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## COVID-19

# Mental Health and Endocrine Telemedicine Consultations in Transgender Subjects During the COVID-19 Outbreak in Italy: A Cross-Sectional Web-Based Survey



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## ABSTRACT

**Background:** Transgender people are a vulnerable group with a higher incidence of mental health issues and, during the COVID-19 outbreak, they may have faced psychological, physical and social obstacles.

**Aim:** To evaluate the impact of the pandemic and the access to health care services during the COVID-19 pandemic on the mental health of the transgender people living in Italy.

**Methods:** An anonymous web-based survey was conducted among transgender people living in Italy.

**Outcomes:** The survey consisted of 41 questions (to address socio-demographic and COVID-19 related variables, general health problems and trans-related health issues) and three validated questionnaires (the Impact of Event Scale [IES], the Beck Depression Inventory [BDI-II] and the SF-12).

**Results:** In total 108 respondents were included in the analysis, of these 73.1% were transmen and 26.9% transwomen. The mean age was  $34.3 \pm 11.7$  years with 88.9% undergoing gender affirming hormonal treatment (GAHT). Of these respondents 55.6% were not working during the COVID-19 pandemic, mainly because they lost their jobs due to the lockdown (30.5%) or because they were otherwise unemployed (25.0%). Only four subjects were quarantined at home because of a positive COVID-19 swab. The mean total IES score was  $21.1 \pm 14.9$  with 24.1% of subjects scoring over the cut-off score of 26 thereby suggesting a moderate-to-severe impact of the pandemic event. Mean BDI score was  $8.6 \pm 8.4$ . SF-12 total mean score was  $96.1 \pm 11.9$  with a Mental Component Summary (MCS) score of  $42.8 \pm 9.1$ . Access to endocrinological consultations for hormonal prescription via telemedicine services was associated with better IES total scores ( $P = .01$ ).

**Clinical Implications:** Our results highlight the impact of the pandemic on the mental health of this particular population and how telemedicine services may serve to mitigate negative psychological effects.

**Strengths & Limitations:** Internet-based surveys may select a group of people not necessary representative of the whole population. The self-reporting bias should also be considered. Those who responded to our survey were mainly from northern Italy where COVID-19 has had a greater impact.

**Conclusion:** Vulnerable groups such as the transgender population should receive more consideration also during pandemic events and their access to health services especially for endocrine and mental health care should be improved. A nationwide plan for the extended use of telemedicine should be established with targeted intervention to reduce psychological distress. **Gava G, Fisher AD, Alvisi S, et al. Mental Health and Endocrine Telemedicine Consultations in Transgender Subjects During the COVID-19 Outbreak in Italy: A Cross-Sectional Web-Based Survey. J Sex Med 2021;18:900–907.**

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## INTRODUCTION

Italy was the first European country to handle the emergency of COVID-19 outbreak in Europe and at the time of writing there was total of 1.843.712 cases with 64.520 deaths.<sup>1</sup> During lockdown social distancing was a necessary strategy to halt the spread of the virus, however it may also have increased anxiety, stress, symptoms of depression and sleep problems.<sup>2</sup> The COVID-19 outbreak may have brought psychological distress especially to those more prone to mental health issues and those with less social support.

Nowadays, transgender people are still an extremely socially and medically vulnerable group with a higher incidence of mental health problems than their cisgender counterparts<sup>3</sup> and during the COVID-19 pandemic, they may have faced several psychological, physical and social difficulties.<sup>4–6</sup> During this period, some transgender subjects may also have experienced difficulties in access to health care services for hormonal treatment prescriptions or to receive mental health support. During lockdown surgeries for urgent and non-deferrable oncological cases were prioritized,<sup>7</sup> and elective gender-affirming surgical interventions (GASI) were postponed in the majority of Italian centers. Considering the positive role of GASI on the mental health of many of these subjects,<sup>8</sup> this need to defer gender-affirming treatments may have further impaired their mental wellbeing.<sup>9</sup> It should also be considered that binary gender policies in society and in the world of work may worsen the inequalities for transgender subjects and so potentially increasing risks associated to COVID-19 infection.<sup>10</sup>

Recently published data highlights the increase of psychological distress, anxiety and depression experienced by young lesbian, gay, bisexual, and transgender during the pandemic.<sup>11</sup> Research on this topic is still growing with a preprint reporting data from the global COVID-19 Disparities Survey on 964 transgender and non-binary adults: they reported a reduced access to gender-affirming resources and an increased prevalence of depression, anxiety, and suicidal ideation in those experiencing reduced access to health services.<sup>12</sup> And data from the large Transcarecovid-19 survey recently confirmed that transgender people suffered under the severity of the pandemic even more than the general population.<sup>13</sup>

To reduce the negative impact of the pandemic in the transgender population, some centers offered the possibility to continue endocrine and mental health care visits with the support of telemedicine, defined as the delivery of health care services using information and communication technologies, where the distance or the social distancing are critical factors.<sup>14</sup>

The primary objective of this study was to assess the impact of the outbreak of COVID-19 on access to healthcare and the mental health of transgender people living in Italy using a web-based survey consisting of validated questionnaires and topic-specific questions. This survey will enable us to understand the steps necessary to help transgender subjects in the context of a pandemic and whether the use of telemedicine has had a positive effect. Secondary outcomes were the assessment of the availability of

telemedicine services for endocrine and mental health care and the subject's satisfaction with these services.

## MATERIAL AND METHODS

### Study Participants

This study is based on a web-based survey conducted in Italy between May 20, 2020 and June 20, 2020 among transgender people living in Italy. Participants were recruited via email invitations sent by one of the largest communities for lesbian, gay, bisexual, transgender, and queer (LGBTQ) people in Italy (Movimento Identità Trans *online*, MIT). Furthermore in this way we aimed to obtain also a snowball sampling effect as the link was sharable. The survey was sent to subjects known to identify as transgender (individuals whose gender identity differs from the sex assigned at birth); but, recognizing the possibility of a snowball sampling effect, potential participants were asked to complete the survey only if they consider themselves transgender. The survey was read and approved by the associations steering committee which includes also transgender persons.

The survey was completely anonymous and no personal data permitting identification of subjects was collected. Participants received no monetary or other incentives for completion of the survey.

The study protocol, including recruitment and consent procedures, was approved by the Medical Ethics Committee of S. Orsola Hospital, Bologna, Italy (513/2020/Oss/AOUBo) and registered on ClinicalTrials.gov (Identifier: NCT00146146). Participation in the study was possible only after clicking “Yes, I would like to participate in the study” on an anonymous electronic consent form.

### Survey Design

The survey consisted of 41 questions and three validated questionnaires. Questions were designed to assess four particular areas of the investigated population: socio-demographic variables, general health problems, trans-related health issues and COVID-19 related questions. Respondents could check one or more boxes to answer some questions and/or they had the option to directly enter a response.

Socio-demographic information collected included: (i) age, (ii) assigned sex at birth, (iii) city of residence (habitual and during COVID-19 lockdown), (iv) education, (v) employment status, (vi) annual income (in Euro). Participants were asked if they had any relevant known illness, in particular the presence of diabetes, hypertension, and obesity was assessed. Respondents were also requested to indicate any drugs they were on at the time of survey completion together with their height and weight. Trans-related healthcare issues were investigated: subjects were asked if they were currently using GAHT or were willing to and if they had undergone GASI or not. The duration of GAHT and time from GASI were also investigated.

In regard to the COVID-19 pandemic some questions were asked to assess if the subject had tested positive for Coronavirus,

their knowledge of risk factors and symptoms associated with the infection, to evaluate their perception of the risk to death due to COVID-19 (on a 0-3 scale) and their fear of infecting themselves or their relatives (0-10 scale). Housing conditions during the pandemic were investigated. The availability of telemedicine for endocrine and mental health care was also assessed. If the service was available, participants were asked to record their satisfaction with it (0-10 scale).

Three validated questionnaires were used: the Impact of Event Scale (IES), the Beck Depression Inventory (BDI-II) and the SF-12.

A validated Italian version of a 15-item IES was used to assess the extent of traumatic stress due to the pandemic, considering intrusion and avoidance, which are the two most commonly reported experiences in response to stressful events.<sup>15,16</sup> Possible scores for each question ranges were zero (not at all), one (rarely), three (sometimes) or five (often). Questions were organized in the intrusive and avoidance subscales. Single lower scores indicated a less stressful impact and we used a total score cut-off  $\geq 26$  to detect a moderate-to-severe impact.

The BDI is a 21-item self-reporting questionnaire used to measure symptoms of depression, such as irritability, hopelessness and guilt.<sup>17,18</sup> Subjects were asked to choose which sentence best described their emotions over the previous seven days. Each item presented four to six choices with increasing intensity. The BDI is interpreted using cut-off scores: according to Beck,<sup>19</sup> scores from zero to nine indicate minimal or no depression, from 10 to 18 mild to moderate depression, from 19 to 29 moderate to severe depression with scores from 30 to 63 indicating severe depression.

The SF-12 is a health-related quality-of-life questionnaire assessing the impact of health on an individual's everyday life.<sup>20</sup> It measures eight health domains to assess physical and mental health. Answers to the twelve questions assess physical and mental health calculating the Physical Component Summary (PCS) and Mental Component Summary (MCS) scores. Higher scores are associated with better health status. In the general Italian population mean reported scores were 51.2 (7.2) for PCS and 47.8 (10.1) for MCS.<sup>21</sup>

## Data Analysis

All continuous data are expressed as mean and standard deviation of the mean and all categorical data were expressed by frequency rate and percentage. To investigate factors influencing psychological scores multiple linear regression with Bonferroni correction was used. To control for type I error related to multiple testing, the significance level was set at 0.01. Statistical analysis was carried out using Statistical Package for the Social Sciences software, version 23.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

An email invitation to complete the survey was sent to 195 subjects. We received 111 responses and, after having removed three incomplete responses, 108 respondents remained for the analysis. The socio-demographic characteristics of the study

**Table 1.** Socio-demographic characteristics

	N (%)
Age (years)	
Mean $\pm$ SD (range)	34.3 $\pm$ 11.7 (18-61)
Assigned sex at birth	
Female	79 (73.1%)
Male	29 (26.9%)
Geographical area	
North Italy	95 (88%)
Center Italy	8 (7.4%)
South Italy	5 (4.6%)
Education	
Middle school	21 (19.4%)
High school	65 (60.2%)
Degree	20 (18.5%)
Master or PhD	1 (0.9%)
Marital status	
Single	75 (69.4%)
In a relationship	26 (24.1%)
Divorced	7 (5%)
Employment status	
Stable occupation	50 (46.3%)
Occasional work	31 (28.7%)
Unoccupied	27 (25%)
Annual income (Euro)	
< 10.000	42 (38.9%)
10.000 – 20.000	37 (34.3%)
20.000 – 35.000	24 (22.2%)
> 35.000	5 (4.6%)

respondents are detailed in [Table 1](#). The majority of respondents were transmen who were predominantly living in Northern Italy, in Emilia-Romagna in particular. The greater part of the subjects had a job (stable or not) before COVID-19 with an unemployment rate of 25%, which was higher if compared to the general Italian population (unemployment rate at February 2020, 9.7%).<sup>22</sup> The mean income in our population was far lower than the mean annual income in Italy (€ 26.860, in 2019).<sup>23</sup>

## General Health Status

In general subjects were in good health, with 97 subjects (89.9%) reporting no diseases, whereas 11 subjects (10.1%) reported at least one chronic disease (seven hypertension, two diabetes mellitus, one obesity and one hypothyroidism). Mean self-reported body mass index (BMI) was normal ( $23.8 \pm 3.9$ , range 17.6 Kg/m<sup>2</sup> to 42.5 Kg/m<sup>2</sup>). Almost half of participants were smokers (47.2%, N = 51/108) with 19 subjects smoking more than 10 cigarettes per day.

## Trans-Related Status

Seventy-nine (73.1%) subjects identified themselves as transgender men while 29 (26.9%) as transgender women. The vast majority of participants (88.9%, N = 96/108) had been using

GAHT with a mean time of  $4.1 \pm 5.1$  years 39 of whom (36.1%) had undergone GASI  $3.8 \pm 5.6$  years previously. Only 12 subjects were still waiting to start hormonal treatment.

### COVID-19 Related Questions

Fifty-five point six of respondents ( $n = 60/108$ ) were not working during the COVID-19 pandemic, mainly because they had lost their job due to the lockdown (30.5%,  $n = 33/108$ ) or because they were otherwise unemployed (25.0%,  $n = 27/108$ ) whereas 48 (44.4%) continued to work (29 continued to go to work and 19 worked from home).

Considering the whole cohort, subjects stayed outside their homes for  $3.1 \pm 3.7$  hours per day. Only nine subjects lived with other house-mates in a house smaller than 50 square meters, whereas 50% of subjects lived in a house larger than 50 square meters but smaller than 100 square meters. Seventeen point six percent lived alone whereas 29.6% lived with one another person (in the majority of cases the partner or a relative) and 52.8% lived with more than one person (mainly parents or roommates). Only 22.2% reported having a terrace or garden in their home and those without this type of open space reported a low grade of distress,  $5.9 \pm 3.2$ , on a scale ranging from zero to 10.

When assessing symptoms potentially related to COVID-19, five subjects reported fever over  $38^{\circ}\text{C}$ , only one anosmia, seven reported a cough, 15 unusual asthenia, and nine with persistent and unusual arthralgia. Only four subjects were quarantined at home because of a positive COVID-19 swab.

Subjects were more scared of the infection in their relatives,  $7.2 \pm 2.5$  (on a scale from zero to 10) than for themselves,  $5.3 \pm 1.7$  (on a scale from zero to 10) ( $P = .0001$ ).

On a scale from zero to 10, the fear of respondents that the COVID-19 lockdown would make access to GAHT difficult or impossible was  $7.1 \pm 3.0$ . Only 12% of participants believed that GAHT would make them more prone to COVID-19 infection. Sixty point two percent of subjects ( $n = 65/108$ ) believed that the risk of death from COVID-19 infection was medium, whereas 20.4% ( $n = 22/108$ ) believed that it was low and 19.4% ( $n = 21/108$ ) believed that there was high risk.

In the majority of cases respondents confirmed the availability of telemedicine for endocrinological care (76.8%) and mental health support (64%). In 41.7% of participants Information regarding the possibility of access to telemedicine was obtained from the transgender association Movimento Identità Trans *onlus*, from the endocrinologist in 22.2% of subjects and from friends or social media for the remainder. On a scale of zero to 10 satisfaction with the telemedicine service was generally high:  $8.2 \pm 2.6$  for the endocrinological visit and  $8.0 \pm 2.4$  for the psychological visit.

### Mental Health and Quality of Life Questionnaires

The mean total IES score was  $21.1 \pm 14.9$  with 24.1% of subjects ( $n = 26/108$ ) scoring over the cut-off score of 26 thus

$\geq 26$  suggesting a moderate-to-severe impact of the pandemic event.

Mean BDI score was  $8.6 \pm 8.4$ , with 73 subjects scoring less than 10 thereby presenting minimal or no depression, 22 participants scoring 10 to 18 indicating mild to moderate depression, nine with scores indicating moderate to severe depression (from 19 to 29) and four with severe depression.

The SF-12 total mean score was  $96.1 \pm 11.9$  with a Physical Component Summary score of  $53.2 \pm 7.6$  (analogous to the Italian general population of similar age, 18 to 44 years,  $52.7 \pm 6.0$ )<sup>21</sup> and a Mental Component Summary score of  $42.8 \pm 9.1$  (worse than the Italian general population of similar age,  $48.2 \pm 9.8$ ).<sup>21</sup>

### Analysis of Factors Potentially Influencing Psychological Endpoints

Correlation between socio-demographic, medical and trans-related characteristics and psychological endpoints were evaluated. The results of the multivariate linear regression analysis are presented in Table 2. The possibility of access to an endocrinological consultation for hormonal prescription through telemedicine services was associated with lower IES total scores ( $P = .01$ ). Higher IES scores were associated with increasing fear of contracting the infection ( $P = .0376$ ). Male assigned gender at birth was associated with higher BDI scores ( $P = .01$ ).

## DISCUSSION

In this study we assessed the impact of the COVID-19 outbreak on some mental health aspects and wellbeing of a selected sample of transmen and transwomen attending a LGBT association in northern Italy via a web-based survey. We also analyzed whether access to telemedicine during the COVID-19 lockdown was associated or not to a reduction of the distress of these subjects in the context of a pandemic.

The majority of the 108 respondents included in the analysis were transmen who were living predominantly in Northern Italy, where the COVID-19 situation was worst during the pandemic. The vast majority of participants were in good health and using hormones. In our cohort only four (3.7%) subjects reported to having tested positive for COVID-19.

In regard to economic status, we confirmed that this population is economically weaker than the general Italian population with a far lower annual income, especially true for transwomen. Over half of respondents did not work during the COVID-19 outbreak mainly because they lost their job due to the lockdown (37.0%). Therefore, the overall unemployment rate in our cohort during the COVID-19 pandemic increased from 25.0% to 55.6% (+ 30.6%). This rate and its increase are significantly higher in comparison to the general Italian population (unemployment rate at May 2020, 7.8%, + 1.2% in the first three months of 2020<sup>23</sup>). However, it should be noted that in our cohort unemployment rates before the COVID-19 outbreak

**Table 2.** Linear regression analysis to identify factors associated psychological scores

Dependent variable	Variables	B	Standard Error	95% CI	P value
<b>PCS score</b>					
	Assigned sex at birth	-2.466	2.307	-7.087 to 2.154	0.2896
	Age	-0.09455	0.1129	-0.3207 to 0.1316	0.458
	Mean income	-0.3014	1.338	-2.981 to 2.378	0.8225
	Fear of COVID-19	-0.1756	0.4139	-1.005 to 0.6537	0.6731
	Hours spent outside	0.2519	0.2485	-0.2460 to 0.7497	0.3152
	Endocrine telemedicine	-0.5975	3.015	-6.637 to 5.442	0.8436
	Mental health telemedicine	-4.665	2.647	-9.967 to 0.6375	0.0835
<b>MCS score</b>					
	Assigned sex at birth	-0.4551	2.727	-5.918 to 5.008	0.8681
	Age	-0.09036	0.1335	-0.3577 to 0.1770	0.5012
	Mean income	2.740	1.581	-0.4284 to 5.908	0.0887
	Fear of COVID-19	-0.6716	0.4894	-1.652 to 0.3089	0.1755
	Hours spent outside	-0.5223	0.2938	-1.111 to 0.06636	0.0809
	Endocrine telemedicine	-6.090	3.565	-13.23 to 1.051	0.0931
	Mental health telemedicine	-2.051	3.130	-8.320 to 4.219	0.5150
<b>IES score</b>					
	Assigned sex at birth	1.440	4.463	-7.504 to 10.38	0.748
	Age	-0.1758	0.2041	-0.5847 to 0.2332	0.3927
	Mean income	4.621	2.464	-0.3055 to 9.547	0.0655
	Fear of COVID-19	1.312	0.6220	0.07662 to 2.547	0.0376
	Hours spent outside	-0.6778	0.4755	-1.631 to 0.2751	0.1597
	Endocrine telemedicine	-11.06	4.305	-19.67 to 2.455	0.0126
	Mental health telemedicine	1.410	4.764	-8.137 to 10.96	0.7684
<b>BDI score</b>					
	Assigned sex at birth	7.784	3.069	1.625 to 13.94	0.0142
	Age	-0.03283	0.1494	-0.3326 to 0.2670	0.8269
	Mean income	-0.2038	1.745	-3.706 to 3.298	0.9075
	Fear of COVID-19	-0.1977	0.5658	-1.333 to 0.9376	0.7282
	Hours spent outside	0.1185	0.3317	-0.5472 to 0.7842	0.7224
	Endocrine telemedicine	-5.798	4.024	-13.87 to 2.278	0.1557
	Mental health telemedicine	3.374	3.544	-3.738 to 10.49	0.3455

Performed test: multiple linear regression with Bonferroni correction.

were similar to those previously reported in an Italian transwomen population (20%)<sup>24</sup> but higher if compared with an Italian transmen cohort (8%),<sup>25</sup> and for this reason these results may not be representative of the whole Italian transgender population.

Subjects were very worried that the lockdown would render access to hormonal treatment difficult or impossible. Indeed it should be considered that deprivation of treatment can result in several negative effects such as the increase in self-medication of hormones in the short term, but also the increase of depression and suicidal behavior not only in those waiting for the start of treatment but also in those already using hormones.<sup>26,27</sup>

The MIT *onlus* (Bologna) provided support for the use of telemedicine services for both endocrine consultations including GAHT prescriptions and monitoring together with mental health care. These services were advertised via mailing lists and

social media in order to reach the major part of the subjects in need. For this reason there is a high prevalence of telemedicine use (76.8% for endocrinological consults and 64% for psychological consults, using video calls, phone calls and e-mails) in our cohort although this situation does not represent the entire Italian trans population.

One in four subjects in our cohort presented a moderate to severe impact of the pandemic (IES score  $\geq 26$ ) and, considering the whole population, the mean total IES score was  $21.1 \pm 14.9$ . A comparison with the general Italian population during Covid-19 outbreak using the same test is not possible as the recent literature use a revised version (IES-R) with variable proportions of subjects with IES-R total score over the cut off ( $13.9 - 29.4$ ).<sup>28,29</sup> However the same test (IES) was used by Zhang et al in 263 residents of the Liaoning Province in China between January and February 2020 during the COVID-19

outbreak. Zhang reported lower IES scores with mean values of  $13.6 \pm 7.7$  and with only 7.6% with a score  $\geq 26$ .<sup>30</sup> Even though that population is different from certain aspects (eg culture and because COVID-19 diffusion was not considered so severe during the period of the Chinese study), it can be hypothesized that these different results are related to the condition of the transgender population. In fact, in the Chinese study and in similar studies conducted during the SARS epidemic,<sup>31</sup> the low psychological impact of the event was believed to be due to increased family and social support whereas the trans-population seems to be characterized by less social support and by marginalization. In the transgender population the overall distress caused by the fear of infection and by social distancing was potentially exacerbated by the worry caused by difficulties in access to hormonal treatments but also potentially by the need to postpone surgery<sup>9,32</sup> and the inability to continue their occasional work in order to have access to sufficient income.

In regard to depression scores, 12% of participants presented moderate to severe depressive symptoms and 18.5% mild to moderate depression. Transwomen presented worse depression scores than transmen.

The Physical Component Summary score was similar to the general Italian population, while Mental Component Summary score of SF-12 scored lower than the general population of similar age ( $42.8 \pm 9.1$  vs  $48.2 \pm 9.8$ ).<sup>21</sup> Even though we have no previous data in the Italian trans-population, nor in the general Italian population during the COVID-19 outbreak, a comparison can be performed with the SF-12 scores previously collected in a Spanish study involving 30 transwomen before COVID-19.<sup>33</sup> In that cohort, the physical domain score was similar to our population ( $54.37 \pm 4.41$ ) while the mental domain scored better ( $48.63 \pm 9.84$ ) suggesting a lower impact of the pandemic on mental health. During the COVID-19 pandemic in China, Zhang et al<sup>34</sup> reported better mental health scores ( $48.74 \pm 9.30$ ) in the general Chinese population.

In our cohort, telemedicine services for both endocrinological and psychological consultations were greatly welcomed. Furthermore, the availability of telemedicine consults for endocrinological evaluation and hormonal prescription was associated with lower impact of the pandemic event on mental health (better IES total scores). To our knowledge, ours is the first study to investigate the role of telemedicine for hormonal prescription and its potential impact on mental health during the COVID-19 pandemic outbreak in the trans-population. Studies conducted during the SARS outbreak and initial studies during the COVID-19 outbreak mainly in China, reported that people showed fear of infection and of dying and psychological distress with higher risk of depression and self-blame.<sup>30,35</sup> In a large scale nationwide Chinese survey Qiu et al demonstrated that quarantine and isolation triggered several psychological problems, such as panic disorder, anxiety and depression in particular in those more

vulnerable groups such as the young, the elderly, women and migrant workers.<sup>36</sup>

During physical distancing and lockdown, the Internet and social media are generally useful in reducing isolation,<sup>37</sup> and in this population they may have been important for keeping in touch with transgender associations and healthcare facilities. In our study we also demonstrated that the effect of telemedicine for access to endocrinological care for these subjects was associated to an improvement in mental health. It is well known that telepsychiatry during the pandemic played a relevant role as telemedicine has been the only tool available to deliver mental health support.<sup>38–40</sup> Even if it is not possible to define a certain causal relation, in the transgender population the opportunity to access hormonal treatment using a telemedicine service for the endocrinological consult may have relieved the distress caused by the pandemic.

This study presents some limitations: internet-based surveys have specific limitations because they can only select a certain group of people and because of the self-reporting bias. Those who responded to our survey were mainly from northern Italy where COVID-19 has had a greater impact. The disproportion between transmen and transwomen is certainly another limitation of the study as the 73.1% of respondents were transmale. For these reasons this is clearly a select population, however it should be considered that the MIT *onlus* is one of the largest LGBT associations in Italy.

Certainly it should be also acknowledged that our population may not be representative of the general Italian trans-population because of some characteristics. Our cohort presents a very good health, with only 10.1% of participants reporting at least one chronic disease. This can be a consequence of the young age of enrolled subjects ( $34.3 \pm 11.7$  years), however in a slightly older Italian cisgender adult population (35–50 years) the prevalence of subjects reporting at least one pathology was higher (27.1%).<sup>41</sup> The high rate of smokers is another characteristic that can make our cohort different from the general population (in Italy 19.9% of adults are smokers),<sup>42</sup> however it should be considered that the higher risk of tobacco use has already been reported in the transgender population also in other countries.<sup>43</sup>

## CONCLUSIONS

The preliminary results of this study highlight the impact of the pandemic on the mental health of the transgender population and how the use of telemedicine services may be associated to a mitigation of negative psychological effects. For the future, closer attention should be paid to vulnerable groups such the transgender population and access to health services especially for endocrine and mental health care should be improved. A nationwide plan for the extended use of telemedicine should be established with targeted intervention to reduce psychological distress.

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## STATEMENT OF AUTHORSHIP

G.G, A.D.P, M.C.M. conceived and performed the investigation, wrote the manuscript. G.G., A.S, I.M. performed the investigation and data curation. G.G., A.F., R.S. and M.C.M. reviewed and edited the manuscript, supervised the work, provided expertise and feedback.

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