

Knowledge, attitudes, and health status of childbearing age young women regarding preconception health - an Italian survey

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Keywords

Preconception health • Knowledge • Attitude • Pregnancy

Summary

Introduction. Preconception health is a public health issue, concerning aspects that could have repercussions on pregnancy outcomes. Despite the importance, often there is a lack of knowledge, particularly among young women. This cross-sectional study aims to evaluate knowledge, attitudes and health status of young women regarding preconception health in the Italian context.

Methods. From July 2020 until April 2021 a validated questionnaire (systematic review, Delphi procedure and pilot study) was administered to a sample of 340 women aged 18 to 25 years, without previous pregnancy and not planning it, attending secondary grade schools and universities. It collected information on knowledge, physical, sexual and mental health. T-test and analysis of variance (ANOVA) were used to determine a significant difference in knowledge mean score (KMS) among different groups.

Results. KMS was 67.6% (SD = 18.1). Participants with Italian nationality, enrolled in a health-field university, with a full-time job, a family income higher than 35,000 €/year and teachers or health providers as information source, had a significantly higher KMS. Only 15.9% of women who saw a gynaecologist in the last year (47.7%) asked about preconception health. 56.5% knew that folic acid is effective in reducing the risk of neural tube defects, while 5.9% was taking it. 82.3% was living in stressing environment. Gender-based discrimination at work, school or family was felt by 25.1%, while 38.2% experienced at least one type of violence.

Conclusions. Promoting preconception health by improving knowledge, attitudes and behaviours may be an impactful possibility to improve women's, children's, and communities' health.

Introduction

Preconception health refers to women's health before they become pregnant. From a public health perspective, the preconception period can relate to a sensitive phase in the life course, such as adolescence, when health behaviours are established, before the first pregnancy [1]. It has received higher attention in the last years [2, 3], considering the importance of knowing how health conditions and risk factors could affect women or their unborn children in the case of a future pregnancy [4, 5]. Preconception health is a very broad concept and embraces different topics, such as management of physical and genetic diseases, proper nutrition, body weight control, healthy lifestyles, mental/emotional and social health [6], all of which could be associated to poorer pregnancy outcomes and could influence offspring's health extending across two or more generations [7]. An optimal preconception health could be achieved through accurate preconception care, which is the provision of biomedical, behavioural and social health interventions (i.e., health promotion, screening, etc.) to women of reproductive age before conception occurs, in order to reduce risk factors [8] and improve woman's and child's health [9].

One of the crucial pillars of promoting preconception health is the knowledge of women, as well as healthcare providers, regarding this topic. In fact, lack of knowledge and awareness could act as barriers for preconception care use [10]. Nevertheless, to date, women's knowledge is not satisfying, and little is said in schools and in environments where health care is provided. According to the current state of the literature, women's knowledge about preconception health is poor, especially if they have never had a pregnancy, do not plan it and are not trying to get pregnant [6, 11].

Particular attention is paid to young women, who are more at risk for unintended pregnancies [12] and generally report a low and uneven level of knowledge on preconception health [13]. As some studies show, despite the information provided on preconception health, many young women have difficulty understanding some aspects. Due to lacking knowledge and education, young women tend to prolong their unhealthy behaviours over time [13]. As reported in literature preventive care for young women might promote some aspects of preconception health, but topics related specifically to pregnancy outcomes might be missed [14]. Hence, the need for targeted strategies to promote preconception health in this population group.

The data on preconception health, in the Italian context,

concern exclusively women planning a pregnancy [15]. Nevertheless, as mentioned above, these women have different needs, knowledge and attitudes regarding preconception health than those who are not planning a pregnancy [11, 16].

Considering the importance of preconception health for women and their offsprings, and the lack of data in the Italian context, the objective of this study is to evaluate the knowledge, attitudes and health status of young women regarding preconception health.

Methods

OBJECTIVES

The primary objective of this study was to assess the level of knowledge on the preconception health of childbearing age young women in Italy. Secondary objectives included studying factors associated to the level of knowledge, evaluating the amount of folic acid consumption, and assessing physical, sexual, mental, emotional, and social health of childbearing age young women.

RESEARCH DESIGN AND SETTING

This was a cross-sectional study, conducted among young women attending secondary grade schools and universities in Italy, from July 2020 until April 2021.

STUDY POPULATION

Young women of childbearing age from 18 to 25 years were included in the study. This age group was chosen as it represents women's most fertile period. In addition, such young women generally report a low and uneven level of knowledge on preconception health, being at higher risk for unintended pregnancies [6, 15, 17].

Pregnant women, those that were planning a pregnancy and women who already had a child were excluded. These categories generally have knowledge and behaviours influenced by the presence of a child already born or on the way, which are different from those of women who are not planning a pregnancy [11, 16].

QUESTIONNAIRE

The questionnaire used for data collection was structured and validated through a three-step methodology. First, a systematic review was conducted to determine the main topics that needed to be investigated within the questionnaire [18]. On this basis, the different sections of the questionnaire were structured including socio-demographic information, knowledge (evaluating knowledge on issues like preconception health definition; gynaecological visit best timing; neural tube defects; herbal supplements and teas safety; obesity, overweight, moderate exercise and alcohol impact; infectious diseases, including sexually transmitted; folic acid and vitamins consumption; family and genetic history; medications revision; malformations; endocrine disruptors), attitudes, physical health (sexual, mental,

emotional, social, vaccination status) and lifestyles (dietary behaviours, risky behaviours, physical activity; data reported elsewhere).

Subsequently, the questionnaire was validated through a two-round Delphi procedure. The 21 experts involved were asked to evaluate each item through 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 step included a pilot study among 20 women who gave feedback on the questionnaire, reporting a Cronbach's alpha of 0.99.

SAMPLE RECRUITMENT

Sample recruitment took place online. The link to the questionnaire was disseminated and publicized through pages linked to schools and universities, subject to their authorization. The link was published on the community pages on the social networks (Facebook) of schools or universities.

SAMPLE SIZE

To calculate the needed 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% [19]. The number obtained 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 through descriptive statistical methods using frequencies and percentages (N, %) for all qualitative variables. Quantitative data were summarized by means and standard deviations (M, SD). Correct answers regarding knowledge questions (20) were coded as "1" and incorrect answers as "0". This allowed us to calculate a total knowledge score for each participant that sums all the scores for each answer. The correct total score was, then, divided by the maximum score (20) and multiplied by 100, to give the correct knowledge mean score (KMS) as a percentage. T-test and Analysis of Variance (ANOVA) were used to determine if there was a statistically significant difference between the KMS (continuous variable) and different variables concerning attitudes and behaviour, with Bonferroni post-hoc analysis. Associations with p-value < 0.05 were considered statistically significant. Statistical analysis was performed using the 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 (SD = 1.9) and with 98.2% being of Italian nationality. 83.5% of the participants was attending school/university, of which 48.4% were enrolled in a health sciences university, 42.2% in a non-health sciences university and the rest in high school. Among the participants, only 17.7% had a part time job and 13.5% had a full-time job. 34.7% of women was single, 59.1% was in a stable relationship, 3.8% had an occasional partner and 2.4% chose not to answer. Subjects lived in families composed by an average of 4 people (SD = 1.4). 35.9% of participants had a family income inferior to 35000 €/year, 18.2% higher than 35000 €/year and 45.9% preferred not to answer.

KNOWLEDGE REGARDING PRECONCEPTION HEALTH

Higher knowledge was identified on topics such as which group of women could benefit from preconception health (90.6%), the negative effects of alcohol on pregnancy (85.3%), the importance of weight control before pregnancy (83.5%), the most effective technique to prevent sexually transmitted diseases (93.8%), the impact of regular physical activity on the foetus (96.5%), the revision of medications with a healthcare provider before pregnancy (94.7%).

Women had a lower level of knowledge regarding the safety of using herbal supplements during pregnancy (25.9%), the diseases that can be contracted due to raw foods (34.1%), when should the use of vitamin supplements be started (29.1%), the effects of endocrine disruptors on reproduction (32.9%) (Tab. I).

The mean knowledge score concerning the 20 questions was 67.6% (SD = 18.1). Participants with Italian nationality, enrolled in a health-field university, who had a full-time job and with a family income higher than 35,000 €/year had a significantly higher mean knowledge score. The mean knowledge score was also higher among subjects who had teachers and healthcare professionals as information source and those who were using at least one contraceptive method (Tab. II).

ATTITUDES REGARDING PRECONCEPTION HEALTH

The vast majority of women (82.1%) had seen a general practitioner in the last year, while only 47.7% had seen a gynaecologist (Tab. III). The main reasons for not seeing a gynaecologist were not having any symptoms, because of shame/fear and not having had any sexual intercourse. Even when a gynaecologist visit took place, only in 15.9% of cases, women asked about preconception health. Only few women were currently taking folic acid (5.9%), while 23.2% was taking additional vitamins (Tab. III). Women who had had a gynaecological examination in the last year had higher mean knowledge score compared

to those who did not have an examination or that had it more than one year before (Tab. II).

PHYSICAL AND SEXUAL HEALTH

Among the participants, 68.4% had a normal Body Mass Index (BMI), 13.9% was underweight and the rest was overweight (17.8%) (Tab. IV). 74.4% of women was not affected by any chronic disease. When a chronic disease was diagnosed, the most frequent were anaemia, asthma and autoimmune diseases and, in 15.9% of cases, a treatment was being followed. The most used therapies were Levothyroxine, the combination Iron + Folic acid and Antiasthmatics. 30% of women suffered from urinary infections, with an average of 2.2 (SD = 1.9; min-max 1-12) episodes in the last year, the majority of whom (88.6%) were treated. A genetic disease in the family was reported by 14.4% of women, among which the most common were diabetes (34.9%), thalassemia (9.3%), coagulopathies (7%), thyroid and cardio-vascular diseases (4.7%, respectively). As for family diseases linked to pregnancy and birth, 51.2% did not report one, while 32.4% did not know and the rest reported at least one disease, the most frequent of which were preterm birth (7.6%), recurrent miscarriage (7.4%) and gestational diabetes (4.4%). Homeopathic substances or natural medicines were being taken by 20.3%. Exposure to Bisphenol A, Pesticides, Solvents and Poly- and Perfluoroalchilic substances had a frequency of 1-4 exposures/month in 45.9%, 25.5%, 28.9% and 25.6% of cases, respectively. Young women reported being vaccinated against Varicella, Measles, Rubella, Mumps, Hepatitis A, Hepatitis B, Meningococcus, Tetanus, Diphtheria, Pertussis, Polio in 47%, 76.5%, 68.5%, 56.2%, 46.8%, 63.5%, 52.6%, 72.9%, 46.2%, 53.3%, 48% of cases, respectively. A vaccine against Human Papilloma Virus (HPV) was administered in 58.8% of cases. Vaccination status was unknown to 24.7% of young women in the sample.

A therapy to regulate the menstrual cycle was followed in 23.8% of cases, 96.7% of which used the estrogen-progestin pill (Tab. V). In 67.9% of cases women had sexual intercourses in the last year, using a contraceptive technique in 91.3% of cases. The most used contraceptive methods were Condom (64.6%), Contraceptive Pill (34.1%) and Coitus interruptus (23.6%). A genital tract infection was reported in 28.9% of cases, with an average of 2.1 (SD = 1.3) episodes in the last year, 86.4% of which were treated mainly with antibiotics (33.3%) and vaginal ovules (23.8%). A sexually transmitted disease was diagnosed in 6.3% of women, most frequently being HPV infection (40%), Genital HSV (herpes simplex virus) infection (20%), Chlamydiosis (13.3%), Candidiasis (13.3%), and treated in 86.7% of cases. 15.6% had a gynaecological disease, which was being treated in 57.6% of cases.

MENTAL AND EMOTIONAL HEALTH

Participants in the study reported the presence of stressing factors in the living environment in 82.3% of cases (Tab. VI). The main strategies to face these

Tab. I. Answers to the 20 questions regarding knowledge of young women on preconception health.

Question	Total	Correct answer, N (%)	Incorrect answers, N (%)
1. Preconception health refers only to women who are planning a pregnancy: Yes/No	340	308 (90.6)	32 (9.4)
2. Preconception health is only important for those who have health problems: Yes/No	340	330 (97.1)	10 (2.9)
3. What is the best time to have a gynaecological visit when thinking of getting pregnant?	340	278 (81.8)	62 (18.2)
4. Which of the following strategies has proven to be effective in reducing the risk of neural tube defects in the foetus such as, for example, spina bifida (birth defect in which there is an incomplete closure of the spine)? (Vitamin A; Folic acid; Calcium; Iron)	340	192 (56.5)	148 (43.5)
5. Are herbal supplements (a plant-based product that is considered useful for the treatment of diseases or for well-being) and herbal teas always safe to consume during pregnancy?: Yes/No	340	88 (25.9)	252 (75.1)
6. When you are pregnant, eating raw foods can increase the risk of contracting diseases such as Toxoplasmosis; Salmonella; Listeria: Yes/No	340	116 (34.1)	224 (65.9)
7. The consumption, even if on one occasion, of a high amount of alcohol, even before being aware of the pregnancy, can cause serious birth defects: Yes/No	340	290 (85.3)	50 (14.7)
8. Obese pregnant women, compared to pregnant women of normal weight, have a higher risk for all of the following clinical conditions, EXCEPT: (Low blood pressure during pregnancy; Gestational diabetes; Miscarriage; Having a baby with a birth defect) : Yes/No	340	201 (59.1)	139 (40.9)
9. Control of weight before pregnancy in overweight or underweight women reduces the risks during pregnancy: Yes/No	340	284 (83.5)	56 (16.5)
10. The most effective technique against sexually transmitted diseases is: (Condom; Estroprogestin pill; Vaginal ring)	340	319 (93.8)	21 (6.2)
11. If a pregnant woman has an active sexually transmitted disease, such as genital herpes or syphilis, can she transmit it to the baby?: Yes/No	340	192 (56.5)	148 (43.5)
12. Which of the following substances are NOT dangerous during pregnancy and have NOT been associated with birth defects or negative pregnancy outcomes (such as miscarriage, prematurity or low birth weight)? (Smoke; Alcohol; Cocaine; Folic acid; Marijuana)	340	225 (66.2)	115 (33.8)
13. ONLY pregnant women should consume folic acid: Yes/No	340	233 (68.5)	107 (31.5)
14. Before a pregnancy, it is advisable for the woman and her partner to retrace their family and genetic history with their doctor: Yes/No	340	295 (86.8)	45 (13.2)
15. Moderate regular exercise (for example, walking for an hour, 3 times a week) can harm the foetus: Yes/No	340	328 (96.5)	12 (3.5)
16. When looking for a pregnancy, the medications taken should be reviewed with the doctor: Yes/No	340	322 (94.7)	18 (5.3)
17. When should the use of vitamin supplements be started?	340	99 (29.1)	241 (70.9)
18. During which trimester of pregnancy the developing embryo/foetus is most at risk of malformations due to exposure to harmful substances	340	167 (49.1)	173 (50.9)
19. When pregnant it is risky to come into contact with animals such as the cat: Yes/No	340	207 (60.9)	133 (39.1)
20. What can endocrine disruptors (substances that alter the normal hormonal function of the endocrine system, such as the thyroid, ovary, pancreas.) cause	340	112 (32.9)	228 (67.1)
Mean Total Knowledge		67.6% ± 18.1%	

stressors emerged to be elaborating stressing factors to not let them become a problem (51.8%) and looking for relatives/friends' help (23.6%). Most participants (63.7%) had never consulted a mental health specialist in their life. In 16.7% of women a mental disorder was diagnosed, most frequently being anxiety and depression (10.3% and 2.9%, respectively). Only 23.7% of women with a mental disorder diagnosis was under treatment. 38.2% of women experienced, at least, one type of violence during their life, the most common being verbal

(26.2%) and psychological (23.8%), for which they chose to talk mainly to their parents (43.2%) and friends (37.5%). Gender-based discrimination at work, school or family was felt by 25.1% of participants, according to which, men have more advantages at work (54.7%), and at school and work (19.4%). Women felt averagely fulfilled at home (3.9 ± 1.1), at school/university and in the social context they live in (3.5 ± 1.0 , respectively), and less at work (2.9 ± 1.2).

Tab. II. Knowledge regarding preconception health and variables associated to it.

Variable	Total	Number of participants	Mean knowledge	SD	p-value
Nationality	340				0.006
Italian		334	67.9	17.9	
Other		6	49.2	22.7	
Attending school/university and field	267				< 0.001
High school		18	58.3	17.3	
Health field university		133	79.1	14.1	
Non health field university		116	57.5	14.6	
Not specified		8	65.6	18.9	
Employment	338				< 0.001
No		232	69.7	16.9	
Part time		60	57.8	18.0	
Full time		46	70.5	20.2	
Family income	340				< 0.001
< 35000 €/y		122	65.6	18.1	
> 35000 €/y		62	75.4	18.2	
Prefers not to answer		156	66.0	17.4	
Source of information of those who have heard of preconception health	180				< 0.001
Social network (Instagram, Facebook, etc.)		14	56.4	8.8	
Internet or medical websites		46	68.2	18.1	
Family		14	64.6	16.2	
Healthcare professionals (obstetricians, nurses, doctors...)		75	75.8	15.2	
Teachers		16	75.9	12.8	
Books or magazines		9	75.6	15.1	
Other		6	61.7	19.1	
Gynaecological examination	340				0.005
No		80	64.9	16.1	
Yes, in the last year		162	70.9	18.4	
Yes, more than one year ago		98	64.2	18.4	
BMI	339				0.001
Below 18.5		47	71.9	17.6	
18.5-24.9		233	67.9	17.4	
25.0-29.9		46	65.1	19.5	
30.0-34.9		6	50.0	13.4	
35.0-39.9		3	80.0	8.7	
Above 40		4	41.3	27.2	
Contraceptive technique used among those who have had sexual intercourse in the last year	229				< 0.001
At least one		209	70.4	17.2	
None		20	53.3	15.5	

Discussion

The present study aimed at assessing the knowledge, attitudes and health status of young women regarding preconception health, considering its importance for women and their offspring [9], the lack of data in the Italian context and the fact that information on knowledge and associated gaps could serve as starting point for any future intervention.

Participants in this study had higher knowledge on topics such as, which group of women could benefit from preconception health, the negative effects of alcohol on pregnancy, the importance of weight control before

pregnancy, the most effective technique to prevent sexually transmitted diseases, the impact of regular physical activity on the foetus, the revision of medications with a healthcare provider before pregnancy. However, there are some topics that were less known to young women, such as the safety of using herbal supplements during pregnancy, diseases that can be contracted due to raw foods, when should the use of vitamin supplements be started, the effects of endocrine disruptors on reproduction, in line with the published literature [20]. In our sample the level of knowledge was significantly associated to Italian nationality, health-field university, job, yearly family income and information source. This

Tab. III. Attitudes of participants regarding preconception health.

Variable	Total	Number for each group	%
General practitioner examination in the last year	340		
No		61	17.9
Yes		279	82.1
Gynaecological examination	340		
No		80	23.5
Yes, in the last year		162	47.7
Yes, more than one year ago		98	28.8
If not, why?	46		
Did not need it		29	63.0
Because of shame/fear		5	10.9
Own mother never spoke about it		3	6.5
Never had intercourse		3	6.5
Tends to procrastinate		2	4.4
Not looking for pregnancy		1	2.2
Does not know		3	6.5
Asked a gynaecologist about preconception health	340		
No		286	84.1
Yes		54	15.9
Dental examination in the last year	340		
No		102	30.0
Yes		238	70.0
Folic acid consumption	340		
No		320	94.1
Yes		20	5.9
Additional vitamins	340		
No		261	76.8
Yes		79	23.2
Which vitamins	64		
D Vitamin		21	32.8
B12 Vitamin		5	7.8
C Vitamin		7	10.9
Iron		2	3.1
Multivitamin		28	43.8
A Vitamin		1	1.6

asserts the importance of socio-demographic variables on women's preconception health, as reported also by published literature, to increase health equity and provide the same possibilities also to disadvantaged population groups [11, 21, 22].

Less than half of the participants had seen a gynaecologist in the last year and only few of them had talked about preconception health. Healthcare professionals remain one of the most important sources of information, however a gynaecological visit is not always associated to better knowledge regarding preconception health. Therefore, there is a need to promote the importance of preconception care among health providers, since they play a crucial role in supporting young women and addressing health issues in clinical consultations [23, 24]. Only 5.9% of women in our sample were taking folic acid, even if 56.5% knew that folic acid has been shown to be effective in reducing the risk of neural tube defects in the foetus. The vast majority of participants (68.5%)

thought that only pregnant women should take folic acid. Based on this, it should be noted that folic acid remains an issue to be addressed within preconception health and there is the need for more targeted interventions which should focus not only on increasing women's knowledge, but also changing their attitudes and behaviours, since not always higher knowledge translates into improved behaviours.

Several participants reported being diagnosed with chronic, genetic or sexually transmitted diseases. Lack of knowledge could perpetuate unhealthy behaviours, as for example, in our sample, a relatively high percentage of women were using coitus interruptus or contraceptive pill which exposes them to sexually transmitted diseases and unplanned pregnancies. Furthermore, almost 1/4 of the sample did not know their vaccination status. This highlights the importance of regularly checking with a healthcare professional to control the health status, and receive the right information not only before planning a

Tab. IV. Physical health of young women in childbearing age.

Variable	Total	Number for each group	%
BMI	339		
Underweight (Below 18.5)		47	13.9
Normal weight (18.5-24.9)		232	68.4
Pre-obesity (25.0-29.9)		46	13.6
Obesity class I (30.0-34.9)		6	1.8
Obesity class II (35.0-39.9)		3	0.9
Obesity class III (Above 40)		5	1.5
Chronic disease	327		
None		253	74.4
Anemia		22	6.5
Asthma		8	2.4
Autoimmune diseases		6	1.8
Other		27	8.0
Does not know		11	3.2
Drugs or treatments for chronic disease	293		
No		247	84.3
Yes		46	15.7
Urinary infections in the last year	340		
No		231	67.9
Yes		102	30.0
Does not know		4	1.2
Prefers not to answer		3	0.9
Treatments for urinary infections	105		
No		12	11.4
Yes		93	88.6
Genetic disease in family	340		
No		237	69.7
Yes		49	14.4
Does not know		51	15.0
Prefers not to answer		3	0.9
Homeopathic substances, integrators or natural medicines	340		
No		271	79.7
Yes		69	20.3
Exposure to Bisphenol A	283		
1-4 exposures/year		67	23.7
1-4 exposures/month		130	45.9
1-4 exposures/week		82	29.0
More than 4 exposures/week		4	1.4
Exposure to Pesticides	275		
1-4 exposures/year		73	26.6
1-4 exposures/month		70	25.5
1-4 exposures/week		94	34.2
More than 4 exposures/week		38	13.8
Exposure to Solvents	273		
1-4 exposures/year		44	16.1
1-4 exposures/month		79	28.9
1-4 exposures/week		110	40.3
More than 4 exposures/week		40	14.7
Exposure to Poly- and Perfluoroalchilic substances	289		
1-4 exposures/year		56	19.4
1-4 exposures/month		74	25.6
1-4 exposures/week		79	27.3
More than 4 exposures/week		80	27.7
Family history of disease linked to pregnancy and birth (multiple answers)	379		
Recurrent miscarriage		25	7.4
Preterm birth		26	7.6
Pregravidic or gestational diabetes		15	4.4
Gestational or chronic hypertension		8	2.4
Autoimmune diseases		5	1.5
Preeclampsia		5	1.5
Other		11	3.2
None		174	51.2
Does not know		110	32.4

Tab. V. Sexual health of childbearing age young women.

Variable	Number	%
Age first menstrual cycle (mean \pm SD)	12.3 \pm 1.5	
Drugs to regulate the menstrual cycle		
No	255	75.0
Yes	81	23.8
Does not know	1	0.3
Prefers not to answer	3	0.9
Sexual intercourses in the last year		
No	103	30.3
Yes	231	67.9
Prefers not to answer	6	1.8
Use of contraceptive methods		
No	20	8.7
Yes	209	91.3
Contraceptive method		
Condom	148	64.6
Contraceptive Pill	78	34.1
IUD	3	1.3
Sexual abstinence	6	2.6
Coitus interruptus	54	23.6
Other	8	3.5
Genital tract infections in the last year		
No	161	67.9
Yes	66	28.9
Does not know	8	3.4
Prefers not to answer	2	0.8
How many infection episodes		
1-3	37	86.0
> 3	6	14.0
Treatments for genital infections		
No	8	12.1
Yes	57	86.4
Prefers not to answer	1	1.5
Sexually Transmitted Diseases in the last year		
No	218	92.0
Genital HSV infection	3	1.3
HPV infection	6	2.5
Chlamydia	2	0.8
Candidiasis	2	0.8
Condyloma	1	0.4
Ureaplasma urealyticum infection	1	0.4
Does not know	3	1.3
Prefers not to answer	1	0.4
Treatment for STDs		
No	2	13.3
Yes	13	86.7
Gynaecological disease		
None	281	82.9
Endometriosis	3	0.9
Polycystic Ovary Syndrome (PCOS)	46	13.6
Uterine polyps	2	0.6
Myomas	2	0.6
Prefers not to answer	5	1.5
Treatments for gynaecological disease		
No	25	42.4
Yes	34	57.6

Tab. VI. Mental and emotional health of young women in childbearing age.

Variable	Number	%
Stressing factors present in the living environment		
No	60	17.7
Yes	280	82.3
Strategies to face stressing factors		
Ignoring them	12	4.4
Trying to elaborate them to not let them become a problem	143	51.8
Does not manage to face them and they become a problem	31	11.2
Looking for professional help	5	1.8
Looking for relatives/friends' help	65	23.6
Does not know how to behave	20	7.3
Consulting a specialist for mental health		
Never	216	63.7
Psychologist/Psychiatrist	109	32.2
General practitioner/Gynaecologist	4	1.2
Prefers not to answer	10	3.0
Mental disorder diagnosed		
No	280	82.4
Anxiety	35	10.3
Depression	10	2.9
Mood disorder	4	1.2
Other	8	2.4
Prefers not to answer	3	0.9
Treatments for mental disorder at the moment		
No	45	76.3
Yes	14	23.7
Violence suffered		
No	184	54.1
Physical	22	6.5
Psychological	81	23.8
Verbal	89	26.2
Sexual	17	5.0
Prefers not to answer	26	7.7
Ever talked with someone about violence		
No	224	66.5
Yes	113	33.5
With whom have talked about violence		
Parents	38	43.2
Siblings	5	5.7
Family	11	12.5
Friends	33	37.5
Partner	13	14.8
Professors	16	18.2
Psychologist	18	20.5
Gender based discrimination		
No	254	74.9
At school	49	14.5
At work	28	8.3
Within the family	31	9.1
More advantages for men		
No	80	23.5
At school	8	2.4
At school and at work	66	19.4
At work	186	54.7
Feeling fulfilled at school/university (mean \pm SD; min-max 1-5)		3.5 \pm 1.0
Feeling fulfilled at work (mean \pm SD; min-max 1-5)		2.9 \pm 1.2
Feeling fulfilled at home (mean \pm SD; min-max 1-5)		3.9 \pm 1.1
Feeling fulfilled in social context (mean \pm SD; min-max 1-5)		3.5 \pm 1.0
Life satisfaction (mean \pm SD; min-max 1-5)		3.4 \pm 0.9

pregnancy, but anytime in women's lifespan [25].

An important role in the preconception care is played by mental health, which influences pregnancy outcomes, women's and children's health and should be addressed. More than 2/3 of women in our sample was living in a stressful environment, in most cases not knowing how to face this stress. Furthermore, more than 1/3 of women experienced at least one type of violence during their life, the most common being verbal and psychological, asking, more often, their parents and friends for support.

The results of this study are important since they refer to a particularly vulnerable population, with a higher risk for unhealthy behaviours and unintended pregnancies, and they could be a starting point to provide information for targeted interventions to increase the knowledge and improve attitudes and behaviours of young women concerning preconception health. From a public health point of view interventions implemented in such a young population group could have an even greater impact on preconception health [26] and would bring a long-lasting positive effect on women's and children's health [27]. Nevertheless, higher knowledge and awareness are not always associated to modified behaviours, which calls for personalized, targeted interventions, based on evidence and women's preferences, in order to have a greater impact [28]. In this context this study provides input and could act as impetus for future interventions, which should focus on disseminating knowledge on topics such as diseases that can be contracted due to raw foods, vitamin and herbal supplements be started, endocrine disruptors, the importance of talking to a healthcare provider about preconception health, taking folic acid, controlling health conditions and therapies. As previously reported by women themselves, interventions could include having access to reputable and easily accessible online sources of preconception health information, education at secondary schools and public health campaigns, considering women's personal preferences for accessible and tailored preconception health information and support at individual, interpersonal, community and organizational levels [29, 30].

As reported also by the Centers for Disease Control and Prevention (CDC) recommendations, the goal of preconception care and services should be to improve the knowledge, attitudes and behaviours of women related to preconception health, assure that all women of childbearing age receive preconception care services (i.e., evidence-based risk screening, health promotion, and interventions) that will enable them to enter pregnancy in optimal health and reduce the disparities in adverse pregnancy outcomes [8].

The results of this study should be interpreted in the light of some limitations. Firstly, the cross-sectional design does not permit to report causality, but only association between the level of knowledge and the different variables. The questionnaire was filled through an online link and only women more attentive to their health in general, and preconception health in particular,

may have answered, which could have introduced a bias. Moreover, since all measures were self-reported and health is a sensitive issue, it is possible that there was a response bias.

However, this study has several strong points. To the best of our knowledge, it is the first to explore knowledge, attitudes, behaviours and health status of young Italian women. The sample size was calculated for the study to have the appropriate statistical power. The questionnaire used to collect the data was created based on a systematic literature review and validated through a two-round Delphi procedure followed by a pilot study. Hence, the questionnaire could be a useful tool, acting as an impetus for future research in the field, not only in Italy, but also in other countries.

Conclusions

Poor preconception health could create health disparities across the globe or attenuate already existing ones [31]. That is why promoting preconception care by improving knowledge, attitudes and behaviours is seen as an impactful possibility to reduce inequalities and improve women's, children's and communities' health. Women in our sample lacked knowledge in several issues regarding preconception health, had some unhealthy attitudes and behaviours and needed guide by their healthcare providers on this topic. Healthcare providers, including midwives, gynaecologists, general practitioners, nurses, etc., and teachers play an important role as the main sources of information regarding preconception health. Through information campaigns, it would be advisable to encourage young women to see their health professionals, to check their status health and improve their knowledge, not only before becoming pregnant, but in every moment of their fertile life, in order to avoid unhealthy behaviours. The consumption of folic acid before pregnancy remains an issue of preconception health, and it deserves particular attention in information campaigns. It is important to integrate preconception health promotion into the continuum of women's healthcare through raising awareness, providing information, improving clinical practice, and providing high quality research to inform policy makers and guidelines [32].

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Conflict of interest statement

The Authors declare no conflicts of interest.

Authors' contributions

DZ and MLDP conceived the research hypothesis and designed the study. DZ, AO, AMV, MLDP contributed to build the questionnaire. DZ and ELG performed the statistical analysis. DZ, ELG, AO, AMV wrote a first draft of the manuscript and MLDP revised the work for important intellectual content. All authors gave the final approval of the version to be published, and agreed on all aspects of the work, especially concerning its accuracy and integrity.

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