

# Risk factors for voluntary interruption of pregnancy and possible preventive public health actions

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## Keywords

Voluntary interruption of pregnancy • Risk factors • Prevention

## Summary

**Introduction.** Voluntary interruption of pregnancy (VIP) is one of the most frequent healthcare procedures in the world and a Public Health concern in many countries, especially after liberalization of the abortion laws. The study has been carried out to identify the factors that still influence a fraction of female population towards abortion in the absence of fetal malformations.

**Methods.** We conducted a cross-sectional study in the period 2012-2016. The survey was carried out on all VIPs performed at the Gynecology and Obstetrics Unit of the University Hospital "G. Martino" in Messina, Italy.

**Results.** The analyzed sample consisted of 1131 women, aged between 16 and 50 years. Only 4% of VIPs was due to a diagnosis of fetal malformation. In relation to the presence or absence

of fetal malformations as the possible reason for VIP, the sample was split up into two groups and the socio-demographic characteristics were considered. VIPs in the absence of malformations were significantly more frequent in younger women with a lower educational level, in unmarried and unemployed women and in women who already had children. These results were confirmed to Pearson test that indicated that all these variables were related to VIP in the absence of malformations.

**Conclusions.** Based on our results, it is crucial to further prevent requests for VIPs through information and sex education programs for adolescents in schools and consultants, and responsible procreation promotion programs.

## Introduction

Voluntary interruption of pregnancy (VIP) is one of the most frequent healthcare procedures in the world [1-3]. In 2003, approximately 41, 600, 000 VIPs were carried out and this number has remained constant over the past ten years [4]. Abortion seems to be a Public Health concern in many countries, especially after liberalisation of the abortion laws. In Italy over the last twenty years, there has been a constant reduction of VIPs due to more frequent and better use of contraceptive methods and more effective family counselling. Before legalisation, clandestine abortions ranged between 220,000 and 600,000 per year. In Italy, in the years immediately following the introduction of the law 194/78, which established rules for the protection of maternity, there was an increase in the incidence of abortions; however, in subsequent years there was a continual decrease [5]. The provisional data for 2014 showed a total of 97,535 notified by Regions with a decrease of 5.1% respect the definitive data of 2013 (102,760) and a halving compared to 234,801 of 1982, the year in which the highest value was found in Italy [6].

The availability of detailed information concerning VIPs has been made possible by the constant monitoring provided by the above mentioned law, 194/78, which provides national annual presentations to parliament on re-

ports about VIPs, curated by the Ministers of Health and Justice [7]. Data are collected from the VIPs-Epidemiological Surveillance System, which involves, at a central level, the Istituto Superiore di Sanità (National Institute of Health, also named ISS), the Ministry of Health and the National Institute of Statistics (ISTAT) and, at peripheral level, the Regions and the Autonomous Provinces. The Surveillance System is based on the use of a special form, the D12 form of the National Institute of Statistics, which contains various information such as the socio-demographic characteristics of women and other data not obtainable from those derived from the hospital discharge forms. The Regions collect this information monthly from the structures involved in the execution of the VIPs and transmit it to the central level. Since its inception in 1980, the Surveillance System has been able to follow the evolution of VIPs, the prevention of which is one of the primary goals of Public Health. This system has also allowed us to hypothesise the possible reasons women request VIPs and the effectiveness of the prevention programmes [6].

This survey, carried out on all VIPs performed at the Gynecology and Obstetrics Unit of the University Hospital "G. Martino" in Messina, Italy, during the five-year period 2012-2016, has been designed to identify the factors that still influence a fraction of female population towards abortion in the absence of fetal malformations.

This is essential to further reduce this practice, allowing development of more effective and targeted preventive interventions. To this aim, grouping cases according to the presence or absence of diagnosed fetal malformations, the socio-demographic characteristics were assessed to identify potential differences between the two groups.

## Methods

### SAMPLE COLLECTION

We performed a cross-sectional study by analysing the D12 forms of the ISTAT, compiled by the healthcare workers in Gynecology and Obstetrics Unit of the University Hospital “G. Martino” in Messina, for each abortion in the five-year period 2012-2016. The Istat D.12 is individual and anonymous form in which are collected information about the woman and the pregnancy. To avoid bias caused by case selection and to have a more complete overview of the factors influencing VIP choice, no eligibility criteria were established and all D12 forms were examined. These include information on the socio-demographic features of the women (their residence, citizenship, age, marital status, education, occupation and reproductive history), the services involved in certification and the intervention, and the methods of intervention (gestational age, type of intervention, analgesic therapy, duration of hospital stay and complications). The D12 paper forms were subsequently forwarded to the Hospital Presidium Medical Management, which provides information on the specific computer program supplied by the Health Ministry, and by the Italian National Institute of Statistics. Once the data have been entered online, the program automatically generates an internal hospital database from which we extracted, for a single year, the data taken into account through the Query System (Microsoft Office, Access, 2015) by applying specific filters for the data collection and sorting.

### STATISTICAL ANALYSES

In relation to the presence or absence of fetal malformations, the sample was split up into two groups, *i.e.* a control group, consisting of the women who underwent VIP because of fetal malformations and case group formed by those who resorted to abortion for other causes. Statistical processing was carried out using StatSoft software (StatSoft®, version 10). We performed chi square and t-test, for categorical and continuous variables respectively, to assess the differences of the socio-demographic variables in the control and case groups. Pearson correlation test was used to evaluate the relationship between VIPs and the independent variables, *ie.* socio-demographic characteristics. The value of  $P \leq 0.05$  was considered significant.

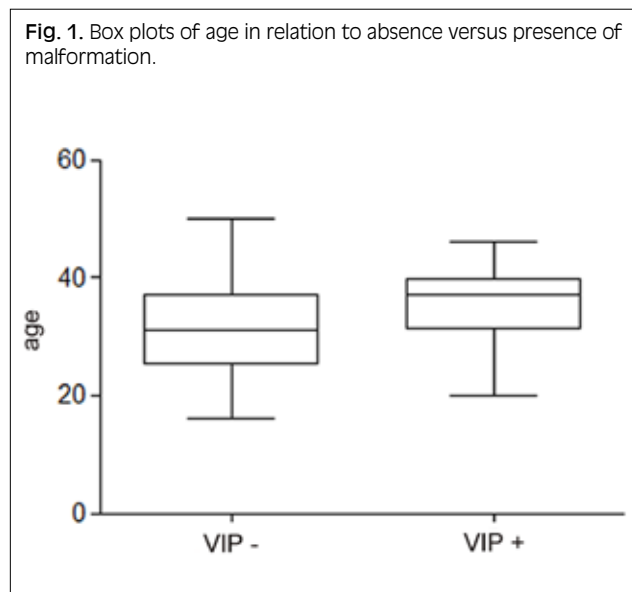
## Results

We collected all VIPs data related to the period 2012-2016, of which only 4% was due to a diagnosis of fetal malformation. The analysed sample consisted of 1131 women, aged between 16 and 50 years ( $31.20 \pm 7.33$ ). Table I reports the socio-demographic characteristics of the all sample split up in control group, consisting of the 45 women, and the more numerous case group formed by 1086 women.

In particular, we considered the following socio-demographic factors: education level, marital status, profession, number of children, number of previous abortions and nationality.

In comparison to control group we observed that features significantly associated with VIP in the absence of malformations were age, education level, marital status, profession and number of previous children. As shown in Figure 1, highly significant differences were related to age since VIPs in the absence of malformations were associated with younger age ( $31.03 \pm 7.33$  vs.  $35.53 \pm 5.74$ ).

Furthermore, in the case group were significantly more frequent the women with a lower educational level, unmarried, unemployed and already with children. Conversely, nationality and previous abortions were not significantly related to VIP choice in the case group (Tab. I). Pearson test confirmed these results highlighting that the variables strongly related to VIP ( $P < 0.0001$ ) were marital status and age. In particular, VIP in the absence of malformations (cases: encoded as 1 vs. controls encoded as 0) was inversely related to the continuous variable age ( $r = 0.118$ ) and to categorical variable marital status for which unmarried, separated/divorced/widow and married were encoded as 1, 2 and 3 respectively ( $r = -0.195$ ). Similarly, the educational level, the employment and having children already were inversely related to VIP in the absence of malformations ( $P < 0.05$ ).



**Tab. I.** Socio-demographic characteristics of the examined women divided into two groups in relation to the presence or absence of fetal malformations as possible cause of VIP.

	VIP without malformation	VIP with malformation	p
<b>Mean age ( ± SD)</b>	31.03 ( ± 7.33)	35.53 ( ± 5.74)	t = -3.79 P = 0.0002
<b>Education level</b>			
Graduation	7.73	22.50	χ <sup>2</sup> = 10.93 P = 0.012
High school	44.22	45.00	
Middle/elementary school	48.04	32.50	
<b>Marital status</b>			
Married	34.94	85.00	χ <sup>2</sup> = 38.83 P = 0.00001
Separated/divorced /widow	4.00	2.50	
Unmarried	61.06	12.50	
<b>Profession</b>			
Employed	33.48	57.50	χ <sup>2</sup> = 8.81 P = 0.003
Housewife	0.55	0.00	
Unemployed	52.32	40.00	
Student	13.65	2.50	
<b>Nationality</b>			
Non EU citizens	5.19	7.50	ns
Eastern Europe	10.28	5.00	
Italy	84.53	87.50	
<b>Number of children</b>			
0	38.13	57.50	χ <sup>2</sup> = 9.14 P = 0.002
≤ 2	49.59	40.00	
> 2	12.28	2.50	
<b>Previous VIP</b>			
None	84.53	90.00	ns
Yes	15.47	10.00	

Lastly, only nationality and previous VIP were not related.

## Discussion and conclusions

The collection of VIP data through the compilation and subsequent consultation of D12 forms has allowed us to obtain useful data for identifying the possible factors that induce women to undergo VIP in the absence of fetal malformations. Despite the large case group, the major limitation of our cross-sectional study was the small number of the reference sample that could reduce the power of the study.

Our survey showed that they had a lower level of education, were unemployed or unmarried, and/or had other children. In particular, the co-existence of these variables significantly increased the use of VIP. From the results obtained, we can extrapolate the influence of socio-economic factors in choosing not to carry on a pregnancy. This hypothesis is confirmed by the multivariate analysis and by the opposite characteristics presented by women who, due to the presence of fetal malformations, chose to undergo VIP.

Contrary to women who used VIP in the absence of malformations, women who chose abortion due to fetal malformations were more often graduated (22.5% vs 7.7%), employed (57.5 vs 33.5%) and married (85% vs 34.94%). Based on this, we can state that a higher level of education, being employed and being married are pro-

tective factors, in the absence of malformations, against the use of VIPs.

No correlation was found with nationality, probably due to the relatively small number of foreign women having a VIP on the total number of VIPs carried out in the examined Gynecology and Obstetrics Unit.

Based on our results, and in the light of the evidence indicating a constant and progressive decrease of VIPs, it is crucial to further prevent requests for VIPs, since such requests must represent in the majority of cases an “*extrema ratio*” and not the choice of election even for the induced psychological consequences [8, 9]. This aim can be obtained by a number of ways, as already indicated in the 2000 Maternal-Child Projective Objective (in Italian POMI) [6]. These ways include information and sex education programmes for adolescents in schools and consultants, and responsible procreation promotion programmes that can be implemented, for example, after a childbirth and during the prevention session of female

**Tab. II.** Multiple regression analysis for education level, marital status (married/unmarried), profession, age and number of sons (Adjusted R<sup>2</sup>= .08391179).

Covariates	B value	P value
Education level	-0.018	0.575
Marital status	-0.237	0.000000
Profession	-0.050	0.113
Number of children	-0.236	0.000000
Age	0.116	0.0014

cancers [10]. Staff working within the services for family care may discuss a woman's request for VIP with her, and together assess the reasons for her choice and explore alternative solutions [11].

According to Articles 2 and 5 of the Italian law 194/1978, counselling may help women to find solutions; information should be given on financial and social support issues, and the right to give birth anonymously. It should be emphasised that family counsellors are far more competent in the provision of maternity support networks, in collaboration with the social services of municipalities and the private social sector. In the interviews, it is also important to prevent the risk of repeated abortion through an analysis of the contraceptive methods used and the failure of the same, in order to convey the correct information and to ensure the effective use of contraception [6, 12, 13]. From all these considerations, the importance of the integration of all the protagonists of these prevention programmes (schools, families, family care services) for the formulation of targeted interventions is evident [7]. These interventions could be addressed especially to the adolescents that, as showed by previous studies, are a high risk category [14, 15].

In conclusion, despite the decreasing of the phenomenon during the last 30 years, the prevention of VIPs remains a primary objective of Public Health that must engage understanding the territorial needs and all critical issues through the constant commitment of the Regions. The latter, continuing to collect data regarding VIPs in all our territory, allow the identification of the target populations on which to focus the intervention strategies in order to improve the situation.

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## Conflict of interest statement

None declared.

## Authors' contributions

GV, AF and RR conceived and designed the experiments; PP, OT, AD and RR performed the data collection; ADP and GV analysed the data; RR and AF wrote the paper.

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## References

- [1] Bentancor A, Hernández AL, Godoy Y, Dapuerto JJ. Report of the procedure of voluntary interruption of pregnancy at a university hospital in Uruguay. *Rev Saude Publica* 2016;50(0).
- [2] Vigoureux S. Epidemiology of induced abortion in France. *J Gynecol Obstet Biol Reprod (Paris)* 2016;45(10):1462-1476.
- [3] Abortion Policies and Reproductive Health around the World. 2014. Available at: <http://www.un.org/en/development/desa/population/publications/pdf/policy/AbortionPoliciesReproductiveHealth.pdf>
- [4] Singh S, Wulf D, Hussain R, Bankole A, Sedgh G. Abortion worldwide: a decade of uneven progress. New York: Guttmacher Institute. Available at: <https://www.guttmacher.org/sites/default/files/pdfs/pubs/AWWfullreport.pdf>; 2009.
- [5] Salvini Bettarini S, Schifini D'Andrea S. Induced abortion in Italy: levels, trends and characteristics. *Fam Plann Perspect* 1996;28:267-71.
- [6] Relazione del Ministro della Salute sulla attuazione della legge contenente norme per la tutela sociale della maternità e per l'interruzione volontaria di gravidanza (legge 194/78). Available at: [http://www.salute.gov.it/imgs/C\\_17\\_pubblicazioni\\_2428\\_allegato.pdf](http://www.salute.gov.it/imgs/C_17_pubblicazioni_2428_allegato.pdf); 2015
- [7] Finicelli C. Phenomenon of induced abortion carried out by adolescents in Europe and Italy between 1980 and 2010. *Minerva Ginecol* 2013;65(5):525-39.
- [8] Righetti PL, Girlanda F, Romagnolo C, Panizzo F, Maggino T. Risvolti psicologici dell'IVG: report d'una ricerca empirica preliminare. *Riv It Ost Gin* 2009;23:101-13.
- [9] Steinberg JR, Rubin LR. Psychological aspects of contraception, unintended pregnancy, and abortion. *Policy Insights Behav Brain Sci* 2014;1(1):239-47.
- [10] Schwarzenberg TL, Buffone MR, Scardia C. Promozione ed educazione alla salute: prevenzione dei comportamenti a rischio in età adolescenziale. *RIMA* 2003;1:1-14.
- [11] Fattorini G. La prevenzione delle IVG ripetute e ruolo dei consultori familiari. *Riv It Ost Gin* 2009;24:117-30.
- [12] Rasch V, Knudsen LB, Gammeltoft T, Christensen JT, Erenbjerg M, Christensen JJ, Sorensen JB. Contraceptive attitudes and contraceptive failure among women requesting induced abortion in Denmark. *Hum Reprod* 2007;22(5):1320-6.
- [13] Dueñas JL, Lete I, Bermejo R, Arbat A, Pérez-Campos E, Martínez-Salmeán J, Serrano I, Doval JL, Coll C. Trends in the use of contraceptive methods and voluntary interruption of pregnancy in the Spanish population during 1997-2007. *Contraception* 2011;83(1):82-7.
- [14] Collier G. The rising proportion of repeat teenage pregnancies in young women presenting for termination of pregnancy from 1991 to 2007. *Contraception* 2009;5:393-6.
- [15] Parazzini F, Ricci E, Cipriani S, Motta T, Chiaffarino F, Malvezzi M, Bulfoni G. Temporal trends in adolescent pregnancies in Lombardy, Italy: 1996-2010. *Eur J Contracept Reprod Health Care* 2013;18(2):88-94.