Social Media Engagement with Transgender Fertility Content

Running Title: Transgender Fertility on Social Media

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Abstract

Objective: To identify transgender fertility content with the highest online engagement on social media, determine the accuracy and quality of this content, and see how this has changed over a two-year period.

Design: BuzzSumo, a content research tool, was used to identify the top 10 article links related to transgender fertility most interacted with on the social media platforms of Facebook, Twitter, Pinterest, and Reddit. We compared article links from June 2019 – 2020 to June 2020 – 2021. Articles were categorized as accurate or misleading based on references cited and current research. Qualitative analysis was performed using article references to scientific literature and journal impact factors. User engagement was compared to accuracy of online information using descriptive and chi-square statistics.

Setting: Not applicable.

Patients: Not applicable.

Interventions: Not applicable.
Main Outcome Measures: Not applicable.

Results: The top 10 article links for each time period were examined, with 7,077 total engagements. Fourteen articles referenced 14 unique scientific studies; no references were available for the remaining 6 articles. Alternative media was the primary source of popular article links, and accurate articles accounted for 74% of total engagements. There was a significant association between the number of engagements with accurate articles and the time periods used for analysis (p < 0.0001).

Conclusions: As the popularity of social media continues to rise, patients are more likely to turn to online platforms in search of information and advice in regards to fertility. Transgender fertility is an emerging topic covered by scientific peer-reviewed journals, news organizations, and alternative media, and it is imperative for Internet users to consider the accuracy of information in findings presented by social media platforms. Further, reproductive endocrinology and infertility physicians should utilize social media platforms to educate their patients on the topic of transgender fertility and prevent the spread of misinformation.

Key words: transgender, LGBT, fertility, social media, Internet

Conflicts of interest: none

Introduction

The role of social media in patient access to online health information has expanded in recent years. Social media allows Internet users to educate themselves, learn about patient experiences, communicate with each other and with medical professionals, and lessen the stigma surrounding certain medical conditions (1).

Patients should be offered equal access to assisted reproduction and other fertility services regardless of gender identity status. Transgender individuals comprise a growing subgroup of the LGBT population seeking fertility care. The term transgender is used to describe a person whose gender identity is different from the sex assigned at birth, and it has been estimated that 0.6% of adults in the United States identify as transgender (2,3). There is a known lack of data for assisted reproduction and fertility preservation specific to transgender individuals, including the unknown long-term effects of exogenous hormone therapy for patients and their offspring (4,5). Although there are no detailed practice guidelines on fertility treatment for transgender patients, an ASRM Ethics Committee Opinion discusses important considerations in caring for this population (5). Some of our current methods in fertility preservation for transgender patients are based on approaches used for cancer patients (6).

Both ACOG and ASRM have published guidelines stating that providers should discuss fertility preservation options with their patients prior to gender transition, which may include hormone therapy and/or gender confirmation surgery (2,5). However, not all fertility centers provide services to transgender patients. Some centers may only provide services to certain populations
under a specific set of circumstances, such as FTM (female-to-male) transgender patients with a female partner who have already transitioned (7–9).

Transgender patients face many barriers to care, including discrimination and mistreatment, lack of information, financial burden, and emotional challenges (10). Prior studies have demonstrated that transgender patients are considerably less represented on fertility clinic websites compared to same sex couples (11,12). As a result, transgender patients may be more likely to turn to alternative online resources such as social media platforms in order to seek information about fertility treatment options.

Given the known prevalence of health misinformation on social media, we aimed to examine the accuracy of articles on transgender fertility content most frequently shared on social media using qualitative and quantitative analyses. Researchers have previously published data using the online analytics tool BuzzSumo, including studies on social media engagement for male infertility content and COVID-19 misinformation (13,14). We hypothesize that highly shared content on the topic of transgender fertility may not always be accurate or supported by scientific literature.

**Materials and Methods**

The social media analytics module BuzzSumo was used to identify the top 10 article links with the highest online engagement using the key words “transgender fertility”. BuzzSumo allows users to search for the most shared content on a specific topic or domain, and see how these shares are divided amongst the social media platforms of Facebook, Pinterest, Reddit, and Twitter. Facebook engagements are defined as the “sum of reactions, comments, and shares” and Reddit engagements include the “sum of upvotes and comments” (15). For Pinterest and Twitter, the total number of shares is used. This search was completed for the time periods of June 27, 2019 – June 26, 2020 and June 27, 2020 – June 26, 2021 for a two-year comparison. Search results were filtered by articles in the English language, and all of the articles selected were found to be related to transgender fertility.

Two independent physicians with training in obstetrics and gynecology categorized article links as accurate or misleading. Misleading articles were defined as those containing both accurate and inaccurate information, including commentary that may misinform patients seeking information based on peer-reviewed scientific research or inconsistent with ASRM guidelines. Any discrepancies were resolved through consultation by the senior author, a reproductive endocrinology and infertility physician. This study was exempt from the Institutional Review Board as it involves publicly available data and no human subjects.

**Results**

The top 10 article links for each time period were examined and divided into three categories: (1) scientific peer-reviewed journal, (2) news organization website, and (3) alternative media (e.g. blog, interview). The alternative media category contained the majority of links for both time periods (40%), followed by news organizations (35%) and scientific peer-reviewed journals (25%). For articles which came from scientific peer-reviewed journals, accurate content
predominated (100%), and the same trend was noted for articles which came from news organization websites (86%). Highly shared articles on alternative media websites had similar user engagement between accurate (50%) and misleading (50%) content (Table 1). Facebook was the most popular platform for sharing transgender fertility content for both time periods, with an average of 56 engagements per link in 2019 – 2020 and 17 engagements per link in 2020 – 2021. Facebook also accounted for the highest total number of engagements, followed by Twitter, Reddit, and Pinterest (Figure 1).

Articles shared by news organizations had the highest number of total engagements (Table 2). Alternative media was the primary source of popular article links. For 2019-2020, 80% of articles were graded as accurate and 20% as misleading or inaccurate. For 2020-2021, 70% of articles were graded as accurate and 30% as misleading or inaccurate. Across both time periods, 75% of article links were accurate and 25% misleading. There is a significant association between the number of engagements with accurate articles and the time periods used for analysis (p < 0.0001). Further, there is more likely to be a higher number of engagements with accurate articles in 2020-2021 compared to the year prior.

Fourteen peer-reviewed research studies comprised the primary citations used by 14 of the 20 total article links investigated (16–29). Of the 14 studies, 3 of them were referenced more than once by the article links (Table 3). The types of studies included retrospective cohort studies, cross-sectional surveys, case-control studies, and review articles. All of the studies except for two were published in the United States. The average journal impact factor was 10.5, with a standard deviation of 18.1.

**Discussion**

Transgender fertility is an emerging area of interest in the field of reproductive medicine. A significant proportion of the literature related to this topic has been published in the last decade, and this may allow physicians to be more comfortable with addressing the reproductive needs of this population. Our BuzzSumo search demonstrated that the majority of highly shared content on transgender fertility contains accurate information, and most of the top search results for both time periods included references to scientific studies.

Articles which were defined as misleading include those which highlighted key findings of research studies without commenting on the limitations of those studies. For example, one of the top links from 2019-2020 was a news article which included interviews from two board-certified reproductive endocrinologists and cited multiple peer-reviewed research studies (30). In contrast, another popular link from this time period featured a lay Youtube blogger stating that transgender women “may soon have babies” via uterus transplant (31). This headline may be misinterpreted by online users and does not provide sufficient background information to understand a more complex issue. We found that the most popular content on transgender fertility in the last year is more accurate compared to that of the year prior, which suggests that there is a trend towards filtering out health misinformation online.

Transgender fertility may still be viewed as a topic with a paucity of information given the relatively lower number of overall shares compared to other topics such as male infertility.
The top articles which generated interest covered a variety of topics ranging from fertility preservation to the effects of hormone replacement therapy, and this is important for both transgender patients with and without access to reproductive healthcare. Some articles may motivate transgender patients to seek additional information from their providers on topics which they may not have otherwise asked about. The most popular social media platform for sharing transgender fertility content is Facebook. This may be secondary to a higher number of monthly active users compared to other platforms (32). Facebook’s versatility also allows users to respond to content in multiple ways, which further increases engagement.

There are some notable limitations to this study. Due to the methodology used, the social media platforms of Instagram, TikTok, and Snapchat were not included in the analysis, as BuzzSumo does not track content or engagement for these websites. This data can be difficult to track as both Instagram and Snapchat include the feature of “stories” which makes some content inaccessible after 24 hours. Most of the analysis for engagement comes from Facebook, which makes the findings of this study most applicable to this platform. Further, only one search term, “transgender fertility” was used for this analysis. Additional combinations of related terms including “gender nonbinary” and even “transgender infertility” may have produced different results. Although our analysis demonstrated that some highly shared content may contain misleading information, Internet users may also recognize that not all social media content contains reliable information. Further research is needed on patient attitudes towards social media content, particularly in the area of fertility.

Conclusions

Transgender fertility content on social media is shared on various platforms which are widely accessible to Internet users and have varying degrees of accuracy. We found that the majority of highly shared information on transgender fertility is accurate, and the prevalence of shared accurate information has increased over time. The social media analytics module BuzzSumo can be used to help physicians better understand the content that Internet users engage with on the topic of transgender fertility, and this model can be expanded to other healthcare topics to assess for gaps in patient knowledge.

References


Figure 1. Total engagement by social platform
Table 1. Summary statistics of article sources and accuracy during 2019 – 2021

<table>
<thead>
<tr>
<th>Year</th>
<th>2019 – 2020</th>
<th>2020 – 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Source website</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Misleading or Inaccurate</td>
<td>Accurate</td>
</tr>
<tr>
<td>Scientific peer-reviewed journal</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>News organization</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Alternative media (e.g. blog, interview)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2. Two-year comparison for number of engagements in relation to article source and accuracy

<table>
<thead>
<tr>
<th>Article Source</th>
<th>Total Articles</th>
<th>Number of Engagements</th>
<th>June 2019 – June 2020</th>
<th>June 2020 – June 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Misleading or Inaccurate</td>
<td>Number of Engagements</td>
<td>Number of Engagements</td>
</tr>
<tr>
<td>Scientific peer-reviewed journal</td>
<td>3</td>
<td>188</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>News organization</td>
<td>4</td>
<td>4504</td>
<td>1</td>
<td>1700</td>
</tr>
<tr>
<td>Alternative media (e.g. blog, interview)</td>
<td>3</td>
<td>830</td>
<td>1</td>
<td>56</td>
</tr>
<tr>
<td>Scientific peer-reviewed journal</td>
<td>2</td>
<td>69</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>News organization</td>
<td>3</td>
<td>1296</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Alternative media (e.g. blog, interview)</td>
<td>5</td>
<td>153</td>
<td>3</td>
<td>98</td>
</tr>
</tbody>
</table>
### Table 3. Characteristics of studies referenced online

<table>
<thead>
<tr>
<th>Author and Year of Publication</th>
<th>Country of Publication</th>
<th>Key Finding</th>
<th>Study Population and Sample Size</th>
<th>Frequency of Study Being Referenced</th>
<th>Journal Name</th>
<th>Impact Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leung et al. 2019 (16)</td>
<td>United States</td>
<td>FTM transgender patients may have positive ART outcomes even if testosterone therapy has already been initiated</td>
<td>FTM transgender (n = 126) and cisgender patients (n = 130)</td>
<td>2</td>
<td>Fertility and Sterility</td>
<td>6.3</td>
</tr>
<tr>
<td>Wierckx et al. 2011 (17)</td>
<td>England</td>
<td>Majority of FTM transgender patients desire to have children</td>
<td>FTM transgender patients (n = 50)</td>
<td>1</td>
<td>Human Reproduction</td>
<td>12.7</td>
</tr>
<tr>
<td>Pang et al. 2020 (18)</td>
<td>United States</td>
<td>MTF transgender patients may be more likely to preserve their fertility</td>
<td>AMAB (n = 53) and AFAB (n = 49) patients</td>
<td>2</td>
<td>JAMA Pediatrics</td>
<td>13.9</td>
</tr>
<tr>
<td>Rothenburg et al. 2019 (19)</td>
<td>United States</td>
<td>FTM transgender patient had oocyte retrieval on GnRH agonist therapy</td>
<td>FTM transgender patient (n = 1)</td>
<td>1</td>
<td>New England Journal of Medicine</td>
<td>74.7</td>
</tr>
<tr>
<td>Turban et al. 2020 (20)</td>
<td>United States</td>
<td>Inverse association between treatment with pubertal suppression and lifetime suicidal ideation</td>
<td>Transgender adults (n = 619)</td>
<td>1</td>
<td>Pediatrics</td>
<td>5.4</td>
</tr>
<tr>
<td>Chen et al. 2017 (21)</td>
<td>United States</td>
<td>Rates of FP utilization among transgender youth are low</td>
<td>Transgender adolescents (n = 105)</td>
<td>1</td>
<td>Journal of Adolescent Health</td>
<td>3.9</td>
</tr>
<tr>
<td>Barnard et al. 2019 (22)</td>
<td>United States</td>
<td>Semen cryopreservation can be considered in patients who have already initiated pubertal suppression</td>
<td>MTF transgender patients (n = 11)</td>
<td>2</td>
<td>Pediatrics</td>
<td>5.4</td>
</tr>
<tr>
<td>Cheng et al. 2019 (23)</td>
<td>United States</td>
<td>Transgender patients should be educated on fertility preservation options</td>
<td>N/A – review article</td>
<td>1</td>
<td>Translational Andrology and Urology</td>
<td>2.4</td>
</tr>
<tr>
<td>Lai et al. 2020 (24)</td>
<td>United States</td>
<td>Clinicians should consider various factors when counseling transgender adolescents on fertility</td>
<td>N/A – review article</td>
<td>1</td>
<td>Journal of Adolescent Health</td>
<td>3.9</td>
</tr>
<tr>
<td>Balayla et al. 2021 (25)</td>
<td>England</td>
<td>Importance of discussing ethical considerations with uterus transplantation</td>
<td>N/A – review article</td>
<td>2</td>
<td>Bioethics</td>
<td>1.7</td>
</tr>
<tr>
<td>Marsh et al. 2019 (26)</td>
<td>United States</td>
<td>Cryopreservation of sperm prior to hormone therapy is a viable preservation option for MTF transgender patients</td>
<td>MTF transgender (n = 22) and fertile cisgender male (n = 17) patients</td>
<td>1</td>
<td>Journal of Assisted Reproduction and Genetics</td>
<td>2.8</td>
</tr>
<tr>
<td>Kirubarajan et al. 2021 (27)</td>
<td>United States</td>
<td>LGBTQ+ individuals face unique barriers in fertility care</td>
<td>N/A – systematic review</td>
<td>1</td>
<td>Fertility and Sterility</td>
<td>6.3</td>
</tr>
<tr>
<td>Sutter et al. 2002 (28)</td>
<td>United States</td>
<td>MTF transgender patients should be counseled on sperm cryopreservation</td>
<td>MTF transgender individuals (n = 121)</td>
<td>1</td>
<td>International Journal of Transgenderism</td>
<td>3.3</td>
</tr>
<tr>
<td>Nahata et al. 2018 (29)</td>
<td>United States</td>
<td>Rates of FP utilization among transgender youth are low</td>
<td>Transgender adolescents (n = 78)</td>
<td>1</td>
<td>Journal of Adolescent Health</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Abbreviations: FTM = female-to-male, MTF = male-to-female, AMAB = assigned male at birth, AFAB = assigned female at birth