



## Article

# Fertility Preservation and Parenthood: Perspectives of Trans and Non-Binary Youth and Parents in Portugal

Jorge Gato \* and Maria Fonseca

Faculty of Psychology and Education Sciences, University of Porto, 4200-135 Porto, Portugal

\* Correspondence: jorgegato@fpce.up.pt

**Abstract:** (1) Background: Fertility preservation allows for trans and non-binary individuals to achieve parenthood using their own gametes. Considering that preservation of gametes can be performed at increasingly earlier ages, it is important to analyze both the attitudes of trans and non-binary youth and their parents towards available family formation options, including fertility preservation. We aimed to explore attitudes toward parenthood and fertility among trans and non-binary youth and parents of trans and non-binary youth. (2) Methods: A questionnaire about fertility attitudes was administered to 33 adolescents and young adults and 27 parents. (3) Results: Trans and non-binary youth showed little interest in resorting to fertility preservation, and both parents and youth mentioned the lack of knowledge about this procedure as the main reason for not performing it. Parents were overall supportive of their children's decisions, including the choice of different pathways to parenthood other than biological reproduction. (4) Discussion: Health providers should ensure that young trans and non-binary persons and their parents are aware of family formation options, including fertility preservation along with its impact in future genetic parenthood.

**Keywords:** trans; non-binary; youth; parents; attitudes; parenthood; fertility preservation



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## 1. Introduction

Many trans and non-binary (TNB) individuals have children (Stotzer et al. 2014), and for a considerable number, parenthood is in their future wishes and plans (e.g., De Sutter et al. 2002; Gato et al. 2021; Marinho et al. 2020; Riggs et al. 2016; Tasker and Gato 2020; Tornello and Bos 2017; von Doussa et al. 2015; Wierckx et al. 2012a, 2012b). However, these individuals' family formation options are conditioned by social and biomedical challenges. First, parenthood is still considered a prerogative of cisgender individuals and negative attitudes towards parenthood among TNB individuals are prevalent (Gato et al. 2021). In fact, cisheteronormativity, that is to say, the reinforcement of the beliefs and practices within social institutions and policies that legitimize and privilege heterosexuality and the cisgender identity (Warner 1991), has kept sexual and gender minority individuals in a disadvantaged vulnerable position also regarding their family formation plans (Gato et al. 2021). Second, available gender-affirming procedures can have a permanent impact on fertility and, consequently, on genetic parenthood options (Dickey et al. 2016). Historically, when seeking gender-affirming medical interventions, many TNB people accepted the potential loss of genetic parenthood as a price to pay for the sex-reassignment process (Chen et al. 2018; De Sutter 2001; Kyweluk et al. 2018). However, advances in fertility preservation (FP) techniques now allow TNB youth and adults to consider the option of genetic parenthood (Chen et al. 2018). Considering that FP procedures can be performed at increasingly earlier ages, it is important to consider the attitudes of both TNB youth and their parents regarding family formation and FP options.

### 1.1. Family Formation Options for TNB Individuals

Family formation options for TNB individuals comprise adoption/fostering and genetic parenthood (Marinho et al. 2020; Nahata et al. 2017; Tornello and Bos 2017; von

[Doussa et al. 2015](#)). The latter pathway can be achieved via sexual intercourse, donated gametes to a partner or surrogate, or FP of own gametes. Although a clear picture of predilection for genetic parenthood or adoption have yet to emerge, studies to date have indicated that preference rates do differ in different groups. For instance, [Tornello and Bos \(2017\)](#) found that trans men more often expressed a preference for parenthood through sexual intercourse or pregnancy whereas trans women were more inclined to seek adoption. In the exploratory survey by [Riggs et al. \(2016\)](#), over half their sample of Australian TNB people wanted to pursue genetic parenthood (mostly through their partner giving birth) while the remainder planned to explore long-term foster care or adoption. A similar picture emerged in the study of [Marinho et al. \(2020\)](#) with half of the 14 interviewed TNB participants wanting to be parents through adoption.

Fertility preservation integrates a range of procedures, whose primary objective is to preserve the reproductive material of individuals who may face infertility problems ([Strang et al. 2017](#)). In practical terms, these procedures involve the collection and cryopreservation of gametes (oocytes and sperm). Cryopreservation of sperm is a possible option for trans women who undergo gender affirming medical treatments ([De Sutter 2009](#)). Choices available to trans men who wish to preserve genetic material include cryopreservation of ovarian tissue or more established techniques involving oocyte or embryo storage ([James-Abra et al. 2015](#)). However, if hormone therapy has already been initiated, it is necessary to temporarily interrupt it to stabilize the levels of certain hormones that enable the production of new viable gametes for cryopreservation ([Tornello and Bos 2017](#)). Additionally, if hormone therapy is already at an advanced stage, FP may be compromised ([Tornello and Bos 2017](#)). Still, the long-term effects of hormone therapy are unknown, and a possible impact on fertility is suspected ([Persky et al. 2020](#); [Riggs and Bartholomaeus 2019](#)), making a follow-up by health professionals imperative to ensure informed consent on all benefits and harm of each procedure ([Auer et al. 2018](#); [Persky et al. 2020](#)).

Regarding TNB individuals' attitudes toward FP, approximately one third of the trans men surveyed by [Wierckx et al. \(2012b\)](#) said they would have considered cryopreserving gametes had techniques been available previously and, in an earlier study, over three quarters of trans women thought that sperm freezing should be routinely offered before hormonal treatment ([De Sutter et al. 2002](#)). However, only half of the participants in De Sutter et al.'s (2002) study indicated that they would have actually preserved their own gametes had this been possible, a finding echoed in recent studies ([Auer et al. 2018](#); [Marinho et al. 2020](#); [Riggs and Bartholomaeus 2018](#)).

Trans and non-binary individuals often perceive FP procedures as disrupting their gender identity, as participation in them involves thinking about or discussing sex and gender associated internal or external anatomy (including pregnancy) and interrupts gender affirming treatments (e.g., testosterone usage) that they would rather not delay ([Armuañ et al. 2017](#); [Chen et al. 2017](#); [Marinho et al. 2020](#); [Nahata et al. 2017](#); [Petit et al. 2018](#); [Riggs and Bartholomaeus 2018](#); [Riggs et al. 2016](#); [Tasker and Gato 2020](#); [Tornello and Bos 2017](#); [von Doussa et al. 2015](#)). In addition to these problems, FP carries high financial costs that make it inaccessible to many people ([Chen and Simons 2018](#)). Finally, the lack of preparation of available services is also noteworthy, with some studies showing that a considerable proportion of TNB people have not had the opportunity or encouragement to speak to a health professional about existing options regarding fertility before starting hormone therapy ([Hafford-Letchfield et al. 2019](#); [Riggs et al. 2016](#)). These results are in line with those found by Marinho and colleagues (2020): although all TNB participants in this study ( $N = 14$ ) said they were adequately informed regarding the possible impact of gender-affirming procedures on fertility, only four of them had received specific information regarding FP.

### 1.2. Fertility Preservation among TNB Youth

Low rates of FP use among young TNB people have been observed, even when they had received specific counseling on these procedures (Bartholomaeus and Riggs 2020; Chen and Simons 2018; Marinho et al. 2020; Nahata et al. 2017; Persky et al. 2020; Strang et al. 2017). However, Nahata et al. (2017) called attention to the fact that some TNB youth may change their perspectives regarding genetic parenthood at later moments in their lives, namely after the gender affirmation process (Nahata et al. 2017). Therefore, the provision of follow-up care to this population becomes essential. According to Chen and Simons (2018), an assessment of the young person's maturity and existence of emotional difficulties that may interfere with their decision-making ability must be ensured, as well as a weighing up of the benefits and harms of FP, based on the young person's values, identity, and comfort.

In this sense, health professionals and the parents of these individuals play a relevant role when it comes to addressing the issue of FP among TNB youth. Still, Riggs and Bartholomaeus (2019) point to the danger of a pro-natalist logic, i.e., the preconceived idea that all people should want to reproduce, especially those who can have children. In the context of FP, this tendency can be present when health professionals strongly encourage TNB youth to perform FP, assuming that reproduction is an ultimate human goal (Riggs and Bartholomaeus 2019). Marinho et al. (2020) also highlighted that, although some TNB youth do not receive information regarding FP and its implications, others point to the excess of information that is presented, arguing that health professionals should only provide detailed information to young people who express interest in performing this procedure.

Parenthood desires and intentions tend to increase with age among trans people (Auer et al. 2018; Gato et al. 2021; Strang et al. 2017; Tasker and Gato 2020). For this reason, older TNB youth are likely to express more desire/interest in parenthood than their younger peers. Although it is important to distinguish between TNB youth, little is still known about the experiences and needs of non-binary people when it comes to their parenthood aspirations (Clark et al. 2018; Riggs and Bartholomaeus 2018; Tasker and Gato 2020). Non-binary individuals may have health needs that are different from people with a binary gender, including trans individuals (Clark et al. 2018). For instance, non-binary people and especially non-binary youth seem to have a higher incidence of mental health disorders when compared to trans youth and report more barriers in accessing gender affirmative healthcare (Clark et al. 2018; Riggs and Bartholomaeus 2018). Specifically regarding gender-affirming procedures, Clark et al. (2018) found that non-binary people tend to perform the same procedures as trans people but in smaller numbers. Furthermore, non-binary youth do not resort to hormone therapy as much as trans youth but report more impairments, such as refusal to treatment when this treatment is required (Clark et al. 2018; Tasker and Gato 2020), and they are also less likely to receive counseling before making decisions regarding FP (Clark et al. 2018; Riggs and Bartholomaeus 2018).

### 1.3. The Role of Parents in Their Children's Parenthood Decisions

Parents' perspectives on their children's fertility are also known to impact their decisions, which can either result in supporting their children's parental choices and wishes or encouraging—implicitly or explicitly—the completion of FP (Chiniara et al. 2019). Strang et al. (2017) found that, overall, parents displayed similar attitudes to their children regarding fertility and FP and did not emphasize the importance of genetic parenthood. Still, more than half of the parents in this study expected their child to consider FP. The role of parents may in this process may be especially important in a culture such as the Portuguese one, where family tends to play a central role in individual's lives (Hofstede 2011; Leal et al. 2019). Furthermore, constrained employment prospects of young adults alongside other economic hardships (Oliveira et al. 2014), also concur to the high average age of leaving parental home in this country (29 years) and a higher dependence on parents (Eurostat 2022).

#### 1.4. The Current Research

Trans and non-binary people remain an invisible population within the sociopsychological research on LGBTQ+ issues (Salvati and Koc 2022), and more so within the field of queer families (van Eeden-Moorefield 2018) and prospective parenthood processes among sexual and gender minority individuals (Gato et al. 2021). For these reasons, this exploratory study aimed to investigate differences in attitudes toward parenthood and FP among TNB youth and parents of TNB youth in Portugal. Furthermore, associations with age and gender identity (trans vs. non-binary) were also explored among youth.

## 2. Materials and Methods

### 2.1. Participants

The TNB youth sample consisted of 33 people, aged between 13 and 30 years ( $M = 21.24$ ;  $SD = 4.45$ ). As can be seen in Table 1, the majority were assigned female at birth, identified as trans men, and pansexuality was the predominant sexual orientation. All participants were of Portuguese nationality, and approximately half were in a committed relationship. Most were students, had completed Secondary Education, and did not consider themselves to be religious. Regarding the parents of TNB youth, the sample consisted of 27 parents, aged between 38 and 64 years ( $M = 49.0$ ;  $SD = 5.64$ ). As shown in Table 1, almost all participants were of Portuguese nationality and regarding the relationship with their child, slightly more than half were mothers. Slightly more than half considered themselves to be religious and most participants were married or living in cohabitation, had completed Secondary Education, and worked full time.

**Table 1.** Sociodemographic characteristics of the participants.

Variable	Youth ( <i>n</i> = 33)		Parents ( <i>n</i> = 27)	
	<i>n</i>	%	<i>n</i>	%
Sex assigned at birth				
Female	22	66.7%	15	55.6%
Male	11	33.3%	12	44.4%
Gender identity				
Cis woman	–	–	15	55.6%
Cis man	–	–	12	44.4%
Trans woman/Male to Female	5	15.2%	–	–
Trans man/Female to Male	16	48.5%	–	–
Non-binary/Gender queer	12	36.4%	–	–
Sexual identity				
Heterosexual	7	21.2%	27	100%
Lesbian	1	3.0%	–	–
Gay	1	3.0%	–	–
Bisexual	8	24.2%	–	–
Pansexual	11	33.3%	–	–
Queer	5	15.2%	–	–
Nationality				
Portuguese	33	100.0%	25	92.6%
German	–	–	1	3.7%
Dual	–	–	1	3.7%
Religiousness				
Yes	1	3.0%	14	51.9%
No	32	97.0%	13	48.1%

Table 1. Cont.

Variable	Youth ( <i>n</i> = 33)		Parents ( <i>n</i> = 27)	
	<i>n</i>	%	<i>n</i>	%
In a committed relationship <sup>1</sup>				
Yes	15	45.5%		
No	18	54.5%		
Civil status <sup>1</sup>				
Married/Cohabiting			16	59.2%
Partner in separate households			1	3.7%
Divorced/Separated			7	25.9%
Single			3	11.1%
Educational level				
6th grade	3	9.1%	3	11.1%
9th grade	3	9.1%	4	14.8%
12th grade	14	42.4%	15	55.6%
Vocational training	4	12.1%	–	–
Bachelor’s degree	8	24.2%	4	14.8%
Master’s degree	1	3.0%	–	–
Ph.D.	–	–	1	3.7%
Work status				
Student	21	63.6%	–	–
Unemployed	2	6.1%	2	7.4%
Full-time employee	3	9.1%	24	88.9%
Part-time employee	–	–	1	3.7%
Student and worker	7	21.2%	–	–

Note. <sup>1</sup> Youth were asked whether they were in (a) committed relationships(s), and parents were asked about their civil status.

## 2.2. Procedure

Data were collected between November 2020 and April 2021, using two separate questionnaires for youth and parents of TNB youth. Given the sensitivity of the topic and the participation of individuals under 18 years old, a waiver for parental consent was obtained from the Ethics Committee of the host institution. As in the original study (Strang et al. 2017), we aimed to collect 51 dyads of parents and children, resorting to two different strategies. First, the collaboration of different institutions and organizations sensitive to the topic under study was requested, by sending an email explaining the goals of the study and by asking for its dissemination. A total of 28 complete questionnaires were collected online from TNB youth and 17 from parents. Second, 51 paper questionnaires were administered in a hospital institution in Porto, Portugal, in a consultation for trans individuals (21 in-person and 30 by mail). Sealed envelopes were distributed in the consultation setting and sent by mail. Each envelope contained three additional envelopes: one containing one questionnaire and two copies of the informed consent for the young person, and another two each containing one questionnaire and two copies of the informed consent for the parents (or other childcare providers). A letter addressed to the participants with information regarding the documents included in the envelopes as well as mailing instructions was also included. Of these 51 questionnaires (34 for parents and 17 for TNB youth), a total of 15 complete questionnaires were returned (10 from parents and 5 from TNB youth). In addition to these dissemination channels, the links to the questionnaires were also shared on several social media (Facebook, Instagram, Twitter, and LinkedIn).



The inclusion criteria for the study were explained in the informed consent sheets. In the case of TNB youth, they should be at least 13 years old and identify as a trans or non-binary person in terms of their gender identity. In the case of parents, they had to be parents of youth who identified as trans or non-binary people in terms of their gender identity. The objectives of the study, its instructions, the confidential and anonymous nature of the answers, as well as the voluntary nature of participation in the study were clarified, ensuring knowledge of these terms by signing the informed consent that preceded the questionnaire (in the case of the on-line version of the questionnaire, participants ticked the appropriate boxes to provide consent). The study was approved by the Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Porto (2020/10-6b).

### 2.3. Measures

#### 2.3.1. Sociodemographic Characteristics

Two sociodemographic questionnaires were devised for youth and parents. Questions common to the two instruments regarded age, sex assigned at birth, gender identity, sexual identity, nationality, religiosity, educational level, and current work status. Furthermore, in the parents' questionnaire, the relationship with the youngster was ascertained, as well as the current civil status. Youths were also asked if they were in a committed relationship. All questions and answer options can be consulted in Table 1.

#### 2.3.2. Attitudes toward Parenthood and Fertility Preservation

To assess this variable, we used the Trans Youth Fertility Attitudes Questionnaire (TYFAQ), developed by [Strang et al. \(2017\)](#) to investigate the attitudes toward parenthood and fertility of people involved in gender-affirming treatments. The instrument addresses knowledge about infertility risks, opinion about having biological children, and knowledge about FP procedures. The TYFAQ was designed to be a research tool for studies on parenthood and fertility attitudes of trans youth and as a clinical tool to facilitate dialogue between youth and parents with health professionals about these issues ([Strang et al. 2017](#)). The questionnaire is composed of 16 items and has two versions, one to be completed by the parents and one to be completed by the young person. According to the authors, each item is intended to measure an individual theme ([Strang et al. 2017](#)). Items 1 to 2 and 4 to 15 are rated using a Likert scale from 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). Items were averaged with higher scores indicating a higher level of agreement with item content. Most items have parallel themes between youth and parents, except for item five (Youth version: Existence of professionals to talk to about how to achieve biological parenthood, even if they are undergoing hormone therapy; Parent version: Desire to talk to professionals about how their child can achieve biological parenthood, even if they are undergoing hormone therapy). The TYFAQ was translated to Portuguese language by the second author of the study and discussed with the first author. Next, the translated version of the scale was presented to a mother and her young adult trans child. After their suggestions, minor semantic adjustments were made to facilitate the understanding of the items.

### 2.4. Data Analysis

Data were entered and analyzed using IBM SPSS Statistics 27 software. The assumption of normality of the items of the TYFAQ was tested using the Kolmogorov–Smirnov test with Lilliefors correlation, for both subsamples. As in the original study ([Strang et al. 2017](#)), differences in items were then explored between parents and youth; among TNB youth, differences were also explored as a function of age (adolescents aged between 13 and 19 years versus young adults aged between 20 and 30 years old) and gender identity (trans youth versus non-binary youth). For all these analyses, t-tests for independent samples were performed, except when inspecting differences as a function of youth's gender identity, in which t-test with Welch correction was used due to an imbalance in group composition. Cohen's *d* was calculated as a measure of effect size, and the standard values set by the author were applied: 0.20 small effect, 0.50 moderate effect,

and 0.80 large effect (Cohen 1988). In the comparison between parents of TNB youth and TNB youth, items 3, 5, and 16 were analyzed qualitatively. Items 3 and 16 correspond to items with response categories which are not mutually exclusive, so each participant could choose more than one option.

### 3. Results

For both samples, the assumption of normality as measured by the Kolmogorov–Smirnov test was violated for all TYFAQ items ( $p < 0.05$ ). However, as the asymmetry and kurtosis values were within the limits advised by Kline (2015) ( $|sk| < 3$ ;  $|ku| < 7-10$ ), parametric tests were used to analyze the data. Descriptive statistics (minimum value, maximum value, mean, standard deviation, significance of the Kolmogorov–Smirnov test, skewness, and kurtosis) were calculated for all items in both samples and are available in Appendices A and B.

Concerning the attitudes towards parenthood and fertility preservation of youth and parents, as shown in Table 2, statistically significant differences were only found for item 6 (*Desire to have children*), item 12 (*Family attitude toward biological parenthood*), and item 15 (*Family desire for gamete preservation*), with parents reporting more favorable attitudes than TNB youth.

**Table 2.** Differences in Attitudes Towards Parenthood and Fertility Preservation between TNB Youth and Parents of TNB Youth.

TYFAQ Items	Parents ( <i>n</i> = 27)		TNB Youth ( <i>n</i> = 33)		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
1. Importance of learning about the impact of HT on biological parenting	3.00	0.68	2.88	1.24	51.21	0.48	0.63	0.12
2. Awareness of the impact of HT on biological parenting	3.07	0.62	3.33	0.74	57.96	−1.49	0.14	0.38
4. Support from professionals to learn about the impact of HT on biological parenting	2.63	0.97	3.00	1.00	58	−1.45	0.15	0.38
6. Desire to have children	2.96	0.90	2.33	1.27	56.94	2.25	0.03	0.56
7. Importance of having biological children.	1.30	1.14	1.30	1.21	58	−0.02	0.98	0.01
8. Consideration of adoption	3.37	0.57	3.15	0.67	58	1.35	0.18	0.35
9. Change in feelings about biological parenting with age	2.63	0.93	2.52	1.09	58	0.43	0.67	0.11
10. Attitude toward concealing the effects of HT on biological parenting	2.48	1.05	2.39	1.22	58	0.29	0.77	0.08
11. Awareness about the existing options for having biological children, even if performing HT	2.70	0.67	2.91	0.95	58	−0.95	0.35	0.25
12. Family attitudes toward biological parenting	2.41	0.97	1.58	1.39	56.69	2.72	0.01	0.68
13. Family's feeling of disappointment at the impossibility of having biological children	1.00	1.04	1.55	1.23	58	−1.83	0.07	0.48
14. Consideration of FP	2.41	0.97	1.97	1.29	58	1.46	0.15	0.38
15. Family desire for gamete preservation	2.44	0.93	1.48	1.18	58	3.44	0.001	0.89

Note. FP = fertility preservation; HT = hormone therapy; TNB = trans and non-binary.

The analysis of items 3, 5, and 16 was based on the content of the participants' responses and their frequencies (Table 3). Regarding the way the person learnt that hormone therapy could hinder the process of having biological children (Item 3), while slightly more than half of the youth obtained information through a doctor, this percentage dropped to about 30% in the case of parents. The Internet was an information vehicle mentioned by most youngsters, whereas only about a quarter of the parents mentioned it. The percentage of TNB youth who obtained this information from peers (about 20%)

was very similar to the percentage of parents who obtained this information from other mothers and fathers.

Almost half of both the parents and youth agreed or strongly agreed that there is a professional with whom they feel they can or would like to talk to about what can be done to have biological children while undergoing hormone treatment. However, a higher percentage of parents answered that they did not know, when compared to youth. As far as the reasons preventing gamete preservation are concerned (Item 16), both youth and parents pointed to the lack of knowledge about the FP procedures as the main reason for this. The discomfort and embarrassment associated with the procedure was chosen by twice as more youths than parents. Finally, a considerable percentage of the parents selected the option “Other”, referring to other reasons such as (i) their child had already started hormone therapy, (ii) it was their child’s decision, (iii) their child did not want to undergo FP, (iv) there was nothing that prevented their child from undergoing FP, and (v) their child already had psychological counseling included in the FP process.

**Table 3.** Differences in Attitudes Towards Parenthood and Fertility Preservation between TNB Youth and Parents of TNB Youth (Items 3, 5, and 16).

Youth Items	Parents Items	Response options	TNB Youth ( <i>n</i> = 33) %	Parents ( <i>n</i> = 27) %
3. How the youth learned that HT could hinder the process of having biological children.	3. How the participant learned that HT could hinder the process of her or his child having biological children.	Doctor	54.50%	29.60%
		Internet	72.70%	25.90%
		Did not know	15.20%	11.10%
		Peers	21.20%	–
		Other Parents	–	22.60%
5. TNB youth feel there are professionals to talk to about what they can do to have biological children while undergoing HT.	5. Participants would like to talk to someone about what their child can do to have biological children while undergoing HT.	Other	–	25.90%
		Strongly Agree	33.30%	7.40%
		Agree	42.40%	40.70%
		I don’t know	9.10%	29.60%
		Disagree	15.20%	22.20%
16. Reasons preventing preservation of own gametes.	16. Reasons preventing the participant’s child from preserving their gametes.	Strongly Disagree	0.00%	0.00%
		Lack of information	39.40%	37.00%
		Cost of fertility preservation	15.20%	18.20%
		Delay of the transition process	18.20%	18.50%
		Discomfort and embarrassment associated with the procedure	33.30%	14.80%
		Other	27.30%	40.70%

Note. HT = hormone therapy; TNB = trans and non-binary.

Regarding the attitudes toward parenthood and FP of younger versus older TNB youth, as can be seen in Table 4, statistically significant differences were only found in item 1 (*Importance of learning about the impact of hormone therapy on biological parenthood*), with older participants scoring higher than their younger peers. Although marginally significant, the same tendency was observed regarding item 6 (*Desire to have children*).



**Table 4.** Differences in Attitudes Towards Parenthood and Fertility Preservation between Younger (13–19 years) and Older (20–30) TNB Youth.

TYFAQ Items	13–19 ( <i>n</i> = 15)		20–30 ( <i>n</i> = 18)		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
1. Importance of learning about the impact of HT on biological parenting	2.40	1.24	3.28	1.13	31	−2.13	0.04	0.74
2. Awareness of the impact of HT on biological parenting	3.07	0.88	3.56	0.51	21.52	−1.90	0.07	0.69
4. Support from professionals to learn about the impact of HT on biological parenting	3.07	1.03	2.94	1.00	31	0.35	0.73	0.12
5. Existence of professionals to talk to about accomplishing biological parenting, even performing HT	2.93	1.22	2.94	0.87	24.74	−0.03	0.98	0.01
6. Desire to have children	1.93	1.28	2.67	1.19	31	−1.71	0.10	0.60
7. Importance of having biological children	1.07	1.10	1.50	1.30	31	−1.02	0.31	0.36
8. Consideration of adoption	3.07	0.59	3.22	0.73	31	−0.66	0.51	0.23
9. Change in feelings about biological parenting with age	2.73	1.03	2.33	1.14	31	1.05	0.30	0.37
10. Attitude toward concealing the effects of HT on biological parenting	2.27	1.16	2.50	1.30	31	−0.54	0.59	0.19
11. Awareness about the existing options for having biological children, even if performing HT	2.80	0.94	3.00	0.97	31	−0.60	0.55	0.21
12. Family attitudes toward biological parenting	1.80	1.57	1.39	1.24	31	0.84	0.41	0.29
13. Family's feeling of disappointment at the impossibility of having biological children	1.67	1.45	1.44	1.04	31	0.51	0.61	0.18
14. Consideration of FP	1.73	1.16	2.17	1.38	31	−0.96	0.34	0.34
15. Family desire for gamete preservation	1.60	1.30	1.39	1.09	31	0.51	0.62	0.18

Note. FP = fertility preservation; HT = hormone therapy.

Concerning differences in attitudes toward parenthood and FP as a function of gender identity, as can be seen in Table 5, statistically significant differences were only found in item 4 (*Support from professionals to learn about the impact of hormone therapy on biological parenthood*) and item 5 (*Existence of professionals to talk to about accomplishing biological parenthood, even performing hormone therapy*), with trans participants scoring higher than their non-binary counterparts.

**Table 5.** Differences in Attitudes Towards Parenthood and Fertility Preservation between Transgender and Non-Binary Youth.

TYFAQ Items	Trans-Gender ( <i>n</i> = 21)		Non-Binary ( <i>n</i> = 12)		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
1. Importance of learning about the impact of HT on biological parenting.	2.76	1.26	3.08	1.24	31	−0.71	0.48	0.26
2. Awareness of the impact of HT on biological parenting.	3.43	0.75	3.17	0.72	31	0.98	0.33	0.36
4. Support from professionals to learn about the impact of HT on biological parenting.	3.33	0.73	2.42	1.17	16.05	2.46	0.03	10.01

Table 5. Cont.

TYFAQ Items	Trans-Gender ( <i>n</i> = 21)		Non-Binary ( <i>n</i> = 12)		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
5. Existence of professionals to talk to about accomplishing biological parenting, even performing HT.	3.29	0.85	2.33	1.07	31	2.82	0.01	10.02
6. Desire to have children.	2.43	1.29	2.17	1.27	31	0.57	0.58	0.21
7. Importance of having biological children.	1.29	1.10	1.33	1.44	31	−0.11	0.92	0.04
8. Consideration of adoption.	3.19	0.60	3.08	0.79	31	0.44	0.66	0.16
9. Change in feelings about biological parenting with age.	2.57	1.12	2.42	1.08	31	0.39	0.70	0.14
10. Attitude toward concealing the effects of HT on biological parenting.	2.29	1.19	2.58	1.31	31	−0.67	0.51	0.24
11. Awareness about the existing options for having biological children, even if performing HT.	3.05	0.74	2.67	1.23	31	1.12	0.27	0.40
12. Family attitudes toward biological parenting.	1.52	1.44	1.67	1.37	31	−0.28	0.78	0.10
13. Family's feeling of disappointment at the impossibility of having biological children.	1.48	1.29	1.67	1.16	31	−0.42	0.68	0.15
14. Consideration of FP.	1.81	1.29	2.25	1.29	31	−0.94	0.35	0.34
15. Family desire for gamete preservation.	1.43	1.29	1.58	1.00	31	−0.36	0.72	0.13

Note. FP = fertility preservation; HT = hormone therapy.

#### 4. Discussion

This study aimed to explore differences in attitudes toward parenthood and FP in TNB youth and parents of TNB youth. In addition, it intended to explore whether there were differences in these attitudes between TNB adolescents and young adults, and between trans and non-binary youth. Overall, although parents revealed a desire for their children to opt for biological parenthood, this pathway for parenthood was not considered to be important. Thus, parents were generally supportive of their children's decisions, including the choice of different pathways to parenthood (such as adoption) other than biologically conceiving a child. Furthermore, TNB youth showed little interest in performing FP and both parents and TNB youth mentioned that the main reason not to perform FP is the lack of knowledge on this procedure. Finally, the desire of TNB youth to have children appeared to increase with age and trans participants seemed to feel more supported and informed regarding fertility issues than non-binary participants.

In line with [Strang et al. \(2017\)](#), we found that both TNB youth and parents of TNB youth showed similar attitudes toward parenthood and FP. Even so, differences regarding the desire to have children and the family's attitude toward genetic parenthood were evident. Although TNB youth did not seem to feel pressured by their family to have biological children, this contrasted with the parents' response trend, which revealed a desire for their children to choose biological parenthood. We found that parents expressed a desire for their children to consider and choose FP as a pathway to parenthood, as evidenced by the mean scores obtained for items 14 and 15 (higher than the Likert scale mean value), in contrast with the lower mean scores obtained by TNB youth for the same items. These trends were, once again, in agreement with the results of [Strang et al. \(2017\)](#). However, despite the desire for genetic parenthood, this pathway was not considered to be important. This was evidenced by the mean scores obtained in item seven and in item 13, concerning the importance assigned to genetic parenthood and regarding the feeling of disappointment at the impossibility of having biological children, respectively, which are in line with the results found in the original study ([Strang et al. 2017](#)). Additionally, like the original study, both TNB youth and parents were keen on considering adoption as a way of having children. This way, despite existing barriers ([Marinho et al. 2020](#); [Tornello and](#)

Bos 2017), adoption appears to remain a pathway to parenthood considered by both TNB youth and parents of TNB youth.

Regarding the consideration of FP, the TNB youth showed little interest in this procedure, as found by Strang et al. (2017). In fact, FP seems to have low rates of use by trans youth who can perform it (Bartholomaeus and Riggs 2020; Chen and Simons 2018; Nahata et al. 2017; Persky et al. 2020; Strang et al. 2017). As several authors have shown, a major reason for not performing FP is the need to stop or delay hormone therapy for gamete preservation (Chen et al. 2018; Kyweluk et al. 2018; Marinho et al. 2020; Tornello and Bos 2017; von Doussa et al. 2015). Both the discontinuation of hormone therapy and the FP procedures themselves can lead to an accentuation of discomfort associated with the use of reproductive body parts and gametes that are not embodied in gender identity (Kyweluk et al. 2018; Murphy 2012), which not all TNB youth are able or willing to deal with. On the one hand, stopping hormone therapy can lead to the reappearance of certain sexual characters and functions; on the other hand, gamete preservation procedures force contact with a reproductive organ/system with which the person no longer identifies (Kyweluk et al. 2018; Murphy 2012; Tasker and Gato 2020).

The main reason why TNB youth do not perform gamete preservation is, for both parents and youth, the lack of knowledge about the FP process. These results are in line with those obtained by Marinho et al. (2020), in which out of a total of 14 trans people, only 4 received concrete information regarding fertility preservation, results similar to those of other studies (Auer et al. 2018; Riggs and Bartholomaeus 2019). The reasons both parents and TNB mentioned coincide with the ones reported in other studies, such as the cost of the procedures (Chen and Simons 2018), the discomfort and embarrassment associated with the procedure (Murphy 2012), not wanting to delay or interrupt the gender transition/affirmation process because of FP (Chen et al. 2018; Kyweluk et al. 2018; Marinho et al. 2020; Tornello and Bos 2017; von Doussa et al. 2015), and the lack of knowledge that FP is an option (Marinho et al. 2020; Riggs and Bartholomaeus 2018).

The present study also aimed to explore differences in attitudes toward parenthood and fertility between TNB adolescents and young adults. The two age subgroups showed similar results in almost all items of the TYFAQ, except for the fact that young adults considered it more important to learn about the impact of hormone therapy on biological parenthood than their adolescent counterparts. Although marginally significant, the same trend was observed regarding the desire to have children. From a developmental perspective, the desire to have children among trans people appears to increase with age (Auer et al. 2018; Tasker and Gato 2020), which may explain the higher parental desire and greater concern of older youth about the impact of certain procedures on biological parenthood. In addition, several authors mention that since gender-affirming procedures can be performed during adolescence, the parental desire may emerge later, at a stage when FP is no longer feasible, which highlights the importance of proper monitoring by professionals in terms of informing TNB youth about their future reproductive options (Bartholomaeus and Riggs 2020; Chen and Simons 2018; Nahata et al. 2017; Persky et al. 2020; Strang et al. 2017). Indeed, as noted by Dickey et al. (2016), becoming a parent may or may not be a natural part of a TNB person's life, concluding that these people's parenthood intentions as well as the selection of pathways to parenthood can be a complex process.

Finally, the attitudes of trans versus non-binary youth regarding attitudes toward parenthood and fertility were analyzed. Although the two subgroups agreed on most items of the TYFAQ, they differed in the perception of support from professionals with whom to talk about the impact of hormone therapy on genetic parenthood and in the existence of professionals with whom to talk about how to achieve genetic parenthood, even while undergoing hormone therapy. These results suggest that trans participants report feeling more supported and informed regarding these issues than their non-binary peers. While currently receiving increasing attention, the experiences and needs of non-binary people are still understudied (Clark et al. 2018; Riggs and Bartholomaeus 2018). Furthermore, these differences may be due in part to the barriers non-binary youth encounter in accessing

healthcare compared to trans youth (Clark et al. 2018). In fact, several studies point to the fact that non-binary youth are less likely to receive counseling before making decisions regarding the preservation of their gametes, when compared to trans youth (Clark et al. 2018; Riggs and Bartholomaeus 2018; Tasker and Gato 2020).

#### 4.1. Limitations and Future Directions

This study presents some limitations that should be considered in its interpretation. First, the initial objective of the study consisted of the comparative analysis of TNB youth and their own parents (aiming at 51 dyads), a relationship that was only guaranteed in five cases, corresponding to the questionnaires collected on paper. Thus, in future research, a collection of samples with more participants should be considered, where family bonds are ensured, to understand the impact that family perspectives may have on TNB youth and, consequently, in the choice of pathways to parenthood, namely, in the decision to undergo, or not, FP procedures. Second, following Strang et al.'s (2017) recommendation, we conducted analyses item by item. If on the one hand, this strategy enabled comparisons with the original work, on the other hand, it increased the chance of measurement error. This way, exploratory factor analyses could be run in the future to identify possible latent constructs. Third, the small number of non-binary participants is also a limitation. This is a relevant matter for future research since the experiences of non-binary people as well as their parental intentions and experiences in accessing health services are still understudied.

#### 4.2. Implications for Practice

Our results have implications for practice. The major reason given for not performing FP was the lack of knowledge about this procedure. These results are in line with the studies of Hafford-Letchfield et al. (2019) and Riggs et al. (2016), in which several TNB people did not have the opportunity or encouragement to speak to a health professional about the existing options regarding their fertility before starting hormone therapy. For this reason, it is essential to ensure that support from professionals effectively exists and is provided to guarantee that the choices made by young TNB people regarding FP and pathways to parenthood are well informed (Auer et al. 2018; Persky et al. 2020). Age differences among TNB youth should also be considered in counseling this population about family formation options, and it is necessary to ensure the correct transmission of information according to the age of each person. Another implication of this study relates to the specific challenges faced by non-binary youth. This gender identity should be seen as valid and health care services ought to be inclusive of youths outside the gender binary (Clark et al. 2018).

#### 4.3. Conclusions

Given the scarcity of literature on the topics analyzed, namely on what concerns TNB youth and their parents' attitudes towards FP and parenthood, this exploratory study was innovative and pioneering. For this reason, conversations between health professionals, TNB youth, and their families may be supported by our results, especially in a country where family plays such a central role in young adults' lives, such as Portugal (Eurostat 2022; Hofstede 2011; Leal et al. 2019; Oliveira et al. 2014).

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**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Porto (Ref<sup>a</sup> 2020/10-6c, 23.10.20).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study. Given the sensitivity of the topic, a waiver for parental consent was obtained for individuals under 18 years old whose parents did not participate in the study.

**Data Availability Statement:** The data presented in this study are available from the corresponding author upon request.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Descriptive Statistics of the TYFAQ items (Youth).

TYFAQ Items	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>	<i>p</i> <i>K.S.</i>
1. Importance of learning about the impact of HT on biological parenting.	2.88	1.24	0	4	−1.00	−0.00	<0.001
2. Awareness of the impact of HT on biological parenting.	3.33	0.74	2	4	−0.63	−0.85	<0.001
4. Support from professionals to learn about the impact of HT on biological parenting.	3.00	1.00	1	4	−0.80	−0.29	<0.001
5. Existence of professionals to talk to about accomplishing biological parenting, even performing HT.	2.94	1.03	1	4	−0.79	−0.38	<0.001
6. Desire to have children.	2.33	1.27	0	4	−0.48	−0.67	<0.001
7. Importance of having biological children.	1.30	1.21	0	4	0.61	−0.42	0.003
8. Consideration of adoption.	3.15	0.67	2	4	−0.18	−0.64	<0.001
9. Change in feelings about biological parenting with age.	2.52	1.09	0	4	−0.42	−0.61	<0.001
10. Attitude toward concealing the effects of HT on biological parenting.	2.39	1.22	0	4	−0.50	−0.62	<0.001
11. Awareness about the existing options for having biological children, even if performing HT.	2.91	0.95	0	4	−0.98	1.49	<0.001
12. Family attitudes toward biological parenting.	1.58	1.39	0	4	0.46	−1.10	<0.001
13. Family's feeling of disappointment at the impossibility of having biological children.	1.55	1.23	0	4	0.43	−0.89	<0.001
14. Consideration of FP.	1.97	1.29	0	4	0.06	−0.92	0.037
15. Family desire for gamete preservation.	1.48	1.18	0	4	0.53	−0.04	<0.001

*Note.* FP = fertility preservation; HT = hormone therapy.

## Appendix B

**Table A2.** Descriptive Statistics of the TYFAQ items (Parents).

TYFAQ Items	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>	<i>p</i> <i>K.S.</i>
1. Importance of learning about the impact of HT on my child's biological parenting.	3.00	0.68	1	4	−0.80	2.08	<0.001
2. Awareness of the impact of HT on my child's biological parenting.	3.07	0.62	1	4	−1.10	4.56	<0.001
4. Support from professionals to learn about the impact of HT on my child's biological parenting.	2.63	0.97	0	4	−1.09	1.09	<0.001
5. The desire to talk to someone about how my child can accomplish biological parenting, even performing HT.	2.33	0.92	1	4	−0.11	−0.90	<0.001

Table A2. Cont.

TYFAQ Items	M	SD	Min	Max	Sk	Ku	p K.S.
6. The desire for my child to have offspring.	2.96	0.90	1	4	−0.61	−0.16	<0.001
7. Importance of my child having biological children.	1.30	1.14	0	4	0.72	−0.25	<0.001
8. Consideration of adoption.	3.37	0.57	2	4	−0.14	−0.74	<0.001
9. Change in my child's feelings regarding biological parenting with age.	2.63	0.93	0	4	−1.04	1.48	<0.001
10. Attitude toward concealing the effects of HT on my child's biological parenting.	2.48	1.05	0	4	−0.91	0.70	<0.001
11. Awareness of the existing options for my child to be able to have biological children, even performing HT.	2.70	0.67	1	4	−0.41	0.53	<0.001
12. Family attitudes toward biological parenting.	2.41	0.97	0	4	−0.67	0.11	<0.001
13. Feeling of disappointment at the impossibility of my child having biological children.	1.00	1.04	0	3	0.89	−0.20	<0.001
14. Desire for my child to consider FP.	2.41	0.97	0	4	−0.67	0.11	<0.001
15. The desire for my child to perform gamete preservation.	2.44	0.93	0	4	−0.75	0.58	<0.001

Note. FP = fertility preservation; HT = hormone therapy.

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