-related behaviours are established [1-3]. Lifestyle and dietary habits cultivated in everyday routine, particularly at a young age, are key to preconception health and could influence the health of women in their childbearing age [4-8].

Numerous studies have documented that nutrition, physical activity, control of body weight and healthy lifestyles (avoiding smoking, alcohol and drugs) are pivotal factors with the potential to enhance the health status of this population group [9].

Notably, an eating regimen characterised by meat consumption, snacks and sweets has been linked to a significantly higher risk of gestational diabetes mellitus in women, particularly in those with lower education level. Moreover, income plays a crucial role in fat-related chronic diseases, as the consumption of low-cost, high-fat/high-sugar foods is markedly more prevalent among socioeconomically disadvantaged populations [10]. The universal consensus surrounding the significance of folic acid is of particular relevance to women of childbearing age [11, 12]. Inappropriate dietary practices and insufficient supplementation lead to inadequate folic acid intake [13].

Physical activity plays an important role on women's body weight, pregnancy outcomes, and the risk of chronic diseases in their offspring during adulthood. Nevertheless, the number of women of childbearing age that meet the recommended amount of weekly physical activity remains still unsatisfactory [14].

Among lifestyle behaviours, the consumption of illicit substances and alcohol poses a considerable risk to women's health and pregnancy outcomes. Despite the well-documented adverse effects, some women persist in consuming alcohol, smoking or using drugs, during the preconception period, as well as throughout pregnancy [8, 15].

Unhealthy parental behaviours such as a high body mass index (BMI), smoking, low quality diet, food insecurity or sedentary lifestyle before or during pregnancy, are also associated with an elevated BMI and a heightened risk of overweight and obesity in children aged 5-12 years [16-18]. Higher rates of these unhealthy behaviours are generally associated with education level, educational interventions, screening services, general health counselling and income [19]. As indicated in the

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literature, younger women are more prone to engage in unhealthy behaviours and are at higher risk of unintended pregnancies, underscoring the need for targeted attention to this demographic [19-21].

Considering these factors, interventions aimed at improving dietary and lifestyle behaviours are of paramount importance in safeguarding women's health, enhancing pregnancy outcomes and mitigating children's risks. However, interventions implemented at the moment of conception can be tardive in preventing these risks. In this context, the preconception period represents a unique opportunity to instigate positive health transformations.

In the Italian context, published data indicates that women pose a satisfactory level of knowledge regarding preconception health and its associated risks may be satisfying, particularly in terms of adopting a healthy lifestyle, including healthy food, exercise, sleeping habits, and avoiding alcohol and smoking [7]. Nevertheless, knowledge does not invariably translate into altered behaviours and is reported to increase significantly following educational interventions. It has been demonstrated that women who receive information by reliable sources tend to exhibit healthier behaviours throughout various phases of their life, leading to improved pregnancy outcomes and diminished likelihood of unintended pregnancies [3, 6, 8]. However, in order to be able to implement targeted interventions, it is imperative to acquire information about the lifestyle, dietary habits and behaviours of this group.

In this context, the aim of this paper is to describe the lifestyles of young women of childbearing age in Italy, encompassing dietary habits, alcohol and tobacco consumption, drug use, and levels of physical activity.

MATERIALS AND METHODS

Research design and setting

This cross-sectional study included young women attending secondary schools and universities in Italy, with data collection taking place from July 2020 to April 2021. The results presented herein are part of a broader project that examined the knowledge, attitudes and health status of young women regarding preconception health and have been published elsewhere [7].

Objectives

The present article aims to:

- describe the diet of young women of childbearing age in the last three days prior to the questionnaire;
- calculate the amount of folic acid consumed through the diet of young women of childbearing age;
- describe the lifestyles and behaviours of young women of childbearing age (such as smoke, alcohol and drug consumption, physical activity);
- to estimate a possible association between knowledge and behaviour of young women of childbearing age regarding preconception health.

Study population

Young women of childbearing age between 18 and 25 years were included in the study. This age group was chosen due to its peak fertility period for women. Furthermore, based on existing literature, these young women are reported to show varying levels of knowledge about preconception health and are considered to be at higher risk of unintended pregnancies [5, 22, 23].

We excluded from the study pregnant women, those who were actively planning a pregnancy and those who had already experienced a pregnancy. The reason behind these criteria was based on the understanding that these categories typically exhibit knowledge and behaviours influenced by their pregnancy experiences [8, 24].

The target population was recruited online. The link to the questionnaire was disseminated and publicised through pages linked to schools and universities, subject to their authorisation and through social media channels.

Questionnaire

The questionnaire employed for data collection was the same used for the broader project. Its development and validation adhered to a three-step methodology. The initial step involved a systematic review to identify the main topics to be addressed in the questionnaire [9]. The questionnaire was composed of the following sections:

1) socio-demographic information;
2) knowledge assessment (comprising issues such as preconception health definition; optimal timing for gynaecological visits; neural tube defects; safety of herbal supplements and teas; obesity, overweight, moderate exercise; alcohol; infectious diseases, including sexually transmitted infections; consumption of folic acid and vitamins; family and genetic history; medications revision; malformations; endocrine disruptors);
3) attitudes (data reported in a separate article [7]);
4) physical health (vaccination status; sexual, mental, emotional, social status, as reported in another article [7]);
5) lifestyles (diet, alcohol, smoke, drugs, exercise). The present article focuses on the part of the questionnaire regarding lifestyles, such as dietary behaviour, alcohol, tobacco and drugs consumption, physical activity. The questionnaire included a vast number of food items which were grouped based on the content of folic acid (in order to be able to calculate the amount of folic acid taken through the diet) [12] and subsequently categorised into broader categories (i.e., fruit, vegetables, fish, whole grains, meat and dairy products) consumed in the three days preceding questionnaire completion.

The questionnaire was afterwards validated through a two-round Delphi procedure, during which 21 experts were asked to rate each item on a Likert scale ranging from 1 (Totally disagree: the question is not relevant at all for the purpose of the questionnaire) to 5 (Strongly agree: the question is very relevant for the purpose of the questionnaire). After two rounds, the questionnaire presented a content validity index of 0.93. The final validation phase included a pilot study of 20 women who provided feedback on the questionnaire, reporting a Cronbach's alpha of 0.99.

Sample size

To calculate the required sample size, we considered a type 1 error of 5%, an absolute error (accuracy) of

2.5% and an expected percentage of preconception health knowledge among young women of 67% [25]. The obtained number was corrected considering an expected response rate of 70%, establishing the need to recruit 485 young women, to reach a final sample size of 340 young women.

Statistical analysis

The data were analysed by descriptive statistical methods using frequencies and percentages (N, %) for all qualitative variables such as: socio-demographic data (nationality, attending school/university, type of university being enrolled in, etc.); diet (consumption of various food types over the previous 3 days, categorised as yes/no and by portions i.e., 1-2 portions, 3-4 portions, >5 portions/day); drug use (including marijuana, cocaine, heroin, ecstasy); types of physical activity practised. Quantitative data were summarised using means and standard deviations (M, SD). Parametric analysis through T-test was used to compare the means of two groups (such as BMI mean among the groups who answered correctly or not to the questions on the negative effects of obesity on pregnancy and the importance of optimizing the weight before pregnancy; data normally distributed). Chi-2 test was used to test for significant association between two categorical variables. Associations with a p-value < 0.05 were considered statistically significant. Statistical analysis was performed with STATA 15 software.

Ethical and administrative procedure

The study protocol was approved by the Ethics Committee of the Fondazione Policlinico Universitario "A. Gemelli", Università Cattolica del Sacro Cuore, Rome, Italy. The approval was emitted on 12/12/2019, number 50160/19 ID 2902.

RESULTS

Characteristics of the study population

The studied population consisted of 340 young women, with a mean age of 21.9 years old (SD = 1.9), 98.2% of Italian nationality, 83.5% was attending school/university, of which 48.4% were enrolled in a health sciences university. More detailed information on the study population is provided elsewhere, as the present article primarily focuses on the dietary and lifestyle aspects of the studied group [7].

Diet and eating habits

A specific dietary regimen was followed by 18.8% of the participants; 4.1% adhering to a vegetarian diet, 1% adopting a vegan diet, 7.6% were following a diet for intolerance to gluten, lactose, etc, 2.9% were going through a hypocaloric diet. Concerning meal frequency, 9.71% consumed fewer than 3 meals/day, 67.9% had 3-4 meals/day, 22.3% had 5 or more meals/day.

In the 3 days preceding the questionnaire compilation, 93.8% consumed pasta or rice, with a mean intake of 78.1 g/day (SD 68.9 g/day; min 0 g/day-max 540 g/day). Additionally, 42.6% had peas or beans, averaging 26.0 g/day (SD 41.1 g/day; min 0 g/day-max 233.3 g/day), 49.41% had broccoli, Brussels sprouts, fava beans, asparagus or spinach, with a mean of 63.3 g/day (SD 95.2 g/day; min 0 g/day-max 583.3 g/day), 73.24% had courgettes, chicory, corn, cauliflower, cabbage, lettuce or beetroot, with a mean of 95.6 g/day (SD 104.1 g/day; min 0 g/day-max 500 g/day), 78.82% had celery, onion, cucumber, aubergine, turnip, radicchio, pumpkin, carrot, tomato, pepper or red cabbage, with a mean of 99.4 g/day (SD 107.6 g/day; min 0 g/day-max 950 g/day) and 50% had potatoes, with a mean of 0.4 potatoes/day (SD 0.62; min 0 potatoes/day-max 5 potatoes/day).

The average quantity of all vegetables consumed over the previous three days (excluding beans and potatoes) was 224.9 g/day (SD 197.4 g/day; min 0 g/day -max 1950 g/day), with 12% of women reporting no vegetable consumption during this period.

In the same timeframe, 43.8% had cereals, bran or sprouts, with a mean of 1 spoon/day (SD 1.4 spoon/day; min 0 spoons/day-max 6.7 spoons/day). Furthermore, 57.6% had milk, with a mean of 108.2 ml/day (SD 132.5 ml/day; min 0 ml/day-max 525 ml/day), 56.18% consumed eggs, with a mean of 0.5 eggs/day (SD 0.63 eggs/day; min 0 eggs/day-max 5 eggs/day), 90.3% had meat, with a mean of 81.3 g/day (SD 57.8 g/day; min 0 g/day-max 291.7 g/day), 80.6% had bread, with a mean of 60.3 g/day (SD 55.5 g/day; min 0 g/day-max 318.3 g/day) and 45.6% had fish, with a mean of 32.9 g/day (SD 48.0 g/day; min 0 g/day-max 300 g/day). The data pertaining to the consumption of various food categories over the preceding three days is presented in *Table 1*.

Over the same three-day period, 81.8% had fruit, averaging 1.1 fruits/day (SD 1 fruit/day; min 0 fruits/day-max 5 fruits/day).

The average consumption of folic acid, calculated based on the types of foods consumed in the last three days prior to filling the questionnaire, according to the values given in Głąbska *et al*., was 341 µg/day [12, 26].

Women who had no cereals in the previous three days were younger (21.6 *vs* 22.2 years old; p-value=0.003), of non-Italian nationality (55.7% of Italian participants consumed no cereals, compared to 100% of women from other nationalities; p-value=0.03) and were more likely to not conduct any physical activity (67.7% of those not consuming cereals did not engage in any physical activity, compared to 46.4% of those participating in any form of physical activity; p-value=0.001). 47.5% of non-smokers did not consume any fish in the previous three days, compared to 71.6% of smokers, p-value<0.001. Furthermore, 27.2% of non-physically active women did not consume any fruits in the last three days, compared to 10.5% of those who engaged in some form of physical activity (p-value=0.006).

Alcohol, tobacco and drug consumption

At the time of data collection, 96 out of 340 women (28.4%) were smokers, starting at a mean age of 16.8 years (SD 2.2; min-max 13-25y). The mean number of cigarettes per day was 5.3 (SD 3.3; min-max 1-16). 60 out of 340 (17.6%) women had previously smoked but had quit, with an average cessation duration of 2.5 years (SD 3.5). In response to questions about current alcohol consumption, 38.8% of the young women gave an affirmative answer. Among the drinkers, 69.5% fa-

Table 1
Consumption of different food categories in the three days prior to answering the questionnaire, including daily Mean and Standard Deviation (SD)

Type of food in the last 3 days	1-2 portions; number (percentage)	3-4 portions; number (percentage)	>5 portions; number (percentage)	Mean (SD)/day	Reference values (for 1500-2500 kcal/day diet)
Pasta/Rice				78.1 (68.9) g	1-1.5/day
50 gr	44 (62.9)	23 (32.9)	3 (4.3)		
80 gr	110 (64.7)	58 (34.1)	2 (1.2)		
100 gr	65 (61.3)	37 (34.9)	4 (3.77)		
150 gr	27 (75)	4 (11.1)	5 (13.9)		
Content of folate in 100 g of pasta/rice is 12 µg – corresponding to 9.37 µg in 78.1 g					
Peas/Beans				26 (41.1) g	3/week
80 gr	74 (92.5)	5 (6.3)	1 (1.2)		
100 gr	46 (85.2)	8 (14.8)			
200 gr	9 (81.8)	2 (18.2)			
400 gr	7 (87.5)	1 (12.5)			
Content of folate in 100 g of peas/beans is 69 µg – corresponding to 17.94 µg in 26 g					
Cereals/bran/sprouts				1 (1.4) spoons	1-3/week
1 spoon	19 (86.3)	3 (13.6)			
2 spoons	35 (66)	14 (26.4)	4 (7.6)		
3 spoons	36 (72)	13 (26)	1 (2)		
4 spoons	18 (69.2)	6 (23.1)	2 (7.7)		
Content of folate in 10 g of cereals/bran/sprouts (1 tablespoon) is 21 µg					
Milk				108.2 (132.5) ml	2-3/day
1/2 glass	46 (75.4)	10 (16.4)	5 (8.2)		
1 glass	29 (63)	16 (34.8)	1 (2.2)		
1 cup	23 (25.6)	50 (55.6)	17 (18.9)		
Content of folate in 250 g of milk is 11 µg – corresponding to 47.61 µg in 108.2 ml					
Eggs				0.5 (063) eggs	2-4/week
1 egg	97 (100)				
2 eggs	84 (100)				
3 eggs	7 (70)	2 (20)	1 (10)		
Content of folate in 50 g (1 egg) of eggs is 32 µg – corresponding to 16 µg in 0.5 eggs					
Meat				81.3 (57.8) g	1/week
100 gr	138 (80.7)	32 (18.7)	1 (0.6)		
150 gr	54 (71.1)	20 (26.3)	2 (2.6)		
200 gr	50 (83.3)	10 (16.7)			
Content of folate in 100 g of meat 10 µg – corresponding to 8.13 µg in 81.3 g					
Bread				60.3 (55.5) g	2.5-4.5/day
80 gr	123 (62.8)	64 (32.7)			
100 gr	30 (56.6)	22 (41.5)	1 (1.9)		
150 gr	6 (40)	5 (33.3)	4 (26.7)		
200 gr	3 (60)	2 (40)			
Content of folate in 35 g of bread is 12 µg – corresponding to 20.67 µg in 60.3 g					
Potatoes				0.43 (0.62) potatoes	1-2/week
1 potato	82 (95.4)	3 (3.5)	1 (1.2)		
2 potatoes	54 (93.1)	4 (6.9)			
3 potatoes	17 (89.5)	2 (10.5)			
Content of folate in 70 g of potatoes (1 potato) is 14 µg – corresponding to 6.02 µg in 0.43 potatoes					

Continues

Table 1
Continued

Type of food in the last 3 days	1-2 portions; number (percentage)	3-4 portions; number (percentage)	>5 portions; number (percentage)	Mean (SD)/day	Reference values (for 1500-2500 kcal/ day diet)
Broccoli/Brussels sprouts/broad beans/asparagus/spinach				63.3 (95.2) g	2-3/day*
100 gr	42 (84)	7 (14)	1 (2)		
200 gr	73 (78.5)	18 (19.4)	2 (2.1)		
300 gr	14 (58.3)	8 (33.4)			
Content of folate in 100 g of broccoli/Brussels sprouts/broad beans/asparagus/spinach is 150 µg – corresponding to 94.95 µg in 63.3 g					
Courgettes/chicory/corn/cauliflower/cabbage/lettuce/beets				95.6 (104.1) g	2-3/day*
100 gr	74 (72.3)	23 (22.8)	4 (4)		
200 gr	69 (60)	44 (38.2)	2 (1.8)		
300 gr	18 (64.3)	7 (25)	3 (10.7)		
Content of folate in 100 g of courgettes/chicory/corn/cauliflower/cabbage/lettuce/beets is 64 µg – corresponding to 61.18 µg in 95.6 g					
Celery/onion/cucumber/aubergine/turnip/radicchio/pumpkin/carrot/tomato/ pepper/red cabbage				99.4 (107.6) g	2.5-3/day*
100 gr	96 (70.1)	38 (27.7)	3 (2.2)		
200 gr	67 (62)	38 (35.2)	3 (2.8)		
300 gr	14 (58.3)	6 (25)	4 (16.7)		
Content of folate in 100 g of celery/onion/cucumber/aubergine/turnip/ radicchio/pumpkin/carrot /tomato/pepper/red cabbage is 26 µg – corresponding to 25.84 µg in 99.4 g					
Fish				32.9 (48) g	2-3/week
100 gr	94 (92.2)	8 (7.8)			
200 gr	36 (85.7)	6 (14.3)			
300 gr	1 (100)				
Content of folate in 50 g of fish is 5 µg – corresponding to 3.29 µg in 32.9 g					
Fruits				1.1 (1) fruits	2-3/day
1 fruit	82 (43.2)	85 (44.7)	23 (12.1)		
2 fruits	31 (46.7)	26 (39.4)	9 (13.7)		
3 fruits	8 (38.1)	9 (42.9)	4 (19)		
Content of folate in 100 g of fruits is 15 µg – corresponding to 30 µg in 1 fruit					

*The recommendation of 2-3/day refers to all vegetables.

voured beer, with 67.2% consuming 1-5 glasses/week and 2.3% more than 5 glasses/week.

Of those who consumed alcohol, 18.6% had never tried beer and 7.7% had started beer consumption before the age of 13, 55.8% started between the ages of 14-17, while 17.8% started at age 18 or older. Furthermore, 5.4% never tried wine, sparkling wine or prosecco, 7.8% started consuming these beverages before the age of 13, 52.7% started between the age 14-17 and 34.1% after reaching 18 years of age. As for cocktails, 12.40% had never tried them, 3.1% initiated cocktail consumption before the age of 13, 63.6% began between the ages 14-17, and 20.9% started at age 18 or older. The consumption patterns of diverse alcohol beverages among participants during a one-week period, along with associated percentages, are delineated in *Table 2*. *Table 3* provides an overview of participants' ages at the onset of alcohol consumption, accompanied by corresponding percentages.

63 of 340 (18.5%) admitted to current drug use, with the most common choice being marijuana (14.7%), most frequently consumed once per month (29 of 63).

Among participants who smoked, 61.5% were also alcohol consumers, compared to 29.9% of non-smokers (p<0.001) and 34.7% of smokers reported drug use compared to 11.9% of non-smokers (p<0.001).

Alcohol consumption was significantly associated to feelings of stress (p=0.015), a history of experiencing violence (p<0.001) and feeling discriminated (p=0.001). Among alcohol consumers 61.4% had experienced some form of violence during their lifetime, compared to 36.1% of non-consumers. Additionally, 35.1% of alcohol consumers reported feelings of discrimination, while only 18.7% of non-consumers did (p=0.001).

Moreover, 31.1% of alcohol consumers also used drugs, compared to 10.1% of non-consumers (p<0.001).

No significant association was found between women who correctly answered the question concerning negative effects of alcohol and women who were using alcohol (p=0.284).

Physical activity and BMI

A total of 182 out of 340 participants (43.5%) engaged in some form of physical activity at the time of

Table 2
Consumption of different kind of alcohol beverages by the participants for one week and percentages

Quantity	No consume	1 gl	2 gl	3 gl	4 gl	5 gl	>5 gl
Beer	22 (19.82%)	48 (43.24%)	27 (24.32%)	5 (4.5%)	2 (1.8%)	4 (3.6%)	3 (2.7%)
Wine	18 (16.36%)	52 (47.27%)	19 (17.27%)	10 (9.09%)	2 (1.82%)	4 (3.64%)	5 (4.55%)
Cocktail	55 (61.8%)	25 (28.09%)	6 (6.74%)	0 (0%)	1 (1.12%)	0 (0%)	2 (2.25%)
Amari	52 (64.2%)	22 (27.16%)	5 (6.17%)	0 (0%)	0 (0%)	0 (0%)	2 (2.47%)
Grappa	67 (89.33%)	6 (8%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (2.67%)

Gl: glasses.

Table 3
Participants' age when they started drinking alcohol and percentages

Age at start	Never	<12 yo	12-13 yo	14-15 yo	16-17 yo	18-19 yo	20-21 yo	>22 yo
Beer	19 (15.32%)	0 (0%)	10 (8.06%)	43 (34.68%)	29 (23.39%)	19 (15.32%)	3 (2.42%)	1 (0.81%)
Wine	4 (3.2%)	0 (0%)	9 (7.2%)	37 (29.6%)	31 (24.8%)	34 (27.2%)	9 (7.2%)	1 (0.8%)
Cocktail	7 (5.83%)	0 (0%)	4 (3.33%)	39 (32.5%)	43 (35.83%)	25 (20.83%)	2 (1.67%)	0 (0%)
Amari	27 (23.28)	0 (0%)	1 (0.86%)	19 (16.38%)	22 (18.97%)	34 (29.31%)	12 (10.34%)	1 (0.86%)
Grappa	52 (46.43)	0 (0%)	0 (0%)	11 (9.82%)	18 (16.07%)	18 (16.07%)	12 (10.71%)	1 (0.89%)

Yo: years old.

data collection, the most frequent being jogging (39%), weightlifting (20.3%), and aerobic gymnastic (30.2%). Among those not currently engaged in physical activity, 94% had previously done so, but discontinued for reasons such as lack of time (72.3%) financial constraints (4.7%), personal preferences (16.9%), COVID-19 pandemic (23%). The prevalence of behaviours among the participants is illustrated in *Figure 1*.

Among women who rated their life satisfaction as 5 (highly satisfied), 74% were engaged in some form of physical activity, compared to those who rated their satisfaction as 1, where 42% participated in physical activity (p=0.01). A higher prevalence of drug use was identified among women who had never participated in sports at some point in their lives, compared to those who did sports (44.4 *vs* 14.9, respectively, p=0.020).

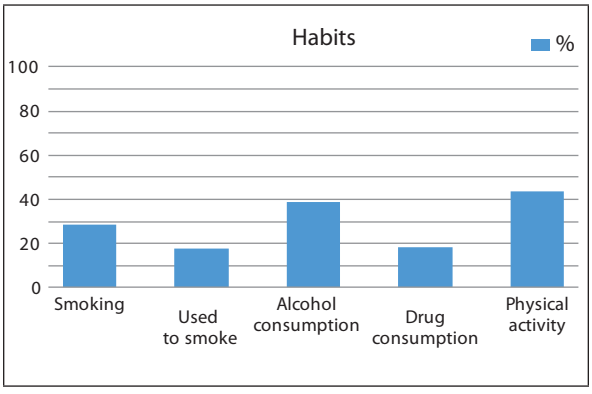

Figure 1
Behaviours of the respondents.

However, no significant association was observed between women who correctly answered the question regarding the importance of weight control before pregnancy and the significance of regular physical activity during pregnancy and their actual engagement in physical activity (p=0.244 and p=0.148, respectively).

Additionally, no significant association was found between the BMI of the participants and their correct answers to questions concerning the adverse effects of obesity on pregnancy and the importance of optimizing weight before pregnancy (p=0.2 and p=0.3, respectively).

An association was identified between BMI and school fulfilment, with a higher prevalence of overweight and obese individuals among those less fulfilled, compared to those who were more fulfilled (30.8% *vs* 19.5% and 15.4% *vs* 0%, respectively, p<0.001). Conversely, a higher prevalence of underweight individuals was observed among the most fulfilled, compared to the least fulfilled (18.8% *vs* 7.7%, respectively, p=0.016). Furthermore, we found an association between BMI and life fulfilment, with higher prevalence of obesity among the least fulfilled, compared to the most fulfilled (14.3% *vs* 0%, respectively, p=0.008).

DISCUSSION

In the past decades, the focus on influencing a child's health through diet has predominantly centred on the mothers' diet during pregnancy. However, there has been a recent shift towards expanding this focus to encompass the dietary and lifestyle choices of adolescents

and young adults', even years before parenthood. In this context, our study provides data on the lifestyles of young women of childbearing age in Italy, including dietary habits, alcohol, smoking, drug consumption, and physical activity.

Our findings indicate that young women aged 18-25 years have a somewhat suboptimal diet, when compared to Italian dietary guidelines. Only 22.3% had 5 or more meals/day, as recommended by the Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA, literally "Council for agricultural research and analysis of the agricultural economy"), which is higher compared to a previous Italian study conducted among students, reporting that only 8.5% ate an average of 5 meals per day [27, 28].

In the Italian population, women aged 18-64 years typically consume 213.1 g/day of vegetables and 429.6 g/day of fruits. The recommendation is to consume a total of 400 g/day or at least 5 portions of fruits and vegetables [27, 29]. In our sample, 41/340 (12%) women did not have any portion of vegetables in the previous three days, and 214/340 (62.9%) had less than 6 portions of vegetables (excluding potatoes or beans) in the previous three days, not meeting the recommended intake of 2-3 portions/day, similar to previous data, which reported that 49.1% of the females meet the recommended fruit consumption [30]. 62/340 (18.2%) of women did not have any fruits in the previous three days and 198/340 (33.2%) had less than 6 portions of fruits in the last three days, also not meeting the recommended amount of 2-3 portions/day. Moreover, 69/340 (20.3%) women had more than 2 portions of meat in the last three days, exceeding the recommended intake of 1 portion/week. These results are consistent with other European studies, such as a Norwegian study including students 20-40 years old, which reported lower than recommended intake of fruits, vegetables, oily fish, and whole grain [30].

The amount of folic acid consumed was 341 µg/day, which is less than the recommended amount of 400 µg/day [12, 26].

Unhealthy lifestyles tend to co-occur, creating a self-reinforcing cycle [31, 32]. We found associations between reduced consumption of cereals and fruits and a lack of physical activity. Additionally, less fish consumption was associated with smoking. Smoking women were more likely to consume alcohol and drugs. Moreover, women who never engaged in sports, were more likely to use drugs.

Our study also revealed significant associations between alcohol consumption and feelings of stress, experiences of violence, feelings of discrimination, as well as physical activity, life satisfaction, and finally BMI and school and life fulfilment.

We investigated whether knowledge on preconception health (results reported in a previous article) could be associated to diet and lifestyle behaviours. However, we found no significant associations between women who correctly answered the question on adverse effects of alcohol and women who consumed alcohol. There was no significant association between women who correctly answered the question on the importance of weight control before pregnancy and the importance of regular physical activity during pregnancy and those engaging in physical activity. Moreover, no significant association was found between participants' BMI and the correct answers to the questions on the adverse effects of obesity on pregnancy and the importance of optimizing the weight before pregnancy. As reported in other studies, often, knowledge is not enough to change unhealthy behaviours or attitudes [33, 34]. This underscores the need for more personalised, targeted and active interventions [35-37].

Considering the substantial impact of lifestyle and behaviours, starting from a young age, on the outcomes of future pregnancies, public health interventions targeting behaviours well ahead of pregnancy could offer significant health benefits at a low cost [38]. Future research should explore how to effectively promote such measures.

The results of this study should be interpreted in the light of some limitations. First, all results are self-reported, which introduces the risk of reporting bias. However, considering that participants tend to over-report healthy foods and behaviours and underreport unhealthy ones, challenges related to lifestyle may be even more substantial than our findings suggest, and public health initiatives aimed at lifestyles in this population of young adults would be even more relevant. The cross-sectional design of the study only allows for the identification of associations, not causality. The questionnaire was filled through an online link and may have attracted only women more attentive to their health in general, and preconception health in particular. We lack information on the participants' residence, therefore we cannot drive to any conclusions regarding differences in lifestyle and diet behaviours among women of childbearing age across different regions of Italy. Considering that access to public structures, counselling centres and sexual education programs varies across Italy, future research could address this issue. Furthermore, we did not investigate fresh foods *vs* processed foods. Lastly, considering the high proportion of respondents enrolled in a health sciences university, there is a probability that higher participation of students from our institution could have influenced sample composition.

Nonetheless, this study has several strong points. The sample size was calculated to ensure adequate statistical power. The questionnaire used for data collection was created based on a systematic literature review and validated through a rigorous process, including a two-round Delphi procedure, and a pilot study. Hence, the questionnaire could serve as a valuable tool, acting as an impetus for future research in the field, not only in Italy, but also in other countries.

CONCLUSIONS

Lifestyles, including diet, alcohol consumption, smoking and physical activity are an important part of maternal and child health and play a crucial role in pregnancy outcomes. These attitudes and behaviours begin at a young age and persist throughout life, ultimately impacting future pregnancies. In our sample young women of childbearing age have a suboptimal

diet, consume alcohol and smoke. To improve maternal and child's health, as well as pregnancy outcomes, preconception lifestyle interventions targeting all women of childbearing age should be warranted. These interventions should include counselling on subjects such as diet, alcohol consumption, smoking and physical activity. Furthermore, policies and guidelines on preconception health should incorporate these aspects to better address the preconception needs of young women of childbearing age.

Conflicts of interest statement

The Authors declare no conflicts of interest.

Received on 23 August 2023.
Accepted on 9 February 2024.

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