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## **A Survey on the Perception of Knowledge on Voluntary Termination of Pregnancy and Conscientious Objection Among La Sapienza University of Rome Medical Students**

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### ABSTRACT

#### **A Survey on the Perception of Knowledge on ‘Vtop’ and ‘Co’ Among La Sapienza University of Rome Medical Students**

The study explored the perception and actual knowledge on the topic of VTOP (Voluntary Termination of Pregnancy) and CO (conscientious objection) of the students enrolled in a specific Medical Degree course at the Sapienza University of Rome during the six years of study, using a specific 17-item questionnaire and performing inferential statistical analysis on their answers. The study showed that students have moderate knowledge about VTOP and OC and that the gap between knowledge and perception widens over the years to reach its peak during the sixth and final year of study. Consequently, one aspect that should be studied in depth is the role of syllabus structuring during the six years of the course, focusing attention on the biomedical aspect of the practice of VTOP. Furthermore, it is necessary to gain further general knowledge

on CO among medical students, which as shown by the analysis of the results is also connected to the poor coverage of this topic during medical studies.

**Keywords:** Perception - Knowledge - Medical Students - VTOP

## Introduction

This study reports the results of a specifically drafted survey on a sample of La Sapienza University medical students in Rome, Italy, aimed at exploring the relationship between how informed they felt on the subjects of VTOP and CO. The questionnaire was also designed to analyse how knowledgeable they actually were, consequently exploring their perception of their level of knowledge compared to their actual or real level of knowledge. The study also explored how this relationship changed in regards to their year of study, and therefore acquisition of new knowledge, as well as their sex and personal experience with VTOP.

VTOP and conscientious objection are two very prominent topics both at the Global<sup>1,2,3,4</sup> and European<sup>5,6,7,8</sup> level. According to the WHO website “Between 2015 and 2019, on average, 73.3 million (safe and unsafe) abortions occurred worldwide each year”<sup>9</sup>.

At the European level, Molinelli’s study<sup>10</sup> highlighted the variety of legislative criteria regarding voluntary termination of pregnancy of European countries. According to a report of the European section of the WHO, despite the decline in abortion rates since 1994, the number of abortions in adolescents and young women is still high<sup>11</sup>.

In Italy, VTOP is considered an ethical dilemma. The subject has been relevant in the national public debate since May 22<sup>nd</sup>, 1978, when law No.194, *Rules for the social protection of motherhood and voluntary termination of pregnancy*<sup>12</sup>, was promulgated. The law regulates the roles, procedures and powers regarding VTOP in Italian legislation, while introducing, protecting and legally regulating the right to conscientious objection for health professionals<sup>13</sup>. In Italy, the history and background on this issue has been investigated in a few studies, including the study by Minerva in 2015<sup>14</sup> on conscientious objection in Italy and the study by Bo et al, 2015<sup>15</sup> on conscientious objection and the waiting time for voluntary termination of pregnancy in Italy.

Some of the most relevant data can be found in the 2017 *Report of the Minister of Health on the implementation of the law containing rules for the social protection of maternity and for the voluntary termination of pregnancy (Law 194/78)*<sup>16</sup> which reports, as an aggregate average, a percentage of the 68.4% of conscientious objectors among MDs in Italy, reaching 75-83% in some regions.

However, this study does not focus on clinical practice or on the dynamics and current situations in hospitals, but rather on the step just before this: training of the medical student who will become tomorrow’s doctors. The reason behind this choice is based on the fact that studies focusing on ethicists, legal scholars, policy-makers, physicians, medical receptionists, charge nurses and other health care professionals

make arguments on a context<sup>17</sup> without considering that this context had already been formed for these professionals. Despite the interest and studies regarding the medical profession, there are very few studies that investigate how medical students<sup>18</sup> form their own medical ethic during the years of medical studies. These are the same ethics that will give them the tools to work as health professionals serving the citizens<sup>19</sup>. Interestingly, very little research has been done on the issue in Italy<sup>19</sup>.

One of most relevant studies is Strickland, 2011<sup>20</sup>, which reported how the Royal College of Obstetricians and Gynaecologists recognised the growing problem of doctors refusing to develop the appropriate understanding and expertise on voluntary termination of pregnancy based on conscientious objection, warning of a possible future problem with the minimum guaranteed health benefits. Another relevant study was Nieminen et al, 2015<sup>21</sup>, which studied a sample of medical students and health professionals (physicians and nurses) and reported how approximately half of them (48-50.7%) did not consider valid any personal belief as an adequate justification for conscientious objection. In addition, the same study found how the majority of respondents (57.9-72.8%) reported that conscientious objection would be a cause of conflict in the working community and a disservice to public health.

Therefore, considering the previous studies on the attitude of medical students towards CO<sup>21,22</sup> and investigating the approach to this topic using a questionnaire survey<sup>20</sup>, we decided to study the Italian situation by starting from a course of 1303 medical students at "La Sapienza University of Rome". This study was a first step aimed at investigating the possibility to extend this research to the entire country.

The main question behind this research is: do medical students already have, independently from the medical course they attend, their personal opinions already formed, maintaining them unchanged through their study course or do the acquisition of knowledge and their training lead to the development of medical ethics that influence their choice of becoming a conscientious objector to VTOP or not?

## **Materials and methods**

### **Participants and Procedures**

In the long term, the aim of the study is to investigate the possible influences of university-level medical studies on the development of medical ethics in students.

This questionnaire and the study that followed are intended as a first step in exploring the issue. Therefore, in order to achieve our goal, the study began by working on a local basis with medical students from La Sapienza University of Rome, from freshman to final year students (6<sup>th</sup> year), course "D", for a total of 1303 medical students. The work was carried out in accordance with the Declaration of Helsinki. There was no potential harm to the participants, the anonymity of participants was guaranteed, and informed consent of participants was obtained.

The participants were Medical Students, first year through sixth year, within La Sapienza University of Rome course “D”. Course D is one of the four courses in Italian-language based studies in the Umberto I hospital, in which medical students are divided in alphabetical order and includes students whose surnames start with the letters P to Z. At La Sapienza University, Medicine and Surgery students are divided into 7 courses, five of which are located in “Policlinico” Umberto I hospital (courses A,B,C,D in Italian and course F in English), one in the “Azienda ospedaliera Sant’Andrea Hospital” (course “Sant’Andrea”, in Italian) and one in the “Polo Pontino” hospital hub (course E, in Italian). Students in the four courses in Italian based in Policlinico Umberto I are distributed in the different courses in alphabetical order – the courses are equivalent and provide the students with the same title. Course D specifically was chosen because the course’s president gave her permission for the questionnaire to be distributed to the students and for the results to be published.

The students were contacted through social networks and directly by the student representative of each year. They were provided with the link to complete the questionnaire. The sample was therefore self-selected, due to the fact that the students were free to complete the questionnaire or not.

It was not possible to define any specific including or excluding criteria other than the fact that they were medical students at La Sapienza University of Rome, course “D”.

### **Questionnaire and Data Analysis**

The questionnaire was anonymous and carried out in web mode<sup>23</sup> using Google Modules. It was available to be filled out from the January 23<sup>rd</sup>, 2018, to March 13<sup>th</sup>, 2018. This time frame was chosen because the questionnaire was actively presented to the students of each year in different time spans in order to have a population as homogeneous as possible.

The questionnaire was specifically drafted for this study and consists of 17 items and is divided into three sections.

The first two sections consist of five questions each for a total of ten close-ended questions<sup>24</sup>.

The first section investigates the relation between the perception of knowledge and the actual knowledge of the participants regarding Voluntary Termination of Pregnancy.

The second section investigates the same relationship regarding conscientious objection in VTOP.

In each of the first two sections there is one question built according to the model “how much do you think you are informed”, used to give the participants the opportunity to self-assess their own level of information about the subject. This question investigates self-perception<sup>25</sup> and was developed by creating a 9-point model functional to our study using the Likert scale<sup>26</sup>, where the participants could indicate how informed they felt on the subject on a scale from 1 to 9 (questions 1 and 6).

Four questions follow the first in each section, aimed at investigating the actual level of knowledge of the participants by asking them questions with an increasing level of detail to verify the real level of the knowledge possessed and the difference in respects to the relative perception<sup>27</sup>. Those questions were built taking notice of the current legislation regarding VTOP and conscientious objection in Italy (Law 22 May 1978, N.194. *Rules for the social protection of motherhood and voluntary termination of pregnancy*<sup>12</sup>), and the clinical practice of VTOP and conscientious objection in Italian hospitals (the knowledge of which was provided by professionals in the field who assisted us in the construction of the question) and by asking questions of increasing detail regarding those two fields.

Specifically, the questions about VTOP asked the participants to test their knowledge on the following information: who can perform VTOP (question 2), the legal time limits for the surgical and the pharmacological method (question 3 and 4), the circumstances in which VTOP can be performed (question 5). Regarding conscientious objection the participants were asked to test their knowledge on: which medical professionals can be conscientious objectors (question 7), the professional duties of the conscientious objector (question 8), the percentage of conscientious objectors in Italy (question 9), the existence of alternative work activities for conscientious objectors (question 10).

The third section is made up of 7 questions and collects the socio-demographic data of the population, such as age, sex and year of attendance (questions 11 to 17).

The variables then taken into consideration for the analysis of the results were sex, year of attendance and experience with VTOP. These three variables were chosen because they all seemed able to influence the perception of knowledge and/or the knowledge of the participants on the topics of VTOP and CO. Specifically, sex was chosen because of the hypothesis that women are more interested on the topics of VTOP and CO than men, due to the fact that men cannot become pregnant<sup>28</sup>.

The year of attendance was chosen with the aim to see the effect of the progression through the course's curriculum on the perception of knowledge and understanding of the participants. Consequently, some of the knowledge tested in the questionnaire is taught in specific years of the course's curriculum and therefore more extensive knowledge should be expected from the students who are in more advanced years, also considering that, as stated in the document "Academic Regulations of the Degree Courses Council of the Single Cycle Degree Programme in Medicine And Surgery"<sup>29</sup>, attendance of compulsory teaching activities of the course is necessary for the student to take the exam.

More precisely, according to the information available on the course's official website<sup>30</sup> in the sections "Study plan" and "Attendance", the information regarding the subjects of VTOP and conscientious objection from a gynaecological standpoint is taught in the first semester of year six and the course specifically covers Law 194/78 and VTOP as part of the curriculum<sup>31</sup>.

At the time of the filling of the questionnaire, sixth year students, given the attendance obligation, had for the most part already attended the course and learnt about Law 194/78 and therefore were expected to have more accurate knowledge on the subject than younger students.

The Bioethics module, on the other hand, is taught in year three and, during the year in which the questionnaire was distributed, specifically the themes of VTOP and CO were covered during the lessons from a bioethics standpoint.

This course could have contributed to the interest and perception of knowledge of third year students on these topics.

The experience with VTOP (defined as having direct experience with VTOP on knowing personally someone who has had that experience) was chosen because of the hypothesis that being more experienced with something could influence perception of knowledge and knowledge on that subject<sup>32</sup>. Therefore, two different levels of knowledge and perception of such knowledge are explored: personal knowledge and how it is effected by sex and personal experience, as well as academic knowledge and the student's year of attendance.

Furthermore, due to the fact that the study was investigating perception in relation to knowledge, it was hypothesized that a manifestation of the Dunning-Kruger effect could be seen, an effect, found through a number of studies<sup>33</sup>, that found how often people who feel more knowledgeable about a certain topic are often those who know less about it, due to their inability to accurately self-asses their knowledge.

Regarding statistical analysis a preliminary descriptive analysis was conducted, consisting of the calculation of averages, medians, standard deviations, ranges and percentages of the variables considered at the observation time.

Subsequently, an inferential statistical analysis was carried out using, where appropriate, parametric and non-parameter statistical tests. The dependency between qualitative variables was assessed through Pearson's Chisquare test or, in the case of limited casuistry, Fisher's Exact test. The first type error (alpha) was considered to be 0.05.

Lastly, the most relevant results were shown on tables and graphs.

The software used for statistical analysis is IBM SPSS (Statistical Package for Social Science) Statistics 20.0 (2012).

## **Results**

As previously explained, the participants were asked two sets of questions, one regarding VTOP (5 questions) and one regarding conscientious objection (5 questions), for a total of 10 questions. In each set of questions, the first question explores the perception of the students on how informed they feel on the subject on a scale from 1 to 9 (where 1-3 is poorly informed, 4-6 is moderately informed, 7-9 is very informed). Then, in each set, 4 questions were asked, intended to explore the actual knowledge of the students on the subject. The four questions went from asking very basic informa-

tion to more detailed information, in order to explore the actual degree of knowledge of the participants.

The results were analysed taking in consideration sex, year of attendance and experience with VTOP of the participants. These three variables were selected because they all seemed to have a possible influence on the perception of knowledge and on the actual knowledge of the participants.

From a total of 1303 eligible medical students attending course D, a sample of 219 students completed the questionnaire.

Of those who responded, 145 (66.2%) indicated their gender to be female and 74 (33.8%) as male, with no missing responses.

Regarding year distribution, 58 (26.5%) attended first year, 30 (13.7%) second year, 36 (16.4%) third year, 31 (14.2%) fourth year, 37 (16.9%) fifth year, and 27 (12.3%) were sixth year students.

Participants were asked if they had ever had direct or indirect experience with VTOP, meaning they either experienced it directly or knew personally someone who did. A total of 156 (71.2%) stated they had no experience and 63 (28.8%) stated they had had indirect or direct experience.

### **Questions set 1: VTOP**

In question 1, the students were asked how informed they felt on VTOP. Of all participants, 18.3% said they felt poorly informed, 60.7% said they felt moderately informed and 21% felt very informed. Sixth years though felt significantly more informed than students in other years ( $p < 0.0001$ ), with no students feeling poorly informed (0%), 44.4% feeling moderately informed, and 55.6% feeling very informed. It is important to note that sixth years had recently attended the obstetrics and gynaecology course. Throughout the years, the percentage of students feeling moderately informed decreased, that of those who felt very informed increased, while that of those who felt poorly informed was stable. (Figure 1.1)

Males and females did not give significantly different answers.

Among those who had no experience with VTOP, there were more people feeling moderately informed (64.5%) than among those who had direct or indirect experience (49.2%), while among those who had experience there were more people feeling "very informed" (31.7%), than among those who had no experience (16.7%).

The percentage of students feeling poorly informed was similar (17.9% no experience, 19% direct or indirect experience) ( $p=0,033$ ) (see table 1).

In question 2 the students were asked where VTOP can be performed according to the Italian legislation. More than 70% of students knew that it could be performed by an OB-GYN in a general hospital or by an OB-GYN in a specialised hospital (75.3% for the first and 84.5% for the latter), while 6.4% knew it could be performed in ecclesiastical institutes recognised by the State that provide hospital care. Only 7.3% knew

it could be performed in Evangelical Hospitals and in the Israelite hospital in Rome. The answers did not differ significantly throughout the six years.

More females (82.1%) than males (63.2%), knew that it can be performed by an OB-GYN in a general hospital ( $p = 0.002$ ), while there were no sex differences in the other three options. There were no differences in the answers of students who had or did not have direct or indirect experience with VTOP (see table 1).

In question 3, when asked which the limit of time is within which VTOP using the pharmacological method (such as for example RU486) can be performed in Italy, 21.5% knew that it could be performed within the first 49 days of pregnancy<sup>34</sup>. In all years, the percentage of wrong answers exceeded 60%. A significantly higher percentage of sixth years (44.4%) than students in other years (see table 1) ( $p < 0,0001$ ) gave “90 days” as their answer, which is the time limit to perform VTOP with the surgical method. In the other years, the most popular answers were “40 days” for first, second, third and fifth (35.1%) year, while in the fourth year there was an exact split between the correct answer and “56 days” (Figure 1.2).

There were no differences between the answers of males and females and between those of students who had or did not have direct or indirect experience with VTOP.

In question 4, regarding the time limit within which VTOP can be performed in Italy using the surgical method, 57.1% of students knew it can be performed within 90 days of pregnancy, without significant differences in the percentage of right answers throughout the six years.

More females (62.8%) than males (45.9%) knew that the time limit is 90 days. ( $p=0,021$ ). There were no differences in the answers of students who had or did not have direct or indirect experience with VTOP. (see table 1).

In question 5 the students were asked under which circumstances VTOP is allowed in Italy. A total of 91.8% of students knew it can be performed when “the pregnancy and/or labour represent a serious risk for the woman” and 90.9% knew that termination of pregnancy can be performed when “serious conditions of the foetus, including anomalies and malformations, that can put at serious risk the physical or psychological health of the woman, are assessed”. Respectively 67.6% and 74.9% knew that, according to the law, non-sufficient conditions for VTOP include “the assessment of unsuitable social and health conditions” or “the death of the spouse and the assessment of a family consisting only of a woman in poverty”. There weren't significant differences in the percentage of correct answers throughout the six years.

More males (83.8%) than females (70.3%) knew that, according to the law, “the death of the spouse and the assessment of a family consisting only of a woman in poverty” is not a sufficient condition for VTOP ( $p=0,033$ ), while there were no differences in the other three options.

Regarding their experience, more people with no experience with VTOP, than those with direct or indirect experience, knew that, according to the Italian legislation, “the



	Q1: Informed on VTOP			Q6: Informed on conscientious objection			Q2: In Italy, according to the law, VTOP can be practised by			
	1 to 3	4 to 6	7 to 9	1 to 3	4 to 6	7 to 9	OB-GYN in general hospital*	OB-GYN in specialized hospital*	Ecclesiastical institutes*	Evangelical Hospitals and in the Israelite hospital in Rome*
General										
	18.3%	60.7%	21.0%	28.3%	55.3%	16.4%	75.3%	84.5%	7.3%	6.4%
Year	(p<0.0001)†			(p>0.05)‡			(p>0.05)‡	(p=0.034)†	(p>0.05)‡	(p>0.05)‡
1	22.4%	67.2%	10.3%	37.9%	50.0%	12.1%	74.1%	75.9%	3.4%	3.4%
2	10.0%	80.0%	10.0%	30.0%	63.3%	6.7%	73.3%	83.3%	10.0%	6.7%
3	16.7%	55.6%	27.8%	19.4%	58.3%	22.2%	80.6%	86.1%	5.6%	11.1%
4	16.1%	64.5%	19.4%	22.6%	58.1%	19.4%	80.6%	96.8%	16.1%	12.9%
5	35.1%	48.6%	16.2%	40.5%	45.9%	13.5%	64.9%	94.6%	5.4%	0.0%
6	0.0%	44.4%	55.6%	7.4%	63.0%	29.6%	81.5%	74.1%	7.4%	7.4%
Sex	(p>0.05)‡			(p>0.05)‡			(p=0.002)†	(p>0.05)‡	(p>0.05)‡	(p>0.05)‡
F	14.5%	64.1%	21.4%	30.3%	55.2%	14.5%	82.1%	82.1%	6.2%	4.8%
M	25.7%	54.1%	20.3%	24.3%	55.4%	20.3%	62.2%	89.2%	9.5%	9.5%
Experience	(p=0.033)†			(p>0.05)‡			(p>0.05)‡	(p>0.05)‡	(p>0.05)‡	(p>0.05)‡
Yes	19.0%	49.2%	31.7%	27.0%	52.4%	20.6%	74.6%	81.0%	4.8%	3.2%
No	17.9%	65.4%	16.7%	28.8%	56.4%	14.7%	75.6%	85.9%	8.3%	7.7%
	Q3: Pharmacological VTOP time limit (days)			Q4: Surgical VTOP time limit (days)			Q5: VTOP, within the legal time limit, can be performed			
	Right (49)	Wrong		Right (90)	Wrong		pregnancy and/or labour represent a serious risk for the woman*	assessment of unsuitable social and health conditions	serious conditions of the foetus can put at serious risk the health of the woman*	death of the spouse and family consisting only of a woman in poverty
General										
	21.5%	78.5%		57.1%	42.9%		91.8%	32.4%	90.9%	25.1%
Year	(p>0.05)‡			(p>0.05)‡			(p>0.05)‡	(p>0.05)‡	(p>0.05)‡	(p>0.05)‡
1	20.7%	79.3%		50.0%	50.0%		91.4%	34.5%	93.1%	22.4%
2	23.3%	76.7%		66.7%	33.3%		83.3%	26.7%	80.0%	13.3%
3	19.4%	80.6%		58.3%	41.7%		94.4%	30.6%	86.1%	30.6%
4	35.5%	64.5%		58.1%	41.9%		96.8%	32.3%	96.8%	32.3%
5	10.8%	89.2%		59.5%	40.5%		91.9%	29.7%	94.6%	24.3%
6	22.2%	77.8%		55.6%	44.4%		92.6%	40.7%	92.6%	29.6%
Sex	(p>0.05)‡			(p=0.021)†			(p>0.05)‡	(p>0.05)‡	(p>0.05)‡	(p=0.033)†
F	21.4%	78.6%		62.8%	37.2%		91.0%	36.6%	90.3%	29.7%
M	21.6%	78.4%		45.9%	54.1%		93.2%	24.3%	91.9%	16.2%
Experience	(p>0.05)‡			(p>0.05)‡			(p>0.05)‡	(p=0.004)†	(p>0.05)‡	(p=0.003)†
Yes	22.2%	77.8%		65.1%	34.9%		85.7%	47.6%	92.1%	39.7%
No	21.2%	78.8%		53.8%	46.2%		94.2%	26.3%	90.4%	19.2%
*correct answer; †significant result; ‡non-significant result										

Tab. 1

assessment of unsuitable social and health conditions” (73.7% vs 53.4%  $p = 0.004$ ) or “the death of the spouse and the assessment of a family consisting only of a woman in poverty” (80.8% vs 60.3%  $p=0,003$ ) are not sufficient conditions for VTOP. There were no differences in the answers to the other two options of the same question. (see table 1) In short, despite the fact that the sixth year students felt significantly more informed on VTOP than the students in the other years ( $p<0.0001$ ) they did not give a significantly higher rate of correct answers to the questions. Regarding sex, there were no clear differences between males and females, regarding how informed they felt and how informed they actually were on VTOP, with the exception of women being slightly more informed on the time limit for surgical VTOP. Lastly, despite the fact that people that had direct or indirect experience with VTOP felt more informed, they did not give a significantly higher percentage of correct answers to the questions.

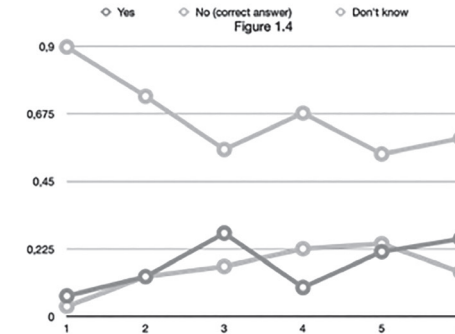
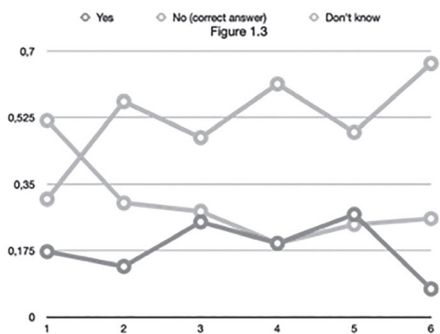
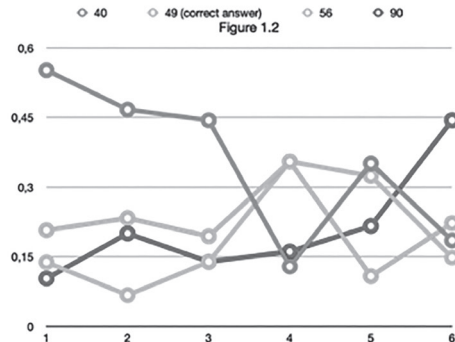
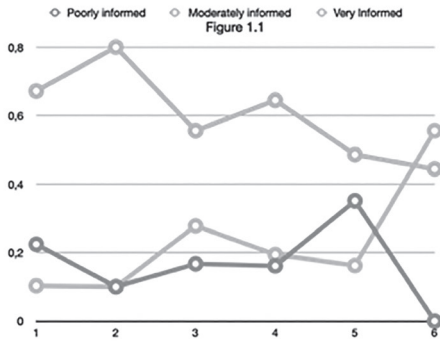


Fig. 1.1 Level of information perceived on VTOP through the six years of the course (question 1)

Fig. 1.2 Answers to question 3 on the time limit for pharmacological VTOP, through the six years of the course (“49 (days)” is the correct answer)

Fig. 1.3. Answers to question 7 on conscientious objection exonerating the gynaecologist from intervention during the entire procedure, through the six years of the course (“No” is the correct answer)

Fig. 1.4. Answers to question 10 on the existence of alternative activities for COs to cover the working hours dedicated to VTOP, through the six years of the course. (“No” is the correct answer)

## Questions set 2: Conscientious objection

In question 6, when asked how informed they felt on conscientious objection 28.3% of the students felt poorly informed, 55.3% felt moderately informed and 16.4% felt very informed. There were no significant differences throughout the six years.

There were no differences between male and females regarding how informed they felt. There were also no differences between students who had direct or indirect experience with VTOP and those who did not. (see table 1)

In question 7, the students were asked if conscientious objection, according to the Italian law, "exonerates the gynaecologist from intervening during the entire procedure, including the assistance prior to and after the procedure". The students could answer "Yes", "No" and "I don't know". Results showed that 48.9% of the students knew the correct answer to this question was "No", while 32.4% said they did not know the answer. Sixth year students gave a higher percentage of correct answers (66.7%) than the other years, while the lowest percentage of right answers was among the first-year students (31%). More than half of first years (51.7%) said they did not know the answer. The percentage of correct answers increased throughout the sixth-year students, and the percentage of students who said they did not know the answer decreased, while the percentage of wrong answers was stable. ( $p=0.02$ ) (Fig. 1.3)

There were no differences in the answers between male and females.

There were also no differences between students who had direct or indirect experience with VTOP and those who did not. (see table 2)

In question 8, when asked what the average percentage of conscientious objectors in Italy is (according to the 2016 data of the Ministry of Health), 38.4% of the students knew it was between 65-75%, 28.3% thought it was lower and 33.3% thought it was higher, without significant differences throughout the six years.

There were no differences in the answers between male and females.

There were also no differences between students who had direct or indirect experience with VTOP and those who did not (see table 2).

In question 9, the students were asked if "other health care professionals (e.g. anaesthesiologists) can be, according to the law, conscientious objectors". Regarding this question, 61.6% knew that the answer was "Yes", 29.2% said they did not know and 9.1% gave the wrong answer. There were no differences throughout the six years.

There were no differences in the answers between male and females.

There were also no differences between students who had direct or indirect experience with VTOP and those who did not (see table 2).

In question 10, when asked if "alternative activities are planned for conscientious objectors to cover the working hours dedicated to VTOP", 14.6% knew that the correct answer was "No", 68.9% said they did not know and 16.4% gave the wrong answer. A significantly higher percentage of first-year students (89.7%) than students in other years said they did not know the answer. The percentage of students stating they did

not know the answer became lower throughout the years (second year 73.3%, third year 55.6%, fourth year 67.7%, fifth year 54.1%, and sixth 59.3%), however the percentage of right and wrong answers increased. ( $p=0.007$ ) (Fig. 1.4)

There were no differences in the answers between male and females.

There were also no differences between students who had direct or indirect experience with VTOP and those who did not (see table 2).

	Q7: CO exonerates gynaecologist from intervening during the entire procedure			Q8: Percentage of COs in Italy		Q9: Can other health care professionals be COs			Q10: Alternative activities are planned for COs		
	Yes	No*	Don't know	65-75%*	Other	Yes*	No	Don't know	Yes	No*	Don't know
General											
	18.7%	48.9%	32.4%	38.4%	61.6%	61.6%	9.1%	29.2%	16.4%	14.6%	68.9%
Year	( $p=0.020$ ) †			( $p>0.05$ ) ‡		( $p>0.05$ ) ‡			( $p=0.007$ ) †		
1	17.2%	31.0%	51.7%	34.5%	65.5%	53.4%	8.6%	37.9%	6.9%	3.4%	89.7%
2	13.3%	56.7%	30.0%	43.3%	56.7%	63.3%	10.0%	26.7%	13.3%	13.3%	73.3%
3	25.0%	47.2%	27.8%	33.3%	66.7%	69.4%	2.8%	27.8%	27.8%	16.7%	55.6%
4	19.4%	61.3%	19.4%	29.0%	71.0%	61.3%	3.2%	35.5%	9.7%	22.6%	67.7%
5	27.0%	48.6%	24.3%	51.4%	48.6%	70.3%	10.8%	18.9%	21.6%	24.3%	54.1%
6	7.4%	66.7%	25.9%	40.7%	59.3%	55.6%	22.2%	22.2%	25.9%	14.8%	59.3%
Sex	( $p>0.05$ ) ‡			( $p>0.05$ ) ‡		( $p>0.05$ ) ‡			( $p>0.05$ ) ‡		
F	18.6%	47.6%	33.8%	36.6%	63.4%	64.1%	6.9%	29.0%	16.6%	14.5%	69.0%
M	18.9%	51.4%	29.7%	41.9%	58.1%	56.8%	13.5%	29.7%	16.2%	14.9%	68.9%
Experience	( $p>0.05$ ) ‡			( $p>0.05$ ) ‡		( $p>0.05$ ) ‡			( $p>0.05$ ) ‡		
Yes	22.2%	47.6%	30.2%	36.6%	63.4%	60.3%	14.3%	25.4%	17.5%	15.9%	66.7%
No	17.3%	49.4%	33.3%	40.6%	59.4%	62.2%	7.1%	30.8%	16.0%	14.1%	69.9%

\*correct answer; †significant result; ‡non-significant result

Tab. 2

## Discussion

Before discussing the results found in this study, it is important to underline the importance of carrying out studies on medical students and their perspectives on the medical school curriculum<sup>35,36,37,38</sup> in order to assess the effectiveness of the pedagogical strategies adopted by the teaching institutions and ensure high-quality professional training<sup>39</sup>. It is even more important to do so on particularly socially relevant topics such as VTOP and CO<sup>40,41,42,43</sup> specifically – in this case – due to the hypothesis that the knowledge of the students on these topics could possibly guide their judgement and future professional choices.

When asked about how informed they felt on VTOP most of the students felt moderately informed (60.7%), while there was an equal percentage of students feeling poorly or very informed (respectively 18.3% and 21%).

When asked the specific questions on the normative aspects of VTOP, they showed moderately good knowledge on the topic, as seen in the results, so that their actual level of knowledge can be considered consistent with the students' self-assessment.

Observing how the students' perception and knowledge change during the years of attendance, we can observe that the third-year students, as expected, felt mildly more informed than other students (27.8% very informed vs 21.0% of all students  $p < 0.0001$ , see table 1), likely due to the fact they had recently attended one of the courses that cover topics explored in the questionnaire from a bioethics standpoint (attendance to the courses is compulsory and necessary to take exams as reported in methods), but did not give significantly different answers than those of all the students.

Sixth-year students also felt significantly more informed than students from previous years (55.6% very informed vs 21.0% of all students  $p < 0.0001$  see table 1), likely as a result of the fact that they had recently attended a course that covered Law 194/78 as part of the course curriculum.

However, although they felt more informed, they did not show higher knowledge than other students. In fact, they not only had the same knowledge level as younger students, but 44.4% of them confused the time limit for pharmacological VTOP (49 days<sup>44</sup>) with that of the surgical method (90 days). While students from previous years, even though they got the answer wrong as well, with nearly the same percentage, they did not confuse the two different time limits. Therefore, it can be concluded that the fact that sixth-year students study Law 194/78, and therefore have more experience with it, does not necessarily increase their knowledge on the subject. However, data suggests that it increases their confidence in their knowledge on the topic.

Moving on to CO, the students felt less informed on the subject than on VTOP (with 28.3% of the students feeling poorly informed, 55.3% feeling moderately informed and 16.4% feeling very informed). There was no difference in how informed the students felt throughout the six years and this may be due to the fact that CO is not adequately covered in the medical curricula<sup>45</sup>.

The answers the students gave to the questions regarding the normative aspects of CO confirmed a generally poor knowledge of the topic among the students of all years, as the results show.

In the study, another issue explored was the influence of sex on the student's knowledge on VTOP and CO. This was done in order to explore the very common assumption that women are more interested in these issues than men, seeing that only women can become pregnant.

In reality, we found that there was no difference between males and females on how informed they felt on VTOP and CO. Regarding their actual knowledge, it was found that males and females gave similar answers in nearly all the questions.

Lastly, the influence of having experience with VTOP on how informed the students felt and their actual knowledge on VTOP and CO was explored. Experience was de-

defined as “having direct experience with VTOP or knowing personally someone who has that experience”. The first data to highlight is that on 219 students that filled the questionnaire 63 of them (28.8%) had said experience.

Results showed that people who had direct or indirect experience with VTOP felt more informed on VTOP than people who did not (31.7% vs 16.7% felt very informed  $p=0.033$  see table 1), while there was no difference on how informed they felt on CO. Regarding the actual knowledge though there were no differences in the answers of those who had experience and those who did not.

The only exception was question 5, on the circumstances in which VTOP can be performed, in which people with experience with VTOP chose the two wrong options with a significantly higher percentage than those who did not have experience (see results and table 1).

These results suggest a mild manifestation of the Dunning-Kruger effect.

According to this effect, found through a number of studies<sup>33</sup>, those who believe they know more on a certain subject, tend to be those who actually know less about it. This effect can be seen in people with experience with VTOP, who, likely due to their experience, felt more informed, despite the fact that they gave a higher percentage of wrong answers in question 5. However, we can also see this in sixth-year students, likely due to their studies<sup>46</sup>, who felt more informed than others on VTOP. The reality was that they were only more confused on the time limit for surgical VTOP, and they also gave a lower percentage of correct answers in question 2 than other students.

In short, the main finding of this study was that, through the years of their medical studies, the students increased their confidence on their knowledge regarding the subjects of VTOP and conscientious objection, especially in the sixth year, but this increased confidence was not accompanied by an equal increase in their knowledge. This finding does not match with the fact that, according to the course curriculum, they were taught about the information asked in the survey in the third and sixth year and therefore an increase of their knowledge would have been expected. Overall, the students' knowledge on the subject of VTOP can be considered moderate and matches the perception of their knowledge that the students have, especially in the first years, while the gap between knowledge and perception widens throughout the years to reach its peak in the sixth year. Knowledge on conscientious objection, on the other hand, seems to be generally poor, and the students seem to be partially aware of it, without relevant differences throughout the six years. The influence of sex and experience with VTOP, concerning knowledge and perception of this knowledge on the subjects explored, can be considered minor.

### **Limitations**

The study was carried out on a sample of a small population of medical students, all from the same course. Furthermore, the comparisons between the different years was

made considering different groups of students attending each year and not following the same group of students during the six years. The sample was self-selected, due to the fact that the questionnaire was internet-based.

## **Conclusion**

This cross-sectional study aims at investigating, through an original survey questionnaire, the perception of knowledge and actual knowledge on the subjects of VTOP and conscientious objection in a population made up of medical students.

The study leaves some questions open for further research. In fact, the reason why the students' knowledge on the bioethical and normative aspect of VTOP does not increase throughout the years, despite being taught this information, is unclear. One aspect that is likely involved and should be investigated is the role of the curriculum and its increasing focus, throughout the six years of the course, on the biomedical aspect of Medicine and less on the bioethical and normative aspect. In the "Gynaecology and Obstetrics" course syllabus, only a single 1-hour lesson in the entire course was dedicated to VTOP<sup>31</sup>. Furthermore, attention should be paid to the fact that throughout the years the students increase their confidence in their knowledge, leaving a gap between knowledge and perception that may cause future errors in judgement.

Another aspect that should be investigated further is the lack of general knowledge regarding CO among medical students, which could be linked to the scarce coverage of this topic in the course curriculum. There is no explicit coverage of this topic in particular in the "Gynaecology and Obstetrics" course syllabus<sup>31</sup>.

Since non-academic variables, such as sex and personal experience, have been shown to have a minor impact on the students' knowledge on the topics investigated, special attention should be paid to the importance of Medical Education in the acquisition of knowledge regarding these topics.

Considering that knowledge is key for future physicians for making the best decisions regarding choices for their practice and their patients, measures should be taken to further investigate and increase the knowledge of medical students on the topics of VTOP and CO.

## **Bibliography and notes**

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1. Coppola F, Briozzo L, Nozar F, Fiol V, Greif D, Conscientious objection as a barrier for implementing voluntary termination of pregnancy in Uruguay: Gynecologists' attitudes and behavior. *Int J Gynaecol Obstet Off organ Int Fed Gynaecol Obstet.* 2016;134(S1):S16-9.

2. Bongongo T, Govender I, Knowledge, attitudes and practices of contraceptive methods among women seeking voluntary termination of pregnancy at Jubilee Hospital, Pretoria, South Africa. *African J Prim Heal care Fam Med*. 2019;11(1):e1-5.
3. Marván ML, Orihuela-Cortés F, Río AA Del, [Young Mexicans' attitudes towards voluntary interruption of pregnancy and opinions on unsafe abortion as a public health problem]. *Cad Saude Publica* [Internet] 2018;34(10):e00192717. Available from: <https://doi.org/10.1590/0102-311X00192717>.
4. Campo-Arias A, Herazo E, Voluntary Interruption of Pregnancy in Colombia: Contributions to the Debate from Public Mental Health. *Revista colombiana de psiquiatria* 2018;47:201-3.
5. Leroy H, Médecine générale de ville et IVG médicamenteuse en région Grand Est. *Sci du Vivant* [q-bio] [Internet]. 2017; Available from: hal-01932300.
6. Lertxundi R, Ibarrondo O, Merki-Feld GS, Rey-Novoa M, Rowlands S, Mar J, Proposal to inform European institutions regarding the regulation of conscientious objection to abortion. *Eur J Contracept Reprod Heal care Off J Eur Soc Contracept* 2016;21(3):198-200.
7. Moure Soengas A, Cernadas Ramos A, Percepción del alumnado de medicina sobre la objeción de conciencia a la interrupción voluntaria del embarazo en Galicia. *Gac Sanit* [Internet] 2020;34(2):150-6. Available from: <http://www.sciencedirect.com/science/article/pii/S0213911119300792>.
8. Reinholz D, Casati S, Beretta O, Merlani G, Termination of pregnancy in a border region between Switzerland and Italy (2008-2015). *Swiss Med Wkly* 2018;148:w14636.
9. WHO. Preventing Unsafe Abortion [Internet]. [cited 2020 Nov 10]. Available from: <https://www.who.int/news-room/fact-sheets/detail/preventing-unsafe-abortion>.
10. Molinelli A, Picchioni DM, Celesti R, Voluntary interruption of pregnancy in Europe: medico-legal issues and ethical approach to the regulation. *Minerva Ginecol*. 2005;57(2):217-23.
11. Lazdane G, Abortion In Europe: Ten Years After Cairo. *Entre Nous, The European Magazine for Sexual and Reproductive Health* N59 [Internet] 2005;4-6. Available from: [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/69763/en59.pdf](https://www.euro.who.int/__data/assets/pdf_file/0004/69763/en59.pdf).
12. Legge 22 maggio 1978, n. 194 - Norme per la tutela sociale della maternità e sull'interruzione volontaria della gravidanza [Internet]. Available from: <http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:1978-05-22;194>.
13. Article 9.
14. Minerva F, Conscientious objection in Italy: Table 1. *J Med Ethics* [Internet] 2015;41(2):170-3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24861043>.
15. Bo M, Zotti CM, Charrier L, The no correlation argument: can the morality of conscientious objection be empirically supported? the Italian case. *BMC Med Ethics* [Internet]. 2017;18(1):64. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29157253>.
16. Ministero della Salute. Relazione Ministro Salute attuazione Legge 194/78 tutela sociale maternità e interruzione volontaria di gravidanza - dati definitivi 2017 [Internet] 2018. Available from: <http://www.salute.gov.it/portale/donna/dettaglioPublicazioniDonna.jsp?lingua=italiano&id=2807>.
17. Harris LF, Halpern J, Prata N, Chavkin W, Gerdts C, Conscientious objection to abortion provision: Why context matters. *Glob Public Health* [Internet] 2016;1-11. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27618556>.
18. Strickland SL, Conscientious objection in medical students: a questionnaire survey. *J Med Ethics*. 2012;38(1):22-5.



19. Query using PubMed: (student OR medical student) AND (survey study OR questionnaire study) AND (abortion OR voluntary termination of pregnancy), found 141 entries, only 56 about the proper topic, at the time of our research.
20. Query using PubMed: "Italian student" AND (survey study OR questionnaire study) AND (abortion OR voluntary termination of pregnancy), found 1 entry; "Italian medical student" AND (survey study OR questionnaire study) AND (abortion OR voluntary termination of pregnancy), found 1 entry, at the time of our research.
21. Nieminen P, Lappalainen S, Ristimäki P, Myllykangas M, Mustonen A-M, Opinions on conscientious objection to induced abortion among Finnish medical and nursing students and professionals. *BMC Med Ethics* [Internet]. 2015;16(1):17. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25885698>.
22. Nordstrand SJ, Nordstrand MA, Nortvedt P, Magelssen M, Medical students' attitudes towards conscientious objection: a survey. *J Med Ethics* [Internet]. 2014;40(9):609–12. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23946469>
23. Ebert JF, Huibers L, Christensen B, Christensen MB, Paper- or Web-Based Questionnaire Invitations as a Method for Data Collection: Cross-Sectional Comparative Study of Differences in Response Rate, Completeness of Data, and Financial Cost. *J Med Internet Res*. 2018;20(1):e24.
24. Jenn NC, Designing A Questionnaire. *Malaysian Fam physician off J Acad Fam Physicians Malaysia* 2006;1(1):32-5.
25. Park CW, Gardner MP, Thukral VK, Self-perceived knowledge: Some effects on information processing for a choice task. *The American Journal of Psychology* 1988;101:401-24.
26. Sullivan GM, Artino ARJ, Analyzing and interpreting data from likert-type scales. *J Grad Med Educ*. 2013;5(4):541-2.
27. Almutairi AF, Alkhtheri BA, Aleidan HN, Alhabib AA, Alotaibi EA, Salam M, Examining the perceived versus the actual knowledge about forensic odontology: A cross-sectional survey among dentists. *Clin Exp Dent Res*. 2018;4(6):297-304.
28. Regitz-Zagrosek V, Sex and gender differences in health. *Science & Society Series on Sex and Science*. *EMBO Rep*. 2012;13(7):596–603.
29. Academic Regulations of The Degree Courses Council of the Single Cycle Degree Programme in Medicine and Surgery [Internet]. Available from: <https://web.uniroma1.it/farmaciamedicina/en/farmaciamedicina/didactic-activities/regulations/academic-regulations-degree-courses-council-single>.
30. Sapienza Università di Roma, Catalogo dei Corsi di studio 2019/2020 Medicine and Surgery [Internet]. [cited 2019 Nov 1]. Available from: <https://corsidilaurea.uniroma1.it/en/corso/2019/30008/home>.
31. Sapienza Università di Roma, Catalogo dei Corsi di studio 2019/2020 Medicine and Surgery Attendance 1027369 - Ginecologia e Ostetricia - Ginecologia [Internet]. [cited 2019 Nov 1]. Available from: <https://corsidilaurea.uniroma1.it/en/view-course-details/2019/30008/20191021114052/905d3dfd-715f-4441-920a-5feadf8a6cd5/d22e9b28-3a8d-4d6c-8f21-574d9faff3e0/f6d57747-b2cc-47c8-85ee-5f0bfd4a3eb8/ba9e2f44-5b06-4251-bf20-0410fbceb721>.
32. Hauer K, Wilkerson L, Teherani A, The Relationship Between Medical Students' Knowledge, Confidence, Experience, and Skills Related to Colorectal Cancer Screening. *J Cancer Educ*. 2008;23:209-13.
33. Kruger J, Dunning D, Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *J Pers Soc Psychol*. 1999;77(6):1121-34.

34. From the time the questionnaire was administered, this limit has been now extended to 63 days with the New Law n. 865 of 12 August 2020 of the AIFA, Italian Pharmaceutical Agency [Determina n.865 del 12 agosto 2020 dell'AIFA]
35. Majumdar A, Ganeshkumar S, Roy G, Knowledge, Attitude and Perception of Medical Students Regarding Community-oriented Research -. *Natl J community Med.* 2015;6:230-5.
36. Sherer R, Dong H, Yu F, Fan J, Li J, Jiang I, et al. A survey of graduates' perceptions on a Chinese medical school's traditional and reform curricula. *Perspect Med Educ [Internet]* 2016;5(4):244-52. Available from: <https://doi.org/10.1007/s40037-016-0282-4>.
37. Sbayeh A, Qaedi Choo MA, Quane KA, Finucane P, McGrath D, O'Flynn S, et al. Relevance of anatomy to medical education and clinical practice: perspectives of medical students, clinicians, and educators. *Perspect Med Educ [Internet]* 2016;5(6):338-46. Available from: <https://doi.org/10.1007/s40037-016-0310-4>.
38. Ricci M, St-Onge C, Xiao J, Young M, Students as stakeholders in assessment: how students perceive the value of an assessment. *Perspect Med Educ.* 2018;7(6):352-61.
39. Fernandes AK, Borges N, Rodabaugh H, Measuring cognitive outcomes in a pre-clinical bioethics course. *Perspect Med Educ.* 2012;1(2):92-7.
40. Bennett CL, McDonald DA, Finch A, Rennie S, Morse JE, North Carolina Medical Student Views on Abortion. *N C Med J [Internet]* 2018;79(1):14 LP-19. Available from: <http://www.ncmedicaljournal.com/content/79/1/14.abstract>.
41. Espey E, Ogburn T, Leeman L, Nguyen T, Gill G, Abortion education in the medical curriculum: a survey of student attitudes. *Contraception* 2008;77(3):205-8.
42. Jaime MC, Yakzan A, Lewis C, Schwarz EB, Abortion and student health services expanding the conversation with student perspectives. *Contraception* 2018;98(4):301-5.
43. Smith BEY, Bartz D, Goldberg AB, Janiak E, "Without any indication": stigma and a hidden curriculum within medical students' discussion of elective abortion. *Soc Sci Med.* 2018;214:26-34.
44. From the time the questionnaire was administered, this limit has been now extended to 63 days with the New Law n. 865 of 12 August 2020 of the AIFA, Italian Pharmaceutical Agency [Determina n.865 del 12 agosto 2020 dell'AIFA]
45. Provenzano-Castro B, Oizerovich S, Stray-Pedersen B, Future healthcare professionals' knowledge about the Argentinean abortion law. *Int J Med Educ.* 2016;7:95-101.
46. Motta M, Callaghan T, Sylvester S, Knowing less but presuming more: Dunning-Kruger effects and the endorsement of anti-vaccine policy attitudes. *Soc Sci Med.* 2018;211.

### **Declaration of Interest**

The authors declare no conflicts of interest.