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How much do health professionals know about the health of TGD people? An Italian cross-sectional study

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Abstract

Transgender and Gender Diverse (TGD) people is an umbrella term used to describe members of multiple societies with gender identities or expressions differing by gender socially attributed to the sex assigned at birth. TGD people have specific healthcare needs and struggles with access barriers that should be addressed by health systems. TGD people are constantly in contact with health professionals. But is evident that health professionals in general have little training in the care and health of TGD people. The aim of this study is to examine among Italian healthcare professionals the approach, knowledge, and perceptions they have towards caring for TGD people. This study conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines for reporting observational studies specifically for cross-sectional studies. The online web-based survey used in this study was con-ducted using Google Modules. A total of 605 health professionals were interviewed. At the national level, in all 5 geographical areas analyzed, there was a lack of knowledge about TGD health among health professionals. The

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results of this research show that the Italian health professionals are aware of their own lack of knowledge about the healthcare needs of TGD people. Integrating holistic approaches to their care in medical school curricula supports the development of health systems that can address the needs of these people, also by the improvement of health professionals' skills and specific education.

Keywords: cross-sectional study, transgender and gender diverse people, health professional education, survey, Italy, healthcare system.

1. Introduction

Nowadays, societies in general and healthcare, specifically, face a number of challenges (Costa 2023a). One of the most important and complex one concerns the health of transgender and gender diverse (TGD) people. TGD people is an umbrella term used to describe members of multiple societies with gender identities or expressions differing by gender socially attributed to the sex assigned at birth (Coleman *et al*. 2022).

From an epidemiological point of view, it is not easy to have certain data on the TGD population. It is estimated that there are around less than 1% of the worldwide population TGD, with figures ranging from <0.1% to 0.6%[1] while in Italy around 400.000[2].

TGD people have specific healthcare needs and struggles with access barriers that should be addressed by health systems. This is because TGD people live stigmatizing practices over all parts of their lives, including the experience in health services (Costa 2022; Costa 2023b, c). First of all, a good part of TGD people undergo hormone therapy involving several problems in its management in order to derive all positive effects and to reduce the side effects (Henry *et al*. 2019). TGD people resort to masculinization or feminization surgery of the

[1] https://www.economist.com/the-economist-explains/2017/09/01/why-transgender-people-are-being-sterilised-in-some-european-countries
[2] *Ibidem*

body, especially at the level of the breast and reproductive organs, and these are techniques that can involve various complications. Thus, TGD people undergoing cross surgery with hormone intake should screen for cancers affecting organs of the sex assigned at birth (Costa 2023b). TGD people starting hormone therapy tend to claim they have a greater sense of belonging to the gender identity with which they identify (Wylie *et al*. 2016). The aim of hormonal treatment is to promote the development of the secondary sexual characteristics of the sex to which a TGD identifies, while progressively reducing the secondary sexual characteristics (Henry *et al*. 2019). Specifically, the feminization process is favored through the intake of estrogen, and, on the other hand, the masculinization process by taking testosterone (Wierckx *et al*. 2012). Moreover, regarding hormonal treatment, there are problems related to the illegal, and often without prescription, intake of sex hormones (Unger *et al*. 2016). Some TGD people take non-pre- scribed sex hormones obtained through friends, black market sources, or foreign drug dealers. Thus, the potential risks for many TGD people consist in willing to use nonprescribed hormones to achieve the physical and psychological changes they desire. For example, Leavitt *et al*. (1980) reported that TGD who used medically unsupervised hormones displayed better psychological adjustment than TGD people who were not receiving hormone treatment. Moreover, "TGD people use many techniques to express their gender identity that may include changes to deportment, body, facial-and head-hair styles, clothing, cosmetics, jewelers, fashion accessories, body fat, and muscularity. TGD people may also strategically employ voice and speech modifications, padding, concealment devices, sex toys, genital or breast prostheses, genital enhancement or diminishment devices, tattooing, or piercings" (Costa 2023b, 97). More permanent changes may be caused by hormone therapy, gender confirmation, surgery, and ancillary masculinizing or feminizing procedures–any of which can occur in various combinations (DeLamer and Plante 2015). In particular, the types of surgery most used by TGD people are summarized in Tables 1 and 2.

Type of surgery	*Short definition*
Mastectomy	Breast reduction or breast removal
Hysterectomy and salpingo-oophorectomy	Removal of the internal reproductive organs
Vulvectomy	Removal of the vulva
Vaginectomy	Removal of the vagina
Metoidioplasty	Transformation of the enlarged clitoris into a small penis
Phalloplasty	Construction of a penis
Urethroplasty	Rerouting of the urethra
Scrotoplasty and testicular implants	Construction of scrotum and testicles
Erectile implant	Implantation of an erection prosthesis
Liposuction	Suction technique to remove fat from specific areas of the body (most commonly of hips and thighs)
Voice-masculinizing surgery	Reduction/retrusion thyroplasty
Facial masculinizing surgery	To make the face more masculine
Chest implant	Prosthetic implants to make the chest more similar to the male one
Calf implant	To make the legs more muscular

Table 1 - Surgical intervention for transmasculine spectrum

Along with these types of interventions, the transition process also requires the intake of hormones to support and maintain body change (Costa 2023c). Briefly, it is important to remember that any surgical procedure will result in scarring which will affect tissue sensitivity, including sexual sensitivity.

Type of surgery	*Short definition*
Mammoplasty	Breast augmentation
Castration	Removal of the testicles
Penectomy	Removal of the penis
Vulvoplasty	Construction of the vulva
Clitoroplasty	Construction of the clitoris
Vaginoplasty	Construction of the vagina
Urethroplasty	Rerouting of the urethra
Voice-feminizing surgery	Otolaryngological changes
Facial feminization surgery and lipofilling	Brow, chin, or Adam's apple recontouring
Implants and lipofilling	Scalp hair implants, hip buttocks augmentation

Table 2 - Surgical interventions for the transfeminine spectrum

Post-surgical complications can further reduce tissue sensitivity. However, one of the goals of genital surgery is to allow gender-congruent use of genitalia, including sexual use. Successful metoidioplasties generally result in increased sexual satisfaction. Phallo-plasty techniques vary, as do the resultant sexual sensitivity levels. Successful genital reconstruction for transfeminine spectrum people results in orgasmic capacity in the majority of cases (DeLamer and Plante 2015).

However, the fact of modifying one's body involves several social and health problems. Nevertheless, very few TGD people can live their lives without having to refer to their sex assigned to the bird. This occurs mainly on the sexual level. Therefore, while the physical changes undertaken by TGD people are usually most deeply motivated by their gender identity needs, in many instances the expression of their own sexuality, and that of their partners will also be impacted by the bodily alterations they undertake to bring their gender identity and bodies into better alignment (DeLamer and Plante 2015).

Another health concern of TGD people regards the problems of liquid silicone in-jection. Many TGD people resort to injection of liquid silicone with the aim of making one's body more compatible with the perceived gender identity

(Henry *et al*. 2019; DeLamer and Plante 2015). The most frequent anatomical areas are the hips and buttocks, followed by the face, breasts, and legs.

According to recent estimates, the total volume of silicone injected is around 8 liters, administered in several sessions (Manzoor *et al*. 2022), in average, TGD people had received injections about twice a year (Henry *et al*. 2019). Silicone wings often mix with or are replaced with other fluids such as mineral oil or olive oil (Manzoor *et al*. 2022). Silicone injections should be carried out by specialized medical personnel that have also a cost that is not accessible to everyone. *Therefore*, very frequently, TGD people refer to unqualified personnel, who perform the same service at much lower costs (Henry *et al*. 2019). The existence of a real black market was thus revealed (McGowan *et al*. 1999) for silicone injections. It should also be remembered that most TGD people have a high incidence and prevalence of cases of HIV seropositivity, seroconversion, and other sexually transmitted diseases (Manzoor *et al*. 2022).

HIV seropositivity is particularly high among TGD people who engage in sex work, people of color, specifically, African Americans (Coleman *et al*. 2022). One of the most serious first consequences of HIV is the multimorbidity, or the concomitance of multiple chronic diseases. In practical terms, multimorbidity represents the accumulation of serious health conditions that have the potential to negatively affect one's functional ability or cognitive status (DeLamer and Plante 2015).

TGD people also present many problems of psychological nature, and four diagnoses in the DSM-V are applicable to TGD people; all of these diagnoses require the presence of clinically significant distress or disability, which implies that TGD identity or behavior per se is not sufficient for the diagnosis of a mental disorder under the DSM-V (Wierckx *et al*. 2012). Gender Identity Disorder Not Otherwise Specified, the broadest of the four DSM V diagnoses, could be applicable to other TGD people who experience sufficient distress or disability to meet diagnostic *criteria* (Wierckx *et al*. 2012). Moreover, among TGD people, a high number of cases appear to be at risk of suicide, suicide attempts, and other forms of self-harm. In particular, self-mutilation of the genitals and

breasts is very frequent, especially in population groups with a low socio-economic status and due to the long waiting times for surgery (DeLamer and Plante 2015). In this regard, given these difficult realities, the specialized health concerns of TGD people are likely to continue to challenge clinicians and researchers for the foreseeable future. Thus, it is evident that TGD people have high health needs.

Nevertheless, the TGD population suffers from stigmatization, discrimination, non-acceptance by the family, gender-based violence, and social exclusion (Garcia Ferreira *et al*. 2019). All this is also reflected at the level of health care, in fact TGD people face many barriers to access health care such as lack of knowledge from health professionals on gender issues, dis-crimination by the health worker, toilets not suitable for TGD people etc. (DeLamer and Plante 2015).

From all this, it is clear that the TGD people are constantly in contact with health professionals. But is evident that health professionals in general have little training in the care and health of TGD people (Padilha *et al*. 2022; Braun *et al*. 2017). In particular, health professionals such as physicians and nurses would appear not to receive specific training in the field of assistance to TGD people in their university education (Obasi *et al*. 2023). There was also a significant shortage in terms of care training aimed at transmitting the culture of TGD experience. It is also possible to note the scarcity of papers dealing with this dimension. Eliason *et al*. (2010), for example, recorded it as the top ten nursing journals, between they published eight articles, and not only focused on TGD people, but more generic on LGBT issues, with a percentage of 0.16% in all 10 magazines. Furthermore, Sirota (2013) found that 78.6% of the health professionals included in his study, however, expressed the need to include teaching about TGD health in university curricula; however, only 28.1% of those nursing educators did capable of teaching. Lim *et al*. (2015) showed that TGD health topics were absent in 75% of educator training courses. This lack of coverage of specific TGD issues illustrates the need of training in health education (Makhoul *et al*. 2023).

In this regard, studies such as that of Denaro *et al*. (2023) and Tan *et al*. (2023) in which training courses were proposed to improve the state of well-being and acceptance among different young genders. An important problem with training in this sector is that even though they often receive training courses, they do not provide practical tools to actually understand how to act practically (Denaro *et al*. 2023). In the study by Tan *et al*. (2023) the figure for which health professionals were trained autonomously is noted, since the hospitals in which they were hired did not provide any specific training course.

Therefore, self-training is the training path most used by health professionals (Tubertini *et al*. 2023). The lack of education on the part of health professionals is correlated with negative at-titudes, discrimination against TGD people (Hobster and McLuskey 2020). For example, the study by Von-Vogelsang *et al*. (2016), showed that health professionals are aware of the poor education in TGD, health, and disease, and therefore have expressed the need to im-plement the knowledge. Studies such as those by Kosa *et al*. (2023) and by San (2023), through the use of simulators and digital medicine in training courses, have found a significant interest of students in learning the TGD culture as a health professional background, emphasizing the degree of inclusion of future health professionals. On the positive aspects of training as a relational tool with TGD patients, the available literature seems to be in agreement, also in considering it as a tool to break down the barriers to access to health services (Kosa *et al*. 2023).

Actually, in Italy, there are 96 universities[3] and there is no single training course on TGD health in degree courses. Regarding postgraduate training according Alma-Laurea, that is, a public Interuniversity Consortium, there is not specific course on TGD health[4]. To date, among the specific courses on the topic, as an example, the following have been recently provided:

[3] https://aomobile.almalaurea.it/news/news.aspx?id=11&BACK=1
[4] https://www2.almalaurea.it/cgi-asp/lau/corsi/risultati.aspx?lang=it&tipologie=M1,M2,DR,AF,CF,CP&tipobacheca=2&anni=2023,2022&fulltext=transgender&from=cerca

- an online by the Istituto Superiore di Sanità (Higher Institute of Health) entitled "The TGD population: from health to law General Information" in the year 2023[5];
- a residency sociology course within a postgraduate course in Angiology of the Magna Graecia University of Catanzaro entitled "Diversity, Health Systems, Migrations and Angiology"[6].

1.1. The aim of the study

The aim of this study is to examine among healthcare professionals the approach, knowledge, and perceptions they have towards caring for TGD people. Having reached this point, this research started from a general research question: What is the state of the art in Italy, regarding the training, experience, and knowledge of national healthcare professionals about the health and needs of TGD people?

2. Material and methods

2.1. Design

This study was designed as a cross-sectional study to analyze the relations between health care professions and the different health needs of TGD people. This study's reporting conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement, guidelines for reporting observational studies specifically for cross-sectional studies (Supplementary File 1) (Von Elm *et al*. 2014). For these, we used an online survey (Sue and Ritter 2012). The online web-based survey used in this study was conducted using Google Modules.

[5] https://www.eduiss.it/theme/tcontinuum/infocourse.php?course=453&popup=1
[6] https://asi.unicz.it/altaformazione/frontend/pages/riepilogo?master_id=358

2.2. Survey Online Structure

The first draft of the survey questions was developed during four online discussions after conducting the necessary literature research and receiving feedback from experts, functioning pilot surveys were conducted with 100 health professionals. The data obtained were not used for the final analysis. The survey was built based on the aim of this paper. There are 18 questions that organized in different areas:

1) demographic area: this section includes questions on age, gender, qualification, region, years of experience etc.;
2) notions about TGD health;
3) experience and considerations on TGD interaction.

Open-ended, dichotomous (ratings of 'Yes' or 'No'), multiple, and Likert scales were rated on a five-point (Supplementary File 2).

2.3. Procedures in Place to Check against Bots Completing the Survey

Although the risk of bots completing the survey was low, as this survey provided no compensation for participants, three open-ended questions (age; educational qualification — "Other Master's degree" option; actual work — "other" option), located at the be-ginning of the survey, were used to detect bots and enabled us to check the answers for consistency.

2.4. Participants

The participants of the survey would be health care professions such as: doctors with all specializations, nurses, midwives, physiotherapists, speech therapists.

2.5. Data Collection

The data were collected between December 2021 and October 2023 using Google Modules, and health care professions were interviewed and divided into five different *geographical* areas, according to the Nomenclature of Statistical

Territorial Units of Italy (NUTS: IT, level 1). Participants were recruited from different networks in organizations, such as hospitals, via email, telephone, and social networks. Participants were also recruited using social media health professionals groups. The recruited participants were invited to use their own social networks to share the link with their colleagues to improve the representativeness of the sample.

2.6. Data Analysis

Statistical analysis was carried out on version April 1, 1106-2009e2021 RStudio, PBC. Continuous variables were analyzed by one-way ANOVA test, after verifying their normal distribution and homoscedasticity using the Shapiro–Wilk normality test and F test, respectively. All continuous variables were also subjected to post hoc analysis using the Tuckey test to show any significant comparison. Categorical variables were analyzed with a sample test for the equality of proportions without continuity correction.

3. Results

No bots completing the survey were detected and all answers were considered eligible for analysis. A total of 605 health professionals were interviewed and divide[7]d into five different geographical areas, according to the Nomenclature of Statistical Territorial Units of Italy (Fig. 1).

[7] https://ec.europa.eu/eurostat/web/nuts/nuts-maps

As regards the average of those interviewed throughout the national territory, it is completely similar and is 39.3 ± 8.9, but there is no specific significance. Regarding gender, at the national level, men and women are roughly similar, women 268 (44.2%) and men 330 (54.5%), and no significance was detected in comparisons between geographical areas.

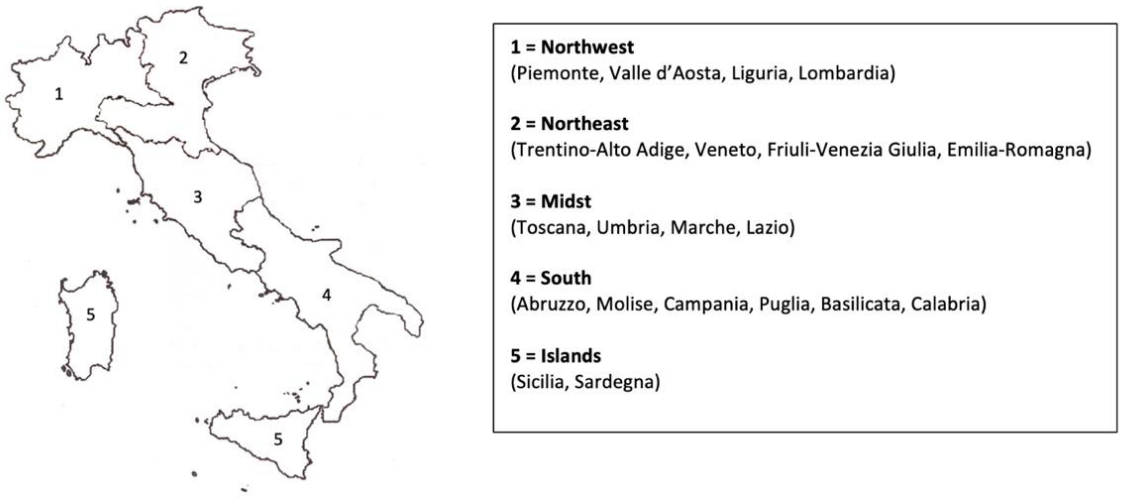

Fig. 1 - Italian geographical areas according
to the Nomenclature of Statistical Territorial Units of Italy (NUTS: IT)

Regarding educational qualifications at the bachelor's degree level, the most frequent was that in nursing throughout Italy, in the comparison between the South and the Islands, the qualification in physiotherapy was significant with a p-value of 0,046. Islands showed the highest rate of physiotherapists (7.6%) with a significant difference (p-value 0.046) between the South which had the lowest (1.4%). Regarding master's degrees, the degree in medicine was the most present without significant differences between geographical areas.

While a significance was detected in the comparison between North-west and South for the master's degree in nursing and midwifery sciences with a p-value of 0,048, with more master's graduates in the South.

Regarding the occupations of the respondents, in the order: 300 (49.5%) physicians, 190 (31.4%) nurses, midwifes, 30 (4.9%), and other health professionals

85 (14%); there are a series of significances in the comparisons between the different geographical areas that concern the "other" answer which includes healthcare professions such as speech therapists, healthcare technicians, dentists, dietitians, midwives, physiotherapist etc.

The Italian facilities (public, semi-private, and private) showed a certain significance in the comparison between public facilities in the North-West and the South (p-value 0.025), North-East and the South (p-value 0.038); semi-private is significant in the comparison between the North-east and the South (p-value 0.035) and between the North-west and the South (p-value 0.038).

Finally, as regards the years of service, the national average is 11.4 ± 7.6 years, and as a variable it is significant in comparisons between the North-west and the South (p-value 0.011), with more years of service in the North-east. All details are shown in Table 3.

Tables 4 and 5 contain analysis, and comparison of the responses, and a general overview.

Specifically, question 1.1. produced a series of significances. The respondents placed themselves at an average score equal to 2.4 ± 1.3 and therefore at a rather low value and this can be seen in the comparison of all geographical areas with a p-value of 0.012. The South has the highest average (2.7 ± 1.4), while the North-east (2.2 ± 1.3) and the Midst (2.2 ± 1.2) have the lowest averages and from the comparison a series of significances have been derived for which the South considers gender and sexual orientation as variables that impact health, in general is slightly higher than in other geographical areas. These results, as also in the subsequent analyzes of the other answers, moreover, depend on the fact that the number of respondents from the South is higher.

Demographic characteristics	*Overall (N=605)*	*North-west (n=119)*	*North-east (n=109)*	*Midst (n=120)*	*South (n=205)*	*Islands (n=52)*	*p-value (<0.05)*
Age (years)	39.3 ± 8.9	42.4 ± 11.7	42.8 ± 10.7	42.1± 11.9	40.4±10.2	42.1± 10.6	0.140
Women	268 (44.2%)	52 (43.6%)	42 (38.5%)	53 (44.1%)	102 (49.7%)	19 (36.5%)	0.264
Men	330 (54.5%)	65 (54.6%)	67 (61.4%)	65 (54.1%)	100 (48.7%)	33 (63.4%)	0.163
Other	7 (1.1%)	2 (1.6%)	0 (0%)	2 (1.6%)	3 (1.4%)	0 (0%)	0.624
Educational qualification							
Bachelor's degree	301 (49.7%)	64 (53.7%)	55 (50.4%)	52 (43.3%)	109 (53.1%)	21 (40.3%)	0.234
None	304 (50.2%)	55 (46.2%)	54 (49.5%)	68 (56.6%)	96 (46.8%)	31 (59.6%)	0.234
Nursing	192 (31.7%)	39 (32.7%)	30 (27.5%)	35 (29.1%)	75 (36.5%)	13 (25%)	0.327
Obstetrics	31 (5.1%)	3 (2.5%)	5 (4.5%)	5 (4.1%)	16 (7.8%)	2 (3.8%)	0.271
Physiotherapy	22 (3.6%)	6 (5%)	6 (5.5%)	3 (2.5%)	3 (1.4%)	4 (7.6%)	0.116
	-	-	-	-	3 (1.4%)	4 (7.6%)	0.046*
Other	56 (9.2%)	16 (13.4%)	14 (12.8%)	9 (7.5%)	15 (7.3%)	2 (3.8%)	0.119
Master's degree	336 (55.5%)	58 (48.7%)	58 (53.2%)	73 (60.8%)	113 (55.1%)	34 (65.3%)	0.207
None	269 (44.4%)	61 (51.2%)	51 (46.7%)	47 (39.1%)	92 (44.8%)	18 (34.6%)	0.208
Medicine	304 (50.2%)	55 (46.2%)	54 (49.5%)	69 (57.5%)	95 (46.3%)	31 (59.6%)	0.171
Nursing and Mid-wifery Sciences	32 (5.2%)	3 (2.5%)	4 (3.6%)	4 (3.3%)	18 (8.7%)	3 (5.7%)	0.080
	-	3 (2.5%)	-	-	18 (8.7%)	-	0.048*
Occupation							
Physician	300 (49.5%)	53 (44.5%)	54 (49.5%)	68 (56.6%)	95 (46.3%)	30 (57.6%)	0.210

Nurse	190 (31.4%)	39 (32.7%)	29 (26.6%)	36 (30%)	74 (36.1%)	12 (23%)	0.272
Midwife	30 (4.9%)	3 (2.5%)	5 (4.5%)	4 (3.3%)	16 (7.8%)	2 (3.8%)	0.209
Other	85 (14%)	24 (20.1%)	21 (19.2%)	12 (10%)	20 (9.7%)	8 (15.3%)	0.026*
	-	24 (20.1%)	-	-	20 (9.7%)	-	0.013*
	-	24 (20.1%)	-	12 (10%)	-	-	0.043*
	-	-	21 (19.2%)	-	20 (9.7%)	-	0.027*
Facility							
Public	384 (63.4%)	67 (56.3%)	62 (56.8%)	81 (67.5%)	142 (69.2%)	32 (61.5%)	0.072
	-	67 (56.3%)	-	-	142 (69.2%)	-	0.025*
	-	-	62 (56.8%)	-	142 (69.2%)	-	0.038*
Semi-private	175 (28.9%)	42 (35.2%)	39 (35.7%)	30 (25%)	49 (23.9%)	15 (28.8%)	0.082
			39 (35.7%)		49 (23.9%)		0.035*
	-	42 (35.2%)	-	-	49 (23.9%)	-	0.038*
Private	46 (7.6%)	10 (8.4%)	8 (7.3%)	9 (7.5%)	14 (6.8%)	5 (9.6%)	0.963
Years of service	11.4 ± 7.6	13.8 ± 10.6	12.6 ± 9.2	12.3 ± 9.9	10.3 ± 8.3	10.1 ± 7.3	0.198
	-	13.8 ± 10.6	-	-	10.3 ± 8.3	-	0.011*

*At least one significant comparison on the post hoc analysis

Table 3 - Population data

Completely similar results were also obtained regarding question 1.2 in which respondents at the national level attribute medium-low importance to training on the health of TGD people, just thinking of the fact that the general average score is equal to 2.6 ± 1.3and this resulted in a series of significances both in all geographical areas and in pairwise comparisons in which the North-east is once again the geographical area with a lower average (2.3 ± 1.1).

Concerning question 1.4., although there is no significance, it is interesting to note a difference from the previous questions, here the respondents give a high average score with a national average of 2.9 ± 1.3 and therefore do not recognize the important difficulties that TGD people encounter in healthcare compared to cisgender patients.

From the analyzes related to question 1.5. concerning the acronym TGD people, it emerges that it is known throughout Italy, only 156 (25.7%) out of 605 answered correctly compared to the other 449 who provided incorrect answers or stated not to know the meaning of the acronym and Table 5 shows all meanings by region.

Regarding the training provided by healthcare institutions on TGD health, 577 respondents, i.e., 95.3%, declared that they had not obtained specific training, and this is completely similar in all geographical areas, while only 28 (4.6%) respondents responded yes.

Exactly 537 (88.7%) respondents declared that they did not know either the WPATH or the standards of care that it promotes, and the trend is completely similar in all areas considered.

Question 1.8 is very interesting because in all geographical areas the respondents stated that they had come into contact with a TGD patient with a general average of 427 (70.5%) who answered in the affirmative where it is especially in the North and South that we find the highest percentages and important significance.

Question	*Overall (N=605)*	*North-west (n=119)*	*North-east (n=109)*	*Midst (n=120)*	*South (n=205)*	*Islands (n=52)*	*p-value (<0.05)*
1.1. Do you think that issues of gender, sexual orientation etc. are they important for maintaining or restoring patients' health? Not important at all 1, 2, 3, 4, 5 Extremely important	2.4 ± 1.3	2.3 ± 1.3	2.2 ± 1.3	2.2 ± 1.2	2.7 ± 1.4	2.5 ± 1.2	0.012*
	-	-	2.2 ± 1.3	-	2.7 ± 1.4	-	0.012*
	-	-	-	2.2 ± 1.2	2.7 ± 1.4	-	0.013*
1.2. Do you think it is important to be able to participate in training activities regarding the health of transgender people? Not important at all 1, 2, 3, 4, 5 Extremely important	2.6 ± 1.3	2.5 ± 1.2	2.3 ± 1.1	2.4 ± 1.2	3.0 ± 1.3	2.5 ± 1.3	0.001*
	-	2.5 ± 1.2	-	-	3.0 ± 1.3	-	0.002*
	-	-	2.3 ± 1.1	-	3.0 ± 1.3	-	<0.001*
	-	-	-	2.4 ± 1.2	3.0 ± 1.3	-	<0.001*
1.3. How did you feel, or would you feel about having a transgender person in your care? Not at all comfortable 1, 2, 3, 4, 5 Totally at ease	2.8 ± 1.4	2.5 ± 1.3	2.5 ± 1.3	2.6 ± 1.3	3.3 ± 1.5	2.8 ± 1.5	<0.001*
	-	2.5 ± 1.3	-	-	3.3 ± 1.5	-	<0.001*
	-	-	2.5 ± 1.3	-	3.3 ± 1.5	-	<0.001*
	-	-	-	2.6 ± 1.3	3.3 ± 1.5	-	<0.001*
1.4. Do you think TGD patients have more difficulties in healthcare compared to cisgender patients? I don't agree at all 1, 2, 3, 4, 5 Totally agree	2.9 ± 1.3	3.1 ± 1.2	2.9 ± 1.3	2.8 ± 1.2	3.0 ± 1.3	2.9 ± 1.4	0.617

* At least one significant comparison on the post hoc analysis.

Table 4 – Competence Area 1

Question	Overall (N=605)	North-west (n=119)	North-east (n=109)	Midst (n=120)	South (n=205)	Islands (n=52)	p-value (<0.05)
1.5. What does the acronym mean TGD people?							
a. Total Gender Diverse People	104 (17.2%)	19 (15.9%)	25 (22.9%)	26 (21.6%)	24 (11.7%)	10 (19.2%)	0.065
	-	-	25 (22.9%)	-	24 (11.7%)	-	0.014*
	-	-	-	26 (21.6%)	24 (11.7%)	-	0.024*
b. Transgender and Gender Diverse People (**CORRECT**)	156 (25.7%)	29 (24.3%)	16 (14.6%)	22 (18.3%)	75 (36.5%)	14 (26.9%)	<0.001*
	-	-	16 (14.6%)	-	75 (36.5%)	-	<0.001*
	-	-	-	22 (18.3%)	75 (36.5%)	-	<0.001*
	-	29 (24.3%)	-	-	75 (36.5%)	-	0.031*
c. Transgender Genus Determinated People	121 (20%)	25 (21%)	27 (24.7%)	24 (20%)	40 (19.5%)	5 (9.6%)	0.271
	-	-	27 (24.7%)	-	-	5 (9.6%)	0.041
d. Transgender and gentle dynamic people	48 (7.9%)	12 (10%)	7 (6.4%)	13 (10.8%)	14 (6.8%)	2 (3.8%)	0.405
e. I don't know	176 (29.1%)	34 (28.5%)	34 (31.9%)	35 (29.1%)	52 (25.3%)	21 (40.3%)	0.320
	-	-	-	-	52 (25.3%)	21 (40.3%)	0.048*
1.6. Has the company you work provided training courses on the health of transgender people?							
a. Yes	28 (4.6%)	4 (3.3%)	10 (9.1%)	3 (2.5%)	10 (4.8%)	1 (1.9%)	0.104
b. No	577 (95.3%)	115 (96.6%)	99 (90.8%)	117 (97.5%)	195 (95.1%)	51 (98%)	0.104
1.7. Have you ever heard of WPATH and the Standards of Care that it promotes?							
a. Yes	68 (11.2%)	14 (11.7%)	14 (12.8%)	10 (8.3%)	21 (10.2%)	9 (17.3%)	0.485
b. No	537 (88.7%)	105 (88.2%)	95 (87.1%)	110 (91.6%)	184 (89.7%)	43 (82.6%)	0.485
1.8 Have you ever come into contact with a transgender patient?							

a. Yes	427 (70.5%)	82 (68.9%)	88 (80.7%)	82 (68.3%)	132 (64.3%)	43 (82.6%)	0.009*
	-	-	-	-	132 (64.3%)	43 (82.6%)	0.018*
	-	-	88 (80.7%)	-	132 (64.3%)	-	0.004*
b. No	178 (29.4%)	37 (31.1%)	21 (19.2%)	38 (31.6%)	73 (35.6%)	9 (17.3%)	0.009*
1.9. In your opinion, what are the main barriers facing transgender people encounter in healthcare contexts?							
a. Structural (bathrooms for men and women only; medical records that provide only two genders; hospitalizations separated by gender etc.).	306 (50.5%)	65 (54.6%)	64 (58.7%)	78 (65%)	76 (37%)	23 (44.2%)	<0.001*
	-	-	-	78 (65%)	76 (37%)	-	<0.001*
	-	-	-	78 (65%)	-	23 (44.2%)	0.017*
	-	-	64 (58.7%)	-	76 (37%)	-	<0.001*
b. Social (incorrect knowledge of pronouns; stigmatizing attitudes etc.).	26 (4.3%)	2 (1.6%)	4 (3.6%)	2 (1.6%)	13 (6.3%)	5 (9.6%)	0.044*
	-	2 (1.6%)	-	-	-	5 (9.6%)	0.046*
	-	-	-	2 (1.6%)	-	5 (9.6%)	0.045*
c. Individual (perception of stigma by the transgender patient; difficulty ad gain consideration etc.)	154 (25.4%)	38 (31.9%)	30 (27.5%)	29 (24.1%)	42 (20.4%)	15 (28.8%)	0.201
	-	38 (31.9%)	-	-	42 (20.4%)	-	0.030*
d. All previous Answers	119 (19.6%)	14 (11.7%)	11 (10.1%)	11 (9.1%)	74 (36.1%)	9 (17.3%)	<0.001*
	-	14 (11.7%)	-	-	74 (36.1%)	-	<0.001*
	-	-	11 (10.1%)	-	74 (36.1%)	-	<0.001*
	-	-	-	11 (9.1%)	74 (36.1%)	-	<0.001*
	-	-	-	-	74 (36.1%)	9 (17.3%)	0.015*

* At least one significant comparison on the post hoc analysis

Table 5 – Competence Area 2

About the type of barriers in healthcare that, according to health professionals, TGD people encounter most frequently, the most frequent ones, selected individually, are the structural ones for 306 (50.5%) respondents, followed by individual ones with 154 respondents (25.4%) while the social barriers were less

selected with only 26 (4.3%) respondents; while a unitary vision according to which all 3 types of barriers would act on TGD health was chosen by only 119 (19.6%) respondents. These response peculiarities showed a series of significance in the pairwise comparisons indicated in Table 5.

4. Discussion

This study aimed to analyze, among Italian healthcare professionals, the knowledge and perceptions that they have towards caring for TGD people and their health.

Results revealed that the Italian healthcare professionals need of general and specific training in TGD health matters.

First of all, the fact that interviewees attribute less importance to gender issues and sexual orientation as variables that influence the health of people in general constitutes a serious critical issue. Gender and sexual orientation are important social determinants of health (SDHs), that is, structural phenomena, rooted in social relations of power that affect health and are not just a mere set of socially prescribed norms, values, roles and behaviors (Bates *et al*. 2009). Even stronger is the relationship between SDHs and the health of TGD people, therefore the SDHs are considered prevalent factors in their life with a strong association through the health dimension (Blosnich *et al*. 2017). All of this leads to significant forms of inequality that lead TGD people to avoid healthcare settings (Costa *et al*. 2018).

Regarding the consideration by health professionals regarding any training courses on TGD health, we must start from the assumption that there is minimal or no attendance of subjects related to TGD health in undergraduate health professionals (Hana *et al*. 2021). And this is not just an Italian problem. In this regard, many studies (Mert-Karadas *et al*. 2023; Moretti-Pires *et al*. 2020; Sharma 2018) have analysed the prejudices of students in health professionals and degrees of prejudice against TGD individuals have been detected, precisely

due to lack of training, which then leads to negative effects when TGD people become their patients.

The topic of education is important because in the results obtained, it was seen that a large part of the respondents did not know either the World Professional Association for Transgender Health (WPATH is a non-profit, interdisciplinary professional[8] and educational organization devoted to TGD health) or the Standards of Care (SOC, and their goal is to provide clinical guidance for health professionals to assist transsexual, transgender, and gender nonconforming people with safe and effective pathways to achieving lasting personal comfort with their gendered selves, in order to maximize their overall health, psychological well-being, and self-fulfilment), this is because, not only in Italy, also considering[9] postgraduate-level education, there is variability of exposure to learning opportunities focused on TGD health, with healthcare trainees that feel to be inadequately prepared or with not appropriate experience to care for TGD patients (Costa *et al*. 2018). For example, in a similar study such that of Burgwal *et al*. (2021) in a survey of over 800 healthcare providers in Europe, it was found that only 52.7% of HCP had received some form of training on TGD health, a higher figure than to our findings. Chang *et al*. (2018) found that of 76 female pelvic medicine and reconstructive surgery fellows surveyed, 74% had no experience caring for transgender patients and 70% had no training on transgender health despite being at institutions that perform female to male gender confirming surgery.

Thus, according to the results obtained, it is necessary to better grasp the point of view of TGD people, in order to make available the knowledge of their embodied experience of the TGD experience in health (https://www.lgbthealtheducation.org/lgbt-education/cme/). This makes it necessary for health professionals, and beyond, to be able to implement actions

[8] https://www.wpath.org/about/mission-and-vision
[9] https://www.wpath.org/publications/soc

and proposals that can favour changes starting with legal ones and then reforming health systems (Costa 2023b, c).

Furthermore, frequent barriers to health for TGD people are represented by healthcare providers' lack of knowledge and skills with subsequent inability to provide competent care (Borgwal *et al*. 2021). Barriers to TGD health were analysed in our study and structural barriers were found to be the most present, as indicated by the respondents, 50.5% be-coming significant not only at the national level but also in pairwise comparisons between different geographical areas.

There is no doubt, however, that structural barriers are important especially among the most limiting barriers to TGD health at the macrosocial level (Costa 2023b) but indeed they should not be considered as the only ones. However, the fact that, on the one hand only 19.6% of the respondents recognized the importance of all types of barriers, and on the other hand, the limited importance attributed to social barriers, only 4.3% of the respondents, makes the need for training that is not only biomedical but based on sociological and psychological perspectives on TGD health. In this regard, we re-member that social barriers mean "experiences with a high level of both perceived and internalized social stigma, social isolation, discrimination, victimization, incorrect knowledge of pronouns etc." (Costa 2023b, 19). This is a central aspect, because TGD people require that healthcare professionals act with respect starting from the use of the correct pronoun; act ethically without discussing or asking about the gender chosen by transgender patients; all this, in fact, is considered by transgender people as discriminatory (Carlström *et al*. 2020). All this is of great importance because the social aspects, combined with other types of barriers, negatively impact the health of TGD people (Caravaca-Morera and Padilha 2017).

In this regard, the current literature shows how the feeling of vulnerability of TGD people, together with low self-esteem and non-acceptance by society, constitute one of the main causes of delay in access and in health care, because

they are afraid of non-acceptance by health professionals (Hobster and McLuskey 2020). Furthermore, TGD people argue that one of the reasons why health professionals do not provide adequate services and assistance is due to the absolute lack of knowledge of the gender transition pathway, transgender culture etc. (Carlström *et al*. 2020).

Furthermore, from the results obtained, it is clear that the lack of training is harmful, in the form of barriers, not only for social aspects in the strict sense, but also for the health of TGD people. Being a TGD person means, first of all, accessing to several health services in order to act and modify one's body through some treatments such as surgery, taking hormones etc. (Westerbotn *et al*. 2017). According to our results, Westerbotn *et al*. (2017) in their study found some anxiety on the part of TGD people in interfacing with health professionals for fear of being misunderstood or mistreated about their gender identity. In the same study, moreover, it is found that this form of anxiety has delayed the research of health services. Persson Tholin *et al*. (2018) found negative feelings on the part of TGD people towards health professionals and not only so much so that they feel considered as non-people, and judged negatively, so much so that they are not taken seriously, therefore, they have also in this case, delayed access to health facilities as much as possible.

4.1. Strengths and limitations of the study

We recognize the strengths and limitations of the present study. The first advantage lies in the fact that, being a cross-sectional study, it was conducted relatively more quickly and was inexpensive. This study design is certainly useful for public health planning, monitoring, and evaluation regarding TGD health. Furthermore, it allows you to have a quick and updated perspective on the current state of the art regarding health professionals and the health of TGD people. Regarding the limitations we highlighted: the findings are observational due to the cross-sectional structure of the study design; the online web-based survey may lead to selection bias and limit the generalizability of the study;

the assessment of competence areas is based on self-reporting, and the participants may perceive in different ways the items that were investigated. Certainly, another limitation is linked to the social desirability bias which is typical of all questionnaires.

4.2. Implications for Education, Policy and Future Research

The results obtained from this research can be useful in attempting to propose a series of ideas for education paths and related health policy in TGD health for health professionals. Some key elements for comprehensive TGD health education could be:

a. Cultural humility and anti-oppression training. Trainee health professionals need a firm grounding in topics such as cultural humility, intersectionality, and oppression and how these are related to inequities in health outcomes. Intersectionality describes how the interconnected nature of aspects of one's identity (such as one's gender, race, and class) leads to different experiences of privilege and discrimination for individuals in a society. Such training is an important precursor to understanding why inequities exist in TGD health. These issues also provide a foundation in order to address these inequities.
b. Involvement of community members. TGD health curricula should be developed in consultation with TGD community members. A participatory action research approach with TGD community members can help develop and improve education. Community members should be adequately remunerated for their involvement and for their time.
b. Integration of TGD health. TGD health should be integrated longitudinally into undergraduate and postgraduate healthcare curricula, rather than isolated into single lessons on the care of TGD people. This training should include material both on TGD-specific health (such as the use of hormones), on caring for TGD people with general health needs, and on

all psycho-sociological aspects of gender issues. All healthcare providers will likely have TGD patients in their practice, regardless of region of residence or specialty. Healthcare professionals must therefore be comfortable with gender diversity in their daily practice and have tailored healthcare training for TGD.

c. Practice-focused and in situ training. Practice-focused training can be performed through advanced didactic methods, case-based learning, and simulated consultations. Future research must strive to deepen and improve the topics identified in this paper by suggesting new strategies to improve the training of healthcare personnel on TGD health.

5. Conclusions

The results of this research show that the Italian health professionals are aware of their own lack of knowledge about the healthcare needs of TGD people. Physician, nurses etc. states that, both in their university training and during their ongoing training, they did not acquire the necessary knowledge or skills for helping minority groups of this type. Furthermore, data from across the world demonstrate that health professionals and postgraduate and undergraduate health professional students are not fully equipped to provide high-quality and comprehensive care to TGD patients. Integrating holistic approaches to their care in medical school curricula supports the development of health systems that are able to address the needs of these people, also by the improvement of health professionals' skills and specific education.

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Supplementary File 1

STROBE Statement — Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2
Objectives	3	State specific objectives, including any prespecified hypotheses	8
Methods			
Study design	4	Present key elements of study design early in the paper	8
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8-10
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	9
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	10
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*10*
Bias	9	Describe any efforts to address potential sources of bias	n.a.
Study size	10	Explain how the study size was arrived at	10
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	10
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10
		(*b*) Describe any methods used to examine subgroups and interactions	10
		(*c*) Explain how missing data were addressed	n.a.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	n.a.
		(*e*) Describe any sensitivity analyses	n.a.
Results			
Participants *	13	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	n.a.
		(c) Consider use of a flow diagram	n.a

Descriptive data *	14	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10-12
		(b) Indicate number of participants with missing data for each variable of interest	n.a.
Outcome data	15*	Report numbers of outcome events or summary measures	10-16
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n.a.
		(*b*) Report category boundaries when continuous variables were categorized	n.a.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n.a.
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10-16
Discussion			
Key results	18	Summarise key results with reference to study objectives	16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	19
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16-20
Generalisability	21	Discuss the generalisability (external validity) of the study results	n.a.
Other information			
Funding study	22	Give the source of funding and the role of the funders for the present and, if applicable, for the original study on which the present article is based	n.a.

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Supplementary File 2

Evaluation of the level of knowledge of transgender people's health by healthprofessionals

You were invited to participate in a survey that aims to assess health professionals' knowledge and possible experiences with transgender people within healthcare settings. This survey, therefore, aims to collect information aimed at improving the quality ofhealthcare for transgender people with health needs, in order to make healthcare increasingly capable of facing the challenges of diversity, and therefore be the most inclusiveas possible. Please note that the questionnaire is anonymous.

1 **Gender**

a. Man

b. Woman

c. Other

2 **Age** (Open answer)

3 **Bachelor's degree** (Open answer)

4 **Master's degree** (Open answer)

6 **Health Profession** (Open answer)

7 **Working region** (Open answer)

8 **Type of facility where you are employed**

a. Public

b. Semiprivate

c. Private

9 **Total years of service** (Open answer)

10) **Do you think that issues of gender, sexual orientation, etc. Are they important formaintaining or restoring patients' health?**

1 not important at all

2

3

4

5 extremely important

11) **What does the acronym mean TGD people ?**

A) **Total Gender Diverse People**

B) **Transgender and Gender Diverse People**

C) **Transgender Genus Determinated People**

D) **Transgender and gentle dynamic people**

E) **OTHER**

12) **Has the company you work provided training courses on the health of transgenderpeople?**

Yes

NO

13) **Do you think it is important to be able to participate in training activities regardingthe health of transgender people?**

1 not important at all

2

3

4

5 extremely important

14) **Have you ever heard of WPATH and the Standards of Care that it promotes?**

a. Yes

b. No

15) **Have you ever come into contact with a transgender patient?**

a. Yes

b. No

16) **How did you feel, or would you feel about having a transgender person in your care?**

1 not at all comfortable

2

3

4

5 totally at ease

17) **Do you think TGD patients have more difficulties in healthcare? compared tocisgender patients?**

1 I don't agree at

all2

3

4

5 Totally agree

18) **In your opinion, what are the main barriers facing transgender people encounter inhealthcare contexts?**

a. A Structural (bathrooms for men and women only; medical records that provide only two genders; hospitalizations separated by gender; etc.)

b. B Social (incorrect knowledge of pronouns; stigmatizing attitudes; etc.)

c. C Individual (perception of stigma by the transgender patient; difficulty ad gain consideration; etc.)

d. D All previous answers