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Transgender Men Who Experienced Pregnancy After Female-to-Male Gender Transitioning

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OBJECTIVE: To conduct a cross-sectional study of transgender men who had been pregnant and delivered after transitioning from female-to-male gender to help guide practice and further investigation.

MATERIALS AND METHODS: We administered a web-based survey from March to December 2013 to inquire about demographics, hormone use, fertility, pregnancy experience, and birth outcomes. Participants were not required to have been on hormone therapy to be eligible. We used a mixed-methods approach to evaluate the quantitative and qualitative data.

RESULTS: Forty-one self-described transgender men completed the survey. Before pregnancy, 61% (n=25) had used testosterone. Mean age at conception was 28 years with a standard deviation of 6.8 years. Eighty-eight percent of oocytes (n=36) came from participants' own ovaries. Half of the participants received prenatal care from a physician and 78% delivered in a hospital. Qualitative themes included low levels of health care provider awareness and knowledge about the unique needs of pregnant transgender men as well as a desire for resources to support transgender men through their pregnancy.

CONCLUSION: Transgender men are achieving pregnancy after having socially, medically, or both transitioned. Themes from this study can be used to develop transgender-appropriate services and interventions that

may improve the health and health care experiences of transgender men.

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Transgender individuals often report many barriers in attempting to access health care.¹ The American College of Obstetricians and Gynecologists (the College) recently called on obstetrician–gynecologists to help eliminate these barriers for transgender men (also called female-to-male individuals) by creating nondiscriminatory practices, assisting with gender transition, and providing transgender-appropriate and comprehensive health care.² Despite the College's call to action, little systematic attention has been paid to the health and reproductive experiences of transgender men or those individuals who are born with female sexual organs but who identify as male.

Transgender men are individuals who have a male or masculine gender identity but were assigned female at birth. The gender affirmation process may include social, medical, and surgical aspects of transition, although not all transgender men desire medical intervention.³ Many transgender men desire children⁴ and there are anecdotal reports supporting the biological possibility of pregnancy for transgender men who retain a uterus and discontinue testosterone therapy.^{5–7} However, there is little scientific literature describing pregnancy experiences among transgender men or the effects of exogenous administration of testosterone on fertility, pregnancy, and neonatal outcomes.⁸ Understanding transgender men's experiences with fertility, pregnancy, and birth will allow health care providers to augment pre- and posttransition discussions regarding fertility options, the roles of cross-sex hormones on fecundity, potential birth outcomes, and to support their physical and mental well-being during pregnancy. Expanded knowledge may also help

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health care providers support transgender men in attaining and maintaining healthy pregnancies.

We conducted a mixed-methods study to explore the experiences of transgender men and to contribute to the knowledge base of fertility, conception, pregnancy experience, and birth outcomes among transgender men.

MATERIALS AND METHODS

We conducted a cross-sectional survey from March to December 2013 of transgender men (assigned female at birth with a masculine, transmasculine, transmale, or female-to-male gender identity) who had been pregnant and delivered a neonate. Inclusion criteria were: age older than 18 years, self-identification as male before pregnancy, pregnancy within the last 10 years, and the ability to fill out the survey in English. Eligibility criteria did not require any type of medical (eg, testosterone use) or surgical (eg, bilateral mastectomy) transition. We recruited study participants through convenience sampling and we collected data using a web-based survey. Participation was not limited by geographic location.

We administered the online survey through REDCap,⁹ an encrypted and secure online survey platform. The study contained 47 multiple-choice questions and 24 questions addressing demographics, hormone use, fertility, pregnancy experience, birth experience, and fetal outcomes. The survey concluded with four open-ended questions: “Is there anything you would like medical providers to know about transgender men and pregnancy?” “What was the experience of being pregnant like for you?” “What was the experience of giving birth like for you?” “What was the postpartum experience like for you?” The survey was developed by the authors in consultation with the Center of Excellence for Transgender Health at University of California, San Francisco and other health care providers serving the transgender community.

Initial recruitment occurred through distribution to key stakeholders in lesbian, gay, bisexual, and transgender health centers; transgender community groups; and Internet-based social networking pages created by study authors. We recruited additional participants through initial contacts. We provided interested individuals with a comprehensive study description and links to the study. After accessing the electronic study web site, participants were presented with informed consent documents and participants confirmed their consent through accessing a link to web-based survey. No in-person contact was made with survey participants.

We conducted a mixed-methods analysis to evaluate the quantitative and qualitative data collected from the survey. Using STATA 13.0, we performed unadjusted analyses using χ^2 for method of delivery; *t* tests for pregnancy age, body mass index, and gestational age; and Fisher’s exact for all other variables according to testosterone use before pregnancy. As a result of nonresponse, variable totals may not sum to column totals or within category totals. A *P* value of $\leq .05$ was considered statistically significant. We analyzed the qualitative data using grounded theory, identifying iterative themes, and adding new codes as concepts emerged.¹⁰ This study was approved by the University of California, San Francisco Committee on Human Research.

RESULTS

We excluded nine of the 56 participants who began the survey as a result of insufficient responses for analysis, and six others were excluded because they did not meet study criteria indicating male gender before pregnancy.¹¹ We included participants who identified as female or preferred “she” or “her” pronouns only if they had more than one validating indicator of a transgender identity (use of testosterone, male identity with female pronouns, or female identity with male pronouns). Forty-one participants remained for final analysis (Table 1). Most of our participants were from the western United States, identified as white, and had completed at least some college. Pronoun preference differed between those who had used testosterone and those who had not ($P=.04$). Participants who had previously used testosterone were more likely to prefer the pronoun “he,” whereas those who had not used testosterone were more likely to identify with “they.” Although most respondents were primiparous, those who had not used testosterone were more likely to be multiparous ($P=.006$). Four transgender men (10%), all of whom had been on testosterone previously, reported a prior diagnosis of polycystic ovary syndrome.

Twenty-five (61%) transgender men reported using testosterone before pregnancy (Table 2). Among those who had used testosterone, 20 (80%) reported resuming menstruation within 6 months after stopping testosterone. Five participants (20%) conceived while still amenorrheic from testosterone use. After pregnancy, six (38%) participants who had not previously used testosterone before pregnancy initiated use. Ten participants (40%) who had been on previously testosterone reported that they had not yet resumed testosterone use after pregnancy.



Table 1. Participant Characteristics

Characteristic	All (N=41)	Prior Testosterone Use		P
		Yes (n=25)	No (n=16)	
Age (y)*	28±6.8	29±6.9	27±6.8	.5
Gender identity [†]				.07
Male	21 (51)	12 (48)	9 (56)	
Transgender, female-to-male, transman	10 (24)	9 (36)	1 (6)	
Bigender, gender fluid, genderqueer	8 (20)	3 (12)	5 (31)	
Female	1 (2)	1 (4)	0	
Other	1 (2)	0	1 (6)	
Personal pronoun preference [‡]				.04
He	32 (82)	21 (88)	11 (73)	
They	3 (8)	0	3 (20)	
She	2 (5)	2 (8)	0	
Ey	1 (2)	1 (4)	0	
No pronouns	1 (2)	0	1 (7)	
Country				.4
United States	35 (85)	20 (80)	15 (94)	
Outside United States [§]	6 (15)	5 (20)	1 (6)	
U.S. region [¶]				.9
West	19 (59)	11 (61)	8 (57)	
Northeast	5 (16)	3 (17)	2 (14)	
South	5 (16)	2 (11)	3 (21)	
Midwest	3 (9)	2 (11)	1 (7)	
Race or ethnicity [‡]				1.0
White	36 (92)	21 (88)	15 (100)	
Asian	1 (3)	1 (4)	0	
Asian and black	1 (3)	1 (4)	0	
Native Hawaiian or other Pacific Islander	1 (3)	1 (4)	0	
Education level [‡]				.7
High school degree or less	4 (10)	3 (12.5)	1 (7)	
Vocational training or some college	12 (31)	6 (25)	6 (40)	
Associate or Bachelor's degree	14 (36)	10 (42)	4 (27)	
Master's or doctoral degree	9 (23)	5 (21)	4 (27)	
Annual household income (\$)‡				.4
Less than 20,000	6 (15)	2 (8)	4 (25)	
20,000–59,999	20 (49)	12 (50)	8 (50)	
60,000–100,000	8 (20)	6 (25)	2 (13)	
More than 100,000	5 (13)	4 (17)	1 (7)	
Multiparous (2 or more pregnancies)	15 (37)	5 (20)	10 (63)	.006
Previous PCOS diagnosis	4 (10)	4 (16)	0	.15
BMI at the start of pregnancy (kg/m ²)	26±6	26±6	27±6	.6
Gender-confirming surgical procedure ^{¶¶}				.7
Bilateral mastectomy	19 (46)	13 (52)	6 (38)	
Oophorectomy	2 (5)	0	2 (13)	
Hysterectomy	2 (5)	2 (8)	0	
Phalloplasty or metoidioplasty [#]	1 (2)	1 (4)	0	

PCOS, polycystic ovary syndrome/BMI, body mass index.

Data are mean±standard deviation or n (%) unless otherwise specified.

* Age at the beginning of their most recent pregnancy.

† Kuper et al.²⁸

‡ Not all the participants answered this question.

§ Canada (n=2), Germany (n=1), England (n=1), Israel (n=1), and Switzerland (n=1).

|| Regions were defined according to the 2010 U.S. census.

¶ Surgery may have occurred before or after pregnancy.

Metoidioplasty is procedure that separates the clitoris from the labia to assume a physiologic position similar to a penis (Djordjevic et al²⁹).

Two thirds of pregnancies were planned (Table 3). Before the most recent pregnancy, condoms were the most common form of contraception followed by no

form of contraception and abstinence (defined as not engaging in penile–vaginal intercourse). Those who had previously used testosterone were more likely to



Table 2. Findings Among Those Who Used Testosterone Before Pregnancy of Report (n=25)

Characteristic	Value
Age (y) when testosterone was initiated	25 (17–35)
Length of testosterone use before pregnancy (y)	
Less than 1	10 (40)
1–2	6 (24)
3–10	4 (16)
More than 10	5 (20)
Stopped taking testosterone to become pregnant	17 (68)
Duration between stopping testosterone and resumption of menses (mo)	
No menses before pregnancy	5 (20)
Less than 1	2 (8)
1	6 (24)
2	7 (28)
3	4 (16)
4–6	1 (4)
Resumed or initiated testosterone after pregnancy*	20 (48)

Data are median (range) or n (%).

* Of total respondents in the study (N=41).

report no contraceptive use or abstinence, whereas those who had not used testosterone were more likely to use a hormonal contraceptive method ($P=.03$). The majority of oocytes came from the participants' own ovaries, whereas the majority of sperm came from a significant other or spouse. Most transgender men became pregnant within 4 months of trying, only 15% had a preconception medical consultation, and 7% used fertility drugs to become pregnant.

Pregnancy, delivery, and birth outcomes did not differ according to prior testosterone use (Table 4). Half of the participants received prenatal care from a physician, 40% from an obstetrician, and 10% from a family medicine physician. More than three fourths of the participants began taking prenatal vitamins either before pregnancy or within the first trimester, whereas 15% reported not taking any prenatal vitamins. Participants reported a variety of perinatal complications including hypertension (12%), preterm labor (10%), placental abruption (10%), and anemia (7%). Anemia was not reported by participants who had previously used testosterone. A higher proportion of transgender men who had used testosterone underwent cesarean delivery compared with those who reported no testosterone use (36% compared with 19%, respectively), although this finding was not statistically significant. Among those who underwent a cesarean delivery, 25% cited the indication as

elective. Those who had previously used testosterone were statistically less likely to chest (breast) feed their infant than those who had not previously used testosterone ($P=.04$).

Thirty participants (73%) answered at least one of the four open-ended questions. Major themes from these responses were: 1) effect of pregnancy on concepts of family structure; 2) isolation; 3) gender dysphoria and pregnancy; and 4) interactions with health care providers.

Many participants discussed their pregnancy in the context of family structure. For some, pregnancy was a necessary step in creating the family they desired: "I looked at it as something to endure to have a child" (36-year-old, prior testosterone use). Others described the pregnancy in pragmatic terms, possibly as a way to avoid gender dissonance: "Like my body was a workshop, building up this little kid" (35-year-old, prior testosterone use). Another participant found a way to embrace the pregnancy, describing the pregnancy and birth as a bridge to fatherhood: "Pregnancy and childbirth were very male experiences for me. When I birthed my children, I was born into fatherhood" (29-year-old, no prior testosterone use). Participants often used words such as "dad," "carrier," and "gestational parent" to affirm their male gender identity and describe their parenting role.

Feelings of isolation were common. One participant stated, "Pregnancy came with feelings of isolation and limitation" (28-year-old, prior testosterone use). Some identified the source of isolation as stemming from feeling "lonely because I was the only one" (30-year-old, prior testosterone use). These feelings were contextualized by comments about "lack of support" and "lack of resources available to pregnant transgender men." This isolation was also referenced in terms of invisibility: "I passed as 'not pregnant' until my eighth month, because I'm chubby anyways, and because people don't assume that someone who looks like me could be pregnant" (34-year-old, no prior testosterone use). As another participant simply put it: "We exist. And we are different" (35-year-old, prior testosterone use).

Another theme that emerged was the relationship between gender dysphoria and pregnancy. Some participants reported improvements in gender dysphoria, feeling new connections with their bodies: "It was relieving to feel comfortable in the body I'd been born with" (20-year-old, no prior testosterone use). Others felt an increase in dysphoria, and for some, that dysphoria continued into the postpartum period: "Heavy time, having a baby, not passing as male, all the changes and a society telling me to just be happy"



Table 3. Fertility Experiences Surrounding Most Recent Pregnancy by Prior Testosterone Use

Characteristic	Total (N=41)	Prior Testosterone Use		P
		Yes (n=25)	No (n=16)	
Planned pregnancy	28 (68)	19 (76)	9 (56)	.3
Contraception use before this pregnancy* [†]				.03
Condoms	16 (41)	10 (40)	6 (43)	
None	15 (38)	12 (48)	3 (21)	
Abstinence [‡]	3 (7)	3 (12)	0	
Fertility awareness	2 (8)	0	2 (14)	
Combined hormonal contraception (OCPs, transdermal patch, vaginal ring)	1 (3)	0	1 (7)	
Injection, intrauterine device, implant	1 (3)	0	1 (6)	
Partner had vasectomy	1 (3)	0	1 (6)	
Time to conception (mo) [†]				.14
Unplanned pregnancy	13 (32)	6 (24)	7 (44)	
Less than 1	3 (17)	1 (20)	2 (12)	
1–3	9 (22)	8 (32)	1 (6)	
4–6	8 (19)	5 (20)	3 (19)	
More than 7	4 (10)	1 (4)	3 (18)	
Source of oocyte				.12
Own ovaries	36 (88)	21 (84)	15 (94)	
Significant other or spouse	4 (10)	4 (16)	0	
Anonymous donor	1 (2)	0	1 (6)	
Source of sperm				.5
Significant other, spouse, or romantic partner	31 (76)	17 (68)	14 (88)	
Known donor	4 (10)	3 (12)	1 (6)	
Anonymous donor or sperm bank	6 (15)	5 (20)	1 (6)	
Medical intervention to become pregnant [§]				
Consultation	6 (15)	4 (16)	2 (12)	
Fertility drugs	3 (7)	2 (8)	1 (6)	
Assisted reproductive technology	5 (12)	5 (20)	0	

OCP, oral contraceptive pill.

Data are n (%) unless otherwise specified.

* Participants were given the option to identify with more than one, so total exceeds 100%.

[†] Not all the participants answered this question.

[‡] Defined as not having penile–vaginal intercourse.

[§] Participants could mark more than one, therefore not comparing the results statistically.

^{||} Includes artificial insemination, in vitro fertilization, and gamete intrafallopian transfer.

(35-year-old, prior testosterone use). Combined with feelings of isolation postpartum, many participants specifically mentioned having postpartum depression. “Began to show symptoms of postpartum depression long before anyone discussed symptoms to watch for... Began researching and working through postpartum depression issues independently; found no professional with familiarity with ‘trans/genderqueer’ gestational parents” (28-year-old, prior testosterone use). As mentioned, the depression seemed amplified by a lack of gender-sensitive resources for postpartum depression.

In response to queries interactions with health care providers, some participants mentioned positive interactions with their health care teams regarding their gender identity. “I was always called ‘he,’ I was always called ‘dad,’ and my body parts were called by

the words I used” (34-year-old, prior testosterone use). As previously, positive experiences often focused on proper use of gender-related language. Other participants mentioned negative experiences that ranged from improper pronoun use and rude treatment to being turned away from medical practices and denied treatment. In one extreme experience, a participant reported that “Child Protection Services was alerted to the fact a ‘tranny’ had a baby” (21-year-old, prior testosterone use). Many participants called for better treatment from the health care system through acknowledging the unique identities of pregnant transgender men and grounding health care provider–patient interactions in compassion and respect. As one participant said, “treat us as if we are normal human beings with normal bodies” (37-year-old, no prior testosterone use). Additionally, participants



Table 4. Pregnancy Experience and Neonatal Outcomes

Characteristic	Total (N=41)	Prior Testosterone Use		P
		Yes (n=25)	No (n=16)	
Source of prenatal care*				1.0
Obstetrician	16 (40)	9 (38)	7 (44)	
Certified nurse midwife	11 (28)	7 (29)	4 (25)	
Lay midwife	7 (18)	4 (17)	3 (19)	
Family practice doctor	4 (10)	3 (13)	1 (6)	
No prenatal care	2 (5)	1 (4)	1 (6)	
Perinatal complications [†]				
Hypertension	5 (12)	4 (16)	1 (6)	
Preterm labor	4 (10)	3 (12)	1 (6)	
Placental abruption	4 (10)	2 (8)	2 (12)	
Anemia	3 (7)	0	3 (19)	
Gestational diabetes	2 (5)	2 (8)	0	
Multiple pregnancy [‡]	2 (5)	2 (8)	0	
Postpartum infection	2 (5)	1 (4)	1 (6)	
Premature rupture of membranes	1 (2)	0	1 (6)	
Pyelonephritis	1 (2)	1 (4)	0	
Uterine rupture	1 (2)	1 (4)	0	
Substance use [§]				
Cigarettes	3 (7)	2 (8)	1 (6)	1.0
Alcohol	1 (2)	1 (4)	0	1.0
Recreational drugs	1 (2)	0	1 (6)	.6
Gestational age at delivery (wk±d)	38±6	37±9	39±5	.4
Location of birth				.6
Hospital	32 (78)	18 (72)	14 (88)	
Home	7 (17)	5 (20)	2 (13)	
Independent birth center	2 (5)	2 (8)	0	
Underwent labor induction	9 (22)	7 (28)	2 (12)	.3
Method of delivery				.5
Vaginal	29 (71)	16 (64)	13 (81)	
Cesarean	12 (30)	9 (36)	3 (19)	
Reason for cesarean delivery				.6
Previous cesarean delivery	1 (8)	1 (11)	0	
Breech presentation	1 (8)	1 (11)	0	
Placenta previa	1 (8)	1 (11)	0	
Arrest of labor	2 (17)	1 (11)	1 (33)	
Multiple pregnancy (twins)	1 (8)	1 (11)	0	
Requested cesarean delivery	3 (25)	3 (33)	0	
Other	3 (25)	1 (11)	2 (66)	
Birth weight (g) [¶]	3,146±1,671	2,914±1,276	3,490±625	.2
Neonate admitted to the NICU*	5 (14)	4 (20)	1 (7)	.4
Neonate diagnosed with an anomaly or developmental disorder [#]	3 (9)	1 (5)	2 (14)	.7
Neonate diagnosed with a disorder of sexual development ^{***}	2 (6)	1 (5)	1 (7)	.8
Chest (breast) fed	21 (51)	10 (40)	11 (69)	.04

NICU, neonatal intensive care unit.

Data are n (%) or mean±standard deviation unless otherwise specified.

* Not all the participants answered this question.

[†] Includes complications occurring in the preconception, antepartum, intrapartum, and postpartum periods.[‡] Both sets of multiples were twins.[§] Survey question stated: "Once you knew you were pregnant, did you regularly: _ drink alcohol, _ smoke cigarettes, _ use recreational drugs, _ none of the above."^{||} Other reasons for cesarean delivery: placental abruption (n=1), preeclampsia (n=1), none specified (n=1).[¶] N=42 neonates resulting from a set of twins.[#] Ventricular septal defect (n=1), bone cancer (n=1), sensory integration disorder (n=1).^{***} Intersex (n=1), micropenis (n=1).

noted that although their specific health care provider(s) may have been transgender-friendly, this was not necessarily the case with the office staff, nurses, and other health care workers.

DISCUSSION

The College has highlighted the need for obstetrician-gynecologists to help eliminate barriers to care for transgender men.² Our results demonstrate that transgender men desire children⁴ and are willing and able to conceive, carry a pregnancy, and give birth. Participants repeatedly expressed a desire for more information regarding fertility options and access to reproductive health care providers who respect, support, and understand their gender identity.

Studies suggest that amenorrhea commonly occurs within 6 months of initiating testosterone therapy.^{12,13} However, timeframe for resumption of menses after cessation of testosterone is unclear, and some have stated amenorrhea may be irreversible.¹⁴ Participants who discontinued testosterone to attempt pregnancy reported resumption of menses within 6 months, with the majority within 3 months. Some conceived before return of menses. Despite small sample size, the timeline for menses resumption is consistent with that of literature on women who became amenorrheic with Sertoli-Leydig tumors and resumed menses after tumor resection.¹⁵

Although most transgender men in this study received prenatal care from a physician and delivered in a hospital, participants used nonphysician providers and nonhospital birth locations more frequently than the general public. In 2009, 99% of U.S. births occurred in hospitals,¹⁶ compared with 78% of our participants. It is possible that health care provider choice and delivery location were responses to actual or anticipated negative experiences as suggested from many qualitative reports of suboptimal interactions with health care providers. However, health care provider and birth location may have resulted from other barriers such as access to health insurance.¹⁷⁻²⁰ Further research to clarify the experiences of transgender men with peripartum service provision will provide guidance for meeting their needs.

There is a 12% prevalence of major depressive disorders surrounding pregnancy, including postpartum depression, for women in the United States.²¹ Although we did not specifically ask about depressive disorders, many of our participants reported experiences with peripartum depression in the narrative responses. A Canadian study of mental health among transgender men (n=207) found that depression was

common.²² Our findings suggest that transgender men may represent a high-risk population for postpartum depression and, although further research is warranted, future recommendations should emphasize assessment of peripartum depression in this population.

Nearly half of the transgender men who had not used testosterone had an unplanned pregnancy, a proportion comparable to that of the U.S. population.²³ Comparatively, one fourth of those previously on testosterone had unplanned pregnancies. By design this study cannot speak to incidence or prevalence of unplanned pregnancies among transgender men. However, given the financial burden²⁴ and risk of increased morbidity²⁵ from unintended pregnancy as well as the contraindication of testosterone use during pregnancy,^{26,27} these findings suggest a potential unmet need for contraceptive services for transgender men.

Limitations to this study include those inherent with an online, cross-sectional survey, including not allowing for follow-up clarification from participants, decreasing responses from those with low literacy or other barriers to taking an online survey, and self-reported data raising concern for recall bias. The limited socioeconomic and racial diversity in respondents reduces immediate generalizability. Lastly, our eligibility criteria screened for transgender men who had a successful birth, impeding generalizable to those who attempt to get pregnant and cannot and those who do not carry to term. Strengths include the novelty of reporting transgender men's pregnancy experiences, inclusion of those who had socially and medically transitioned, and the mixed-methods format that allows insight into experiences.

Through demonstrating that transgender men are becoming pregnant and having babies, regardless of prior testosterone use, this preliminary study contributes data to emerging discussions regarding their reproductive health experiences. Respondents highlight the need for health care providers to partner with this community and develop gender-appropriate resources and support. Simple but meaningful steps for health care providers include establishing rapport by using patients' preferred names and pronouns, validating gender identity, and reflecting their individual relationships to their pregnancies. Counseling with transgender men should include discussions of reproductive goals, including fertility desires, and the role of contraception. We also suggest all health care providers discuss fertility preservation options with patients before initiating testosterone use in accordance with international standards of care.^{26,27} More



clinical and investigational work is needed to understand the physical and emotional needs of transgender men during pregnancy and birth so that health care providers may partner with this underserved community to improve care. As we respond to calls for increased access to reproductive health care for transgender men, we must ensure that we can provide evidence-based, comprehensive services befitting their unique needs and concerns.²

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