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"YOUTH AND INFERTILITY: AN ITALIAN STUDY"

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SUMMARY

"YOUTH AND INFERTILITY: AN ITALIAN STUDY"

Infertility is the inability to conceive after one year of unprotected sexual intercourse and is a global public health issue. The lack of information on infertility from experts is a constant and sources of information can therefore have different and sometimes opposite impacts on the perception of risk. The time spent by young people at university is a phase of maturation and transition to adulthood. It is therefore very important to assess how and to what extent university students consider their future fertility/infertility and what and how much knowledge they have about their lifestyles and the direct and indirect impact these can have on infertility. For these reasons, this study has sought to examine the information and perception on the subject of infertility in a sample of Italian university students.
The survey tool was a structured questionnaire on line and 2268 valid questionnaires had been collected. Three themes of analysis had been identified: information on infertility, the lifestyles most at risk for infertility, the perception of the risk of infertility, and the consequent actions in case of diagnosis of infertility or suspicion of infertility. The gender difference and the faculty attended has significant effect on these data. With regard to the perception of the risk of infertility is confirmed the bias of juvenile optimism.

Key words: Youth - Infertility - Information - Perception of risk

Background

Infertility is defined as the inability to conceive after one year of unprotected sexual intercourse and is a global public health issue[1]. The risk of infertility increases as a woman ages (>35 years).Genetic abnormalities, hormonal imbalances, infections, malformations of the reproductive tract are among the most frequent causes of male and female infertility. In addition, there are lifestyle factors such as obesity, diet, smoking, alcohol use/abuse, environmental exposures, which can affect the fertility dynamics of individuals[2]. Moreover, the increase in the age at which one decides to have children and sexually transmitted diseases also constitute important risk factors for infertility.

Knowledge of male and female risk factors for infertility is the first step to preserving one' s fertility and to modifying any improper life-style habits. According to Bunting & Boivin[3], young people - with a high level of education - are aware that negative lifestyles reduce fertility but at the same time they are not able to truly recognize the factors that are related to reproduction, including false myths and healthy habits. Perhaps this is because young people use their knowledge about lifestyles that negatively affect health in general as a basis for making assumptions and correlations about possible effects on fertility. Other research has also shown that young people have little information or knowledge about infertility, its causes and how to prevent it[4]. In Western countries, the average age of women at first pregnancy is increasing and this could also be caused by a poor understanding regarding the age infertility decline. On the other hand, the discrepancy between the fertility ideals of couples and reality is increasingly evident, suggesting that there are external forces that influence the choice of motherhood and the decision to delay the time of first delivery to an even greater extent. Giving priority to work and other life choices that overshadow the decision to start a family can also be reinforced by the assumption that

its impacts can be mediated through medical practices, such as the use of medically assisted procreation and the recent practice of elective freezing of eggs. Often, in fact, a lack of in-depth knowledge of these practices can lead couples to believe that these are infallible solutions for achieving the objective of reproduction, and, moreover, without any risk to their health[5].

The lack of information on infertility from health care experts is a constant. According to the Department of Economics, University of Gothenburg[6] the media provide more information on infertility to women of all ages, while only 1 in 4 women received such information from the Health Service. Friends and relatives are also an important source of information influencing women's perception of risk, but this also often leads to its being overestimated. However, circumstances are different if the information is given by friends or relatives who have experienced pregnancy after the age of 35, as this leads to a greater awareness and proper knowledge of the risks of infertility. Sources of information can therefore have different and sometimes opposite impacts on the perception of risk.

The time spent by young people at university is an opportunity for self-discovery and the development of independence[7]. It is also a phase of maturation and transition to adulthood, which includes sexual experience and avoiding unwanted pregnancies[8]. Many studies have shown that university students stress that completing training and having a stable career are the prerequisites for dealing with the possible birth of children[9]. It is therefore very important to assess how and to what extent university students consider their future fertility/infertility and what and how much knowledge they have about their lifestyles and the direct and indirect impact these can have on infertility. For example, many studies confirm that the university period presents a particular risk for unprotected sexual intercourse and the consequent spread of sexually transmitted diseases in Italy[10,11], in Sweden[12,13], in Finland[14] in the United States[15], in England[16], in Israel[17], and in Canada[18].

For these reasons, this study has sought to examine the information and perception on the subject of infertility in a sample of Italian university students.

Methods

The statistical universe of reference of the research is made up of all the students regularly enrolled in the three-year and master degree courses of the La Sapienza University of Rome in the academic year 2018/2019. The student population was reached through a call for participation forwarded to the institutional mailing list reserved for it, used by La Sapienza as a channel of preferential communication with students (19). The research was approved by the Rector of the University. The content of the message, kept active in the period January-March 2019, contained a brief summary of the objectives of the research and a link to the web page of access to the online questionnaire, prepared in the Google Forms environment. The survey tool was a structured questionnaire divided into three macro-areas:

1. information and perception regarding the subject of infertility
2. reproductive project;
3. socio-demographic information.

For some questions the *multi-response* mode was provided, with the addition of a residual category [other] in which the respondent was free to type the answer considered most appropriate[20]. At the end of the matrix control and adaptation procedures, 29 variables were obtained that were technically functional to the descriptive operations typical of standard sociological research. The analysis of the data was first carried out on the distribution of the frequencies of each single indicator and then on the construction of significant intersections[21].

The total university population in the academic year 2018/19 was 101,071 students; at the end of the survey period 2268 valid questionnaires had been collected (equal to a response rate of 2.24%).

Results

Demographics

The questionnaire was answered by 2268 students, of whom 73% are women and 27% men. 53% are over 22 years of age, while 47% of the sample are between 18 and 22 years of age. Only 25 % of the sample defines themselves as student workers, while the remaining 75 % do not work. 40% of the sample is made up of non-resident students while the remaining 60% are resident students (Tab. 1).

Tab. 1. Distribution of the sample by main socio-demographic characteristics

Gender	*Female*	*Male*	*Total*
Absolute values	1655	613	2268
Percentage values	73	27	100
Age	*18-22*	*23 and above*	*Total*
Absolute values	1061	1207	2268
Percentage values	46,8	53,2	100
Residence	*Resident*	*Non-resident*	*Total*
Absolute values	1347	921	2268
Percentage values	59,4	40,6	100
Student worker	*Yes*	*No*	*Total*
Absolute values	567	1701	2268
Percentage values	25	75	100
Faculty	*Medical*	*Other*	*Total*
Absolute values	768	1500	2268
Percentage values	33,9	66,1	100

The university departments to which they belong have been divided into three categories: technical-scientific departments, schools of medicine and humanities. The sample interviewed is equally distributed among the three categories, reporting 35.7% at the technical-scientific faculties, 33.9% at the medical faculties and 30.5% at the social-humanistic faculties (Tab. 2).

Tab. 2. Distribution of the sample by type of university faculty attended (disaggregated)

Faculty	*Medical*	*Social-Humanistic*	*Technical-Scientific*	*Total*
Absolute values	768	691	809	2268
Percentage values	33,9	30,5	35,7	100

66% of the sample responded that they had already done a specialist check-up (andrological/gynaecological). Of these, 40% stated that the reason for the visit was a routine check-up after their first intercourse, while 35.5% of the cases reported that there were anomalies. Only 5.7% of the respondents went to the specialist out of fear of having contracted a sexually transmitted disease.
51% of the respondents intend to have children. In this regard, the majority of respondents (72%) emphasize that in order to decide to have children it to have financial resources, and 22.8% reiterate that it is necessary to have a job. Only in 4.8% of cases is the involvement in a stable affective relationship considered a determining factor.

Infertility Knowledge: The Information

60% of the total responded that they had never been informed about infertility. In this respect, it is interesting to note that gender is not a significant parameter on general information (Tab. 3): the members of the female and male subgroups who responded that they were informed showed minimal differences (40.8% against 37.7%).

Tab.3. Information on the subject of fertility by gender (percentage values)

Have you ever inquired about the subject of fertility?	*Female*	*Male*	*Total*
No	59,2	62,3	60
Yes	40,8	37,7	40
Total	100	100	100
N	1655	613	2268

χ^2 sign. for p<0,17 (not significant)

Among the 40% of those who claim to have inquired about the subject, the sources of information are as follows: 22% of the sample chooses the scientific texts, followed by 8% who use the media and 7% and 4% who turn respectively to family and friends.
Unlike gender, the faculty attended by respondents would seem to be a fairly discriminating element with respect to the search for information (Tab. 4): in this case, students enrolled in medical degree courses declare to have been informed in 53% of cases, against percentages ranging from 32% to 35% of those enrolled in courses in the technical and humanistic area. The attendance of medical schools also favours a significant prevalence in the search for information through scientific texts compared to other students (35% compared to 15% of other faculties), as can be seen from the results summarised in Tab. 5.

Tab. 4. Information on the subject of fertility by faculty (percentage values)

Have you ever inquired about the subject of fertility?	*Medical*	*Other*	*Total*
No	47,4	66,3	60
Yes	52,6	33,7	40
Total	100	100	100
N	768	1500	2268

χ^2 sign. for p<0,00

Tab. 5. Sources of information on fertility by university department (percentage values)

What are your sources of information?	*Medical*	*Other*	*Total*
I do not inform myself	47,4	66,3	60
Friends	3,8	3,9	3,9
Family	6,4	6,9	6,7
Media	7,7	7,9	7,8
Scientific tests	34,8	15	21,6
Total	100	100	100
N	768	1500	2268

χ^2 sign. for p<0,00

Infertility Knowledge: The Lifestyle Risk Factors

To the question: What is it useful to prevent infertility?, 52% of respondents said that to prevent infertility it is useful to stay informed about reproductive health, while 24% said that it is necessary to undergo annual screening and 18% that it is important not to smoke. In this case, the gender variable plays a quite important role in the evaluation of prevention factors: males consider it useful not to smoke more than females (25.3% against 15.9%), who instead prevail in the data of active information on reproductive health (54.8% against 44.5%, Tab. 6).

Tab. 6. Infertility prevention factors by gender (percentage values)

What is the most useful thing to do for the prevention of infertility?	*Female*	*Male*	*Total*
Not smoking	15,9	25,3	18,4
Undergoing annual screenings	24,8	22,2	24,1
Keeping informed about reproductive health	54,8	44,5	52
Other	4,5	8	5,5
Total	100	100	100
N	1655	613	2268

χ^2 sign. for p<0,00

Infertility Knowledge: The Risk Perception

The personal risk of experiencing problems related to infertility is considered, by the interviewees, to be basically lower than that of peers of the same sex, although not by much: specifically, observing the cumulative percentages (Tab. 7), this refers to a personal risk perceived as medium/high in 43% of cases, against 52% of their peers, while the difference in the case of a low risk is slightly more marked (34% for themselves, 21% for others). However, the proportion of those who do not raise the problem of reproductive health is quite high (24% and 28%).

Tab.7. Perception of subjective and same-sex peer risk of having fertility problems

Risk for oneself	*High*	*Medium*	*Low*	*I do not think about it*	*Total*
Absolute values	166	805	762	535	2268
Percentage values	7,3	35,5	33,6	23,6	100

Risk for others	*High*	*Medium*	*Low*	*I do not think about it*	*Total*
Absolute values	193	978	468	629	2268
Percentage values	8,5	43,1	20,6	27,7	100

Infertility Knowledge: The Action

56% of the sample, if they suspected that he/she or their partner was infertile, would go to a specialist, while, in the case of a diagnosis of infertility, 33% would resort to adoption and 25% to medically assisted procreation. The percentage of those who would give up becoming parents is very low (4.5%).

With respect to these two important circumstances, it is necessary to point out the effect of gender and of the university faculty of affiliation. As far as the suspicion of infertility is concerned (Tab. 8), the girls would talk to a specialist much more than the boys (62% of the cases against 41%), who seem to be more inclined to address the

issue with the general practitioner (44% against only 25% of their peers). Faced with a certified diagnosis, on the other hand, the typology of the studies undertaken is incisive: students in the medical area place greater trust in the techniques of medically assisted procreation (32% compared to an average of 22% of other students), while students in other faculties in 35.5% of cases would have recourse to adoption, with those enrolled in the medical area being 28% (Tab. 9).

Tab.8. Who to turn to in case of suspected infertility by gender (percentage values)

Who would you turn to in case of suspected infertility?	*Female*	*Male*	*Total*
Specialists	62,2	40,9	56,5
General Practitioner/NHS	25	44,4	30,2
Other	12,8	14,7	13,3
Total	100	100	100
N	1655	613	2268

χ^2 sign. for p<0,00

Tab.9. What to do in case of diagnosis of infertility by faculty attended (percentage values)

What would you do if you were diagnosed with infertility?	*Medical*	*Other*	*Total*
Recourse to Medically Assisted Procreation	31,6	22,3	25,4
Adoption	27,7	35,5	32,7
Renounce becoming a parent	2,6	5,4	4,5
Other	38	36,8	37,4
Total	100	100	100
N	768	1500	2268

χ^2 sign. for p<0,00

Discussion

Infertility is an important public health issue[22,23,24,25]. This study aims to evaluate, on a sample of university students, the information and perception regarding the theme of infertility and the reproductive

project more generally. In relation to this general framework, three themes of analysis have been identified: information on infertility, lifestyles that can increase the risk of infertility, the perception of the risk of infertility, and the consequent actions in case of diagnosis of infertility or suspicion of infertility.

Compared to the issue of information on infertility in general, the percentage of interest among young people is still low. However, it is interesting to note that scientific texts, and not general media, are the primary sources of information, as one could have assumed[26,27,28]. Probably the sample of university students may have had played a role in this respect. It should also be stressed that while gender difference has no significant effect on these data, the department of survey interviewees is a fairly discriminating element both with respect to the search for information and with respect to the sources of information. In particular, medical school students are more informed, and appear to resort to scientific papers, compared to peers enrolled in other university departments. The data can be partly justified with respect to the subject in question, which may encounter more sensitivity and knowledge in students who, in their normal course of study, are already solicited on these topics on a daily basis[29].

With reference to the theme of the riskiest lifestyles associated with infertility, it is interesting to note that most of the interviewees claim that it is useful to stay informed about reproductive health in order to prevent this problem, even if this finding is true for women more than for men[30,31,32]. On the other hand, not smoking is more important for men. In this regard, it should be noted that the spontaneous selection of a male percentage of almost 30% of the total can be considered a good result, also taking into account similar research on the subject[33,34].

With regard to the perception of the risk of infertility, a finding already present in the literature is confirmed, according to which the one's own risk of infertility problems is considered, by respondents,

lower than that of peers of the same sex[35,36,37]. However, the most interesting finding is that the proportion of those who do not raise the problem of reproductive health at all for themselves and their peers is still quite high.

Finally, with reference to consequent actions in the case of diagnosis of infertility or suspicion of infertility, it should be noted that the share of those who would give up on becoming parents is very low, since almost everyone would try to find a solution (adoption or Medically Assisted Procreation). Nevertheless, it is interesting to note that in the event of difficulties, women are more likely than men to consult a specialist and therefore approach the problem with greater responsibility. In contrast, medical students are more willing to resort to a medicalized path than students in other disciplinary areas who would be more willing to accept adoption. This could be a sign that cultural approach, health literacy and scientific knowledge, have a considerable impact not only on the way in which information is provided on infertility but also on choices and consequent actions[38,39].

Conclusions

Infertility is an important public health issue. This research has shown that young people do not want to give up becoming parents and are becoming more sensitive to the issue. It is also worth noting that when they seek information it is mainly through scientific sources (at least in this university sample), although it is necessary to continue to increase information and awareness on the subject. In particular, it is necessary to involve the target group of young men more closely.

The research has also shown that, with regard to the perception of the risk of infertility, the one's own risk of infertility problems is considered, by respondents, lower than that of peers of the same sex.

Finally, the research stressed that it is necessary to strengthen the scientific awareness regarding the issue of infertility to avoid prejudice and misconceptions and to help all young people, regardless of their

education level, to make the most responsible and correct decisions in this regard.

Limitations

The research has a predominantly exploratory purpose. The statistical population of reference (enrolled at La Sapienza University of Rome in the 2018/2019 academic year) is certainly not representative of the Italian university population, but it is wide enough and differentiated to conduct a pilot study on the topic.

University students are a privileged sample in terms of education. It is probable that with a cohort of young adults without post-secondary education the research would have led to different findings

The sample size guarantees statistical sufficiency, with a good sociological representativeness and respect to the most important sociodemographic variables

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19. For each student it's made up as follows:[surname.studentsnumber@studenti.uniroma1.it]. The same strategy had been previously successfully used in terms of statistical sufficiency (Liuccio, 2019)

20. In addition to the usual matrix cleaning operations (recoding of the response modes, elimination and aggregation of those with very low frequencies), for some multi-response data we were forced to use only the most semantically significant response, generally the one indicated first, since in the importation of the matrix the data was inserted as a string of text in a single field, and therefore not usable according to advanced statistical procedures. The main problems occurred in the indexing of response modes, i.e. the assignment of a numerical code to entries closed during the design phase, and in the treatment of multiple responses according to the usual procedures of descriptive analysis.
21. It should be noted that in the margin of some contingency tables, the Chi-square hypothesis test is used to support the interpretation of results, although, from a strictly technical point of view, the test assumes full meaning only when the sample is extracted from a population with a predetermined distribution and therefore according to the rules of probability.
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