

Public Attitudes Towards Male Postnatal Depression on X

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Abstract

Postpartum depression (PPD) is a mental health condition that affects new parents following childbirth. PPD is recognized globally as a condition that occurs only in mothers, causing fathers' experiences to be overlooked and not a part of public discourse. Fathers then often rely on social media to validate their feelings, fearing judgment from the public. This study aimed to explore whether this fear is justified or not. Utilizing computational sentiment analysis and thematic analysis, it was found that the overall public perception of male postnatal depression on social media was ambivalent, presenting both stigmatizing and supportive attitudes. Six key themes also emerged from the study: stigma, expectation of rejection, cultural norms and masculinity, support and advocacy, media influence, and intimacy and relationships.

Introduction

Postpartum depression (PPD) is a mental health condition that affects new parents following childbirth. It is important to differentiate PPD from the common "baby blues", which up to 75% of new mothers experience in the first two weeks after childbirth¹. Symptoms include anxiety, loss of appetite, and sudden mood changes¹. In comparison, PPD is more severe and may last several months to a year, with symptoms including fatigue, difficulty bonding with the baby, and thoughts of self-harm². These symptoms appear due to hormonal changes after childbirth and resolve once hormone levels stabilize².

PPD is globally recognized as occurring in women, as stated by The Diagnostic and Statistical Manual of Mental Disorders (DSM) (Segre & Davis, 2013). However, PPD affects both mothers and fathers. While 15% of mothers experience PPD¹, 8-10% of fathers have postnatal depression (PND) and face similar symptoms to mothers, yet their experiences are often overlooked (Scarff, 2019).

The perception of male PND (MPND) is not well understood, particularly regarding society's response to this condition. Unlike new mothers, fathers are not routinely screened for PND (Davenport, 2023), and the male experience of PND is not recognized in the DSM (Segre & Davis, 2013). This lack of recognition reflects societal attitudes towards men's mental health, which may perpetuate stigma or invalidate male vulnerability.

Despite growing research on MPND, public understanding of this issue is still limited, which plays a significant role in whether fathers feel supported in seeking help or remain silent about

¹ Cleveland Clinic. (2022). Postpartum depression: Causes, symptoms & treatment.
<https://my.clevelandclinic.org/health/diseases/9312-postpartum-depression>

² Mayo Clinic. (2022, November 24). Postpartum depression.
<https://www.mayoclinic.org/diseases-conditions/postpartum-depression/symptoms-causes/syc-20376617>

their struggles. Thus, they often turn to social media for validation and support. This study aims to understand whether such fears are justified by examining public perceptions of MPND, specifically on social media.

PND and PPD have the same range of symptoms, with the only difference being the time frame. PPD refers to the time frame exclusively after childbirth, while PND refers to the time frame during pregnancy and after birth³. However, in this paper, these two terms will be used interchangeably to reflect their use in the media.

Male Postnatal Depression

MPND has been studied as far back as 1962. Jarvis presented four case studies of new fathers who experienced MPND (Jarvis, 1962). In one case, a father began to distance himself from his wife and newborn to find emotional escape in his life through an affair with an older woman. Another father, consumed by his banking career, neglected his wife, had sexual troubles, and turned to heavy drinking. He also withdrew from meaningful communication, later displaying bizarre actions he could not recall (Jarvis, 1962). From Jarvis's case studies, it can be concluded that many dads have coped with fatherhood pressures through infidelity, alcoholism, and isolation. He further states that fatherhood is coped with in different ways; while some fathers may feel happy and have a strong bond with their new family, others experience emotional distress, similar to what mothers feel during postpartum.

More recent research has identified biological changes that fathers experience. In 2022, the first study regarding neurological changes in fathers' brains confirmed that, similar to women, there is a decrease in gray brain matter (Martínez-García, 2023). Though the change is less pronounced compared to women, these neural changes cause fathers to exhibit stronger infant bonding and increase susceptibility to depressive symptoms and difficulty sleeping (Martínez-García, 2024; Hoekzema, 2017; Saxbe, 2024). Furthermore, fathers' testosterone levels lower, mirroring the progesterone reduction experienced by new mothers. This amplified engagement and care towards their wives and children, but also increased the likelihood of them experiencing PPD (Saxbe et al., 2017).

Modern-day qualitative studies reveal that fathers struggle with unmet expectations about their performance as fathers, ultimately leading to feelings of guilt and frustration. Having learned that PPD only affects women, fathers often fail to initially recognize their depressive symptoms (Giallo et al., 2023; Pedersen et al., 2021).

Male Postnatal Depression Diagnosis

The DSM, published by the American Psychiatric Association (APA), is a diagnostic tool used by mental health professionals to define mental disorders. It lists symptoms and statistical data for diagnosing and has been dubbed the "bible of diagnosis" (Scarff, 2019). Though the depression mothers feel after delivering a child is often referred to as postpartum

³ Ignite Wellness Clinic. (2023, September 13). *Postpartum Depression Vs. Postnatal Depression*. Ignite Wellness Clinic. <https://ignitewellnessva.com/postpartum-depression-vs-postnatal-depression/>

depression, the DSM does not have a specific diagnostic category. Rather, it classifies PPD as “Major Depressive Disorder, with postpartum onset”, which was not introduced until 1994 with the publication of DSM-IV, the fourth edition of the DSM (Segre & Davis, 2013). In the DSM’s diagnostic criteria for PPD, they exclusively refer to women.

Despite evidence that MPND exists, from case studies to neurological changes, the DSM still lacks diagnostic criteria for it. Without formal recognition, fathers are less likely to be screened, diagnosed, or treated. For instance, Davenport’s study explored PND experiences among UK fathers through interviews. It was found that MPND is not routinely recognized in the UK, even though women are routinely screened for PPD. This demonstrates a disparity in mental health screening between genders, supported by the lack of recognition in the DSM.

Stigmatization of Male Mental Health and the Media’s Influence

Society tends to make male mental health taboo. Hegemonic masculinity refers to the culturally idealized manhood, characterized by traits like aggression and vulnerability avoidance (Connell, 2005). These societal expectations discourage men from seeking help and contribute to stigmatizing male mental health, including MPND. Davenport’s study showcases how hegemonic masculinity manifests: fathers feel the need to be the “rock” of their families and avoid showing vulnerability to meet the standards of hegemonic masculinity. Participants of the study also reported feeling shame, leading them to cope in silence.

These societal expectations are exacerbated by media representation, which reinforces traditional masculinity. Previous studies show that mass media significantly shape how the public perceives mental illness (Orchowski, 2006; Wedding, 2017). This influence raises questions about sources shaping men’s understanding of mental health. Gallagher’s research shows men’s health literacy is disproportionately shaped by media portrayals rather than medical sources. In interviews with ten men, many cited specific media depictions when discussing their mental health knowledge. Thus, one of the emerging themes was “This is all based on what I know from television.”

As men’s understanding of health remains heavily influenced by media portrayals, it becomes evident that this pattern also extends to MPND. Eddy et. al’s study showed how media can affect fathers with PND, using data from online forums such as howisdaddydoing.org, citydadsgroup.com, and thedaddycomplex.com. Fathers participating in the study had turned to these platforms because of the anonymity that they provided, allowing them to share their experiences and seek support. Six key themes emerged, including the need for education, adherence to gender expectations, and repression of feelings. Fathers felt unable to share their emotional struggles with wives or friends, fearing ridicule, thus worsening their feelings of loneliness and distress (Eddy, 2019).

Gap

MPND has growing evidence supporting its existence and impact on fathers. Studies have documented biological changes like a reduction in gray matter and testosterone (Martínez-García et al., 2023; Saxbe et al., 2017), and psychological changes like feelings of

inadequacy and resentment towards the baby (Giallo et al., 2023). Despite this, MPND remains underdiagnosed because of societal stigma towards men's mental health, which discourages them from seeking help (Pederson et al., 2021; Davenport, 2023).

Men's reluctance to discuss their experiences stems from their fear of stigma and judgment. This fear is evident in Eddy et al.'s study, where fathers expressed a strong desire to remain anonymous, revealing their apprehensions about facing judgment. Similarly, both Pederson et al. and Davenport et al.'s studies showcase fathers' concerns about being judged by family, friends, and colleagues. For instance, a participant in Pederson's study noted, "They won't open up because they are afraid that they get stigmatized [...] as someone [...] weak or inadequate." Davenport's research observed shifts in workplace relationships during this period. Together, these findings show the ridicule fathers feel comes not just from their immediate circles, but also from the public.

While these studies highlight fathers' fears, they primarily focus on individual experiences. A gap remains in understanding the broader social discourse surrounding MPND. Specifically, it is unclear whether the stigma that fathers anticipate aligns with actual public attitudes. Social media, which carries numerous public opinions, allows us to study this. By analyzing public perceptions of MPND on social media, this study looks to understand whether fathers' fear of judgment is exacerbated by misperceptions or is empirically supported. This leads to the research question: What is the public perception of male postnatal depression on social media?

Methods

To understand the public perception of MPND, this study used a mixed-methods approach, consisting of thematic analysis and sentiment analysis. Public perception refers to the collective attitudes, beliefs, and opinions held by a large and diverse group regarding a specific topic (Dowler et al., 2006). In this study, public perception encompasses both emotional responses (e.g., positive, negative, neutral attitudes) and societal concerns about MPND (e.g., intimacy) expressed through public discourse on X (formerly Twitter). This mixed-methods approach allowed for the collection of quantitative and qualitative data to represent the public perception. This also helps identify correlations between public sentiment and recurring topics (e.g., stigma and cultural norms) influencing how MPND is perceived and discussed. Sentiment analysis quantifies attitudes and labels tweets as positive, negative, or neutral, demonstrating an overview of public sentiment trends. Complementing this, thematic analysis qualitatively identifies recurring societal narratives, providing a thorough understanding of social attitudes characterizing these discussions.

Data Collection

X was chosen because of its established reliability, supported by numerous health-related attitudinal studies, including problem drinking (West et al., 2012), dementia (Robillard et al., 2013), and vaccination (Love et al.). These studies utilized X due to its ability to hold diverse public opinions because of its large user base, aligning with this study's goal of understanding public perception of MPND.

"Participants" in this study are X users who publicly shared posts related to MPND. No specific filters, like where users are from, follower count, or age, were applied during the tweet collection



process. This allowed for a wide range of public perspectives, consisting of news outlets, regular X users, and people who have been affected by MPND.

This study has based its methodology on Reavly and Pilkington's study on public attitudes towards schizophrenia and depression on X using thematic analysis. While their research identified stigma through manual thematic coding, grouping tweets under themes like 'neutral' or 'having negative attitudes', it did not use computational sentiment analysis. This paper expands on their approach by integrating sentiment analysis to quantify the polarity of attitudes. Thackeray's study, cited in Reavly and Pilkington's work, analyzed attitudes on X during Breast Cancer Awareness Month using computational sentiment analysis, demonstrating the effectiveness of this method in quantifying public attitudes.

Following Revley and Pilkington's study, this study utilized X's "Advanced Search" to ensure each tweet was relevant to PND. Key terms like "postnatal depression", "new dads", and "fathers" were applied to filter each tweet (see Appendix A). Reavly and Pilkington relied on hashtags to find relevant tweets, but this study omitted that method due to a lack of hashtags associated with MPND, as it is an under-discussed topic. All tweets collected were in English.

Another criterion for tweet selection was the presence of at least 5 replies to ensure tweets were publicly discussed rather than isolated opinions. This criterion also indicated what content had sparked discussions.

As MPND is a very niche topic, there is a lack of media coverage on these issues. Thus, there was no specific number of tweets to collect; rather, the focus was on collecting tweets that met the criteria above. All eligible tweets published between 2020 and 2024 were collected to maintain relevance.

Sentiment Analysis

Sentiment Analysis is a computational process of identifying and categorizing opinions expressed in text to determine whether the overall attitude is positive, negative, or neutral (Taboada, 2016). Two sentiment analysis models were used to analyze the public perception of MPND on X: VADER (Valence Aware Dictionary and Sentiment Reasoner) and the Twitter-Roberta-Base-Sentiment-Latest model. Using both tools helped reduce any potential bias and strengthen the validity of the data.

VADER combines a lexicon with rule-based algorithms to accurately interpret emotions in social media text⁴. It numerically classifies sentiment on a scale from -1 (negative sentiment) to +1 (positive sentiment), with 0 representing neutral sentiment. VADER also provides the percentage of positivity, negativity, and neutrality content of a given text⁴. Figure 1 shows a sample tweet analyzed using the VADER Python program (see Appendix B).

```
>>> %Run Vader_Analysis.py
Tweet: 'Does the world not have enough to worry about without
these sappy wimpy whinging about 'male post natal depression'.
'
→ Compound Score: -0.627 (Negative)
→ Pos/Neg/Neu: 0.14/0.26/0.60

>>>
```

Figure 1: VADER Analysis

This model was selected for its ability to analyze social media language (e.g., sarcasm, emojis). In Thackeray's study, MALLET, a computational linguistics tool, was utilized. However, due to MALLET's complexity, this study opted to use VADER, a more user-friendly natural language processing tool, to conduct the analysis.

Reavly and Pilkington had their team cross-check the coding process to ensure the results were accurate. However, as this study was done by a single individual, another model was used to cross-check labeling. To improve reliability, the Twitter-Roberta-Base-Sentiment-Latest model was utilized. This model classifies each tweet with the label positive, negative, or neutral (see Appendix C). This model was trained on the TweetEval data set, which consisted of 124M tweets from 2018 to 2021, thus enhancing its accuracy of labeling⁵.

Tweets with conflicting scores were manually reviewed. If Twitter-Roberta-Base-Sentiment-Latest model's classification was deemed more accurate, the VADER compound score was recalibrated by ± 0.25 – 0.5 points to make the chosen sentiment more clearly positive or negative.

Thematic Analysis

Thematic analysis finds patterns in text through rereading material (Fereday & Muir-Cochrane, 2006). This study utilized both inductive and deductive coding to ensure themes correlate with

⁴ Hutto, C. J., & Gilbert, E. E. (2014). VADER: A parsimonious rule-based model for sentiment analysis of social media text. *Proceedings of the International AAAI Conference on Web and Social Media*, *8*(1), 216-225. <https://vadersentiment.readthedocs.io/en/latest/>

⁵ Boardflare. (n.d.). *Sentiment analysis*. <https://www.boardflare.com/tasks/nlp/sentiment>

previous literature while allowing for organic discussions and themes to emerge, representing the attitudes and discourse of MPND. Inductive coding forms patterns and themes without predefined categories. Deductive coding is made through pre-determined themes based on previous literature (Fereday & Muir-Cochrane, 2006).

All tweets were read multiple times for familiarization, with notes recorded for recurring themes. Codes were organized into potential themes by aligning a color to each theme within Google Sheets. Inductive coding identified emerging themes of Advocacy and Support, and Intimacy and Relationships.

This study also implemented Bruce G. Link's labeling theory, as Reavly and Pilkington's study has done. Using a deductive coding approach, four themes - Stigma, Expectation of Rejection, Cultural Norms and Masculinity, and Media Influence - were predetermined using previous literature.

Stigma

Link's theory highlights how being labeled with a mental illness leads to discrimination, thus demonstrating stigma. Tweets in this theme were chosen if they included demeaning language like "coward" or emojis (e.g. laughing ("🤣"), regurgitating("🤮")), to show that MPND is a joke and disgusting, thus reinforcing societal stereotypes that discourage men from seeking help, fearing being labeled "weak" (Jarvis, 1962; Davenport, 2023). Tweets consisted of 3-4 words.

Expectation of Rejection

Expectation of rejection, as defined by Link, is the fear and anticipation of being judged, especially due to a stigmatized identity, like men identifying with PND. Tweets in this theme were chosen if they conveyed dismissive or invalidating attitudes regarding MPND, like "you do not have Post Natal Depression".

Cultural Norms and Masculinity

Connell's theory of hegemonic masculinity demonstrates how societal expectations discourage male vulnerability, leading to harmful behaviors like withdrawal or substance use instead of seeking help (Jarvis, 1962). Tweets were categorized in this theme if they referred to the social expectation for men to appear strong or unemotional, such as commenting, "Act like a man".

Media Influence

Media shapes public perception of mental health, often perpetuating stereotypes that portray mental illness as a weakness (Gallengher et al., 2022; Orchowski, 2006; Link, 1987). Tweets were chosen by observing if any references were made to articles or research papers. For instance, tweets cited publications like The Guardian and ABC, which are both news sources.

Data Analysis

The average sentiment was taken to understand the overall perception of MPND. The average sentiment scores across each label were also calculated to provide an overarching view of public perception and whether it was positive, negative, or neutral (Appendix D).

These are the following thresholds, which were modified from VADER's recommended thresholds⁴:

- positive sentiment: average score > 0.06
- neutral sentiment: (average score ≥ -0.06) and (average score ≤ 0.06)
- negative sentiment: average score <-0.06

To evaluate whether the sentiment in each theme significantly differed from the overall sentiment of all the tweets collected, this study used a two-sample t-test. This test compared the mean sentiment of a given theme (Treatment 1) to the overall mean sentiment of all tweets collected (Treatment 2). A p-value < 0.05 was considered statistically significant. Sentiment values were analyzed using the Social Science Statistics platform, using the "T-Test Calculator for 2 Independent Means" (see Appendix D)⁶.

The range of sentiment was recorded to show the degree of variance in sentiment scores for each theme, indicating whether sentiment differed greatly or was more uniform within a theme. Standard deviation (SD) was used to measure how much sentiment scores vary from the average. A high SD indicated diverse sentiment, while a low SD indicated more homogenized sentiment. The calculations were done by inputting the raw sentiment score of each tweet in a given theme into Calculator.net⁷ (see Appendix D).

In addition, average confidence scores were also taken from the Twitter-Roberta-Base-Sentiment-Latest model to assess the model's confidence in labeling. The higher confidence score indicated more certainty in the model's labeling.

Ethical Consideration

This study exclusively uses publicly available X data. As these tweets were voluntarily shared in public spaces, no private or sensitive information was accessed. There is no personally identifiable information being revealed, and all usernames are redacted to avoid unintentional exposure of users.

⁶ Social Science Statistics. (n.d.). *T-test calculator (Student's t-test)*.

<https://www.socscistatistics.com/tests/studentttest/default2.aspx>

⁷ Calculator.net. (n.d.). *Statistics calculator*. <https://www.calculator.net/statistics-calculator.html>

Results

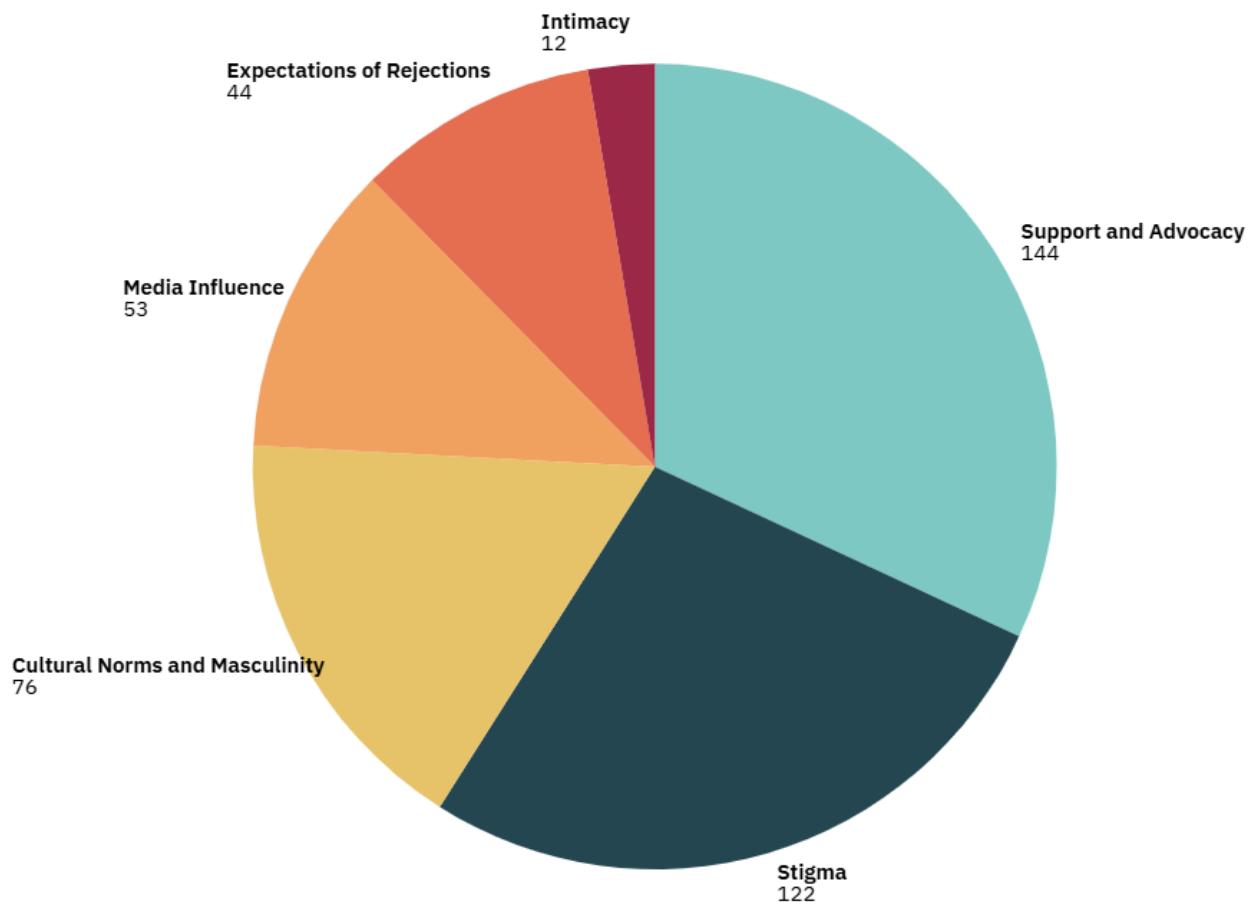


Figure 2: Tweets Collected Across Themes

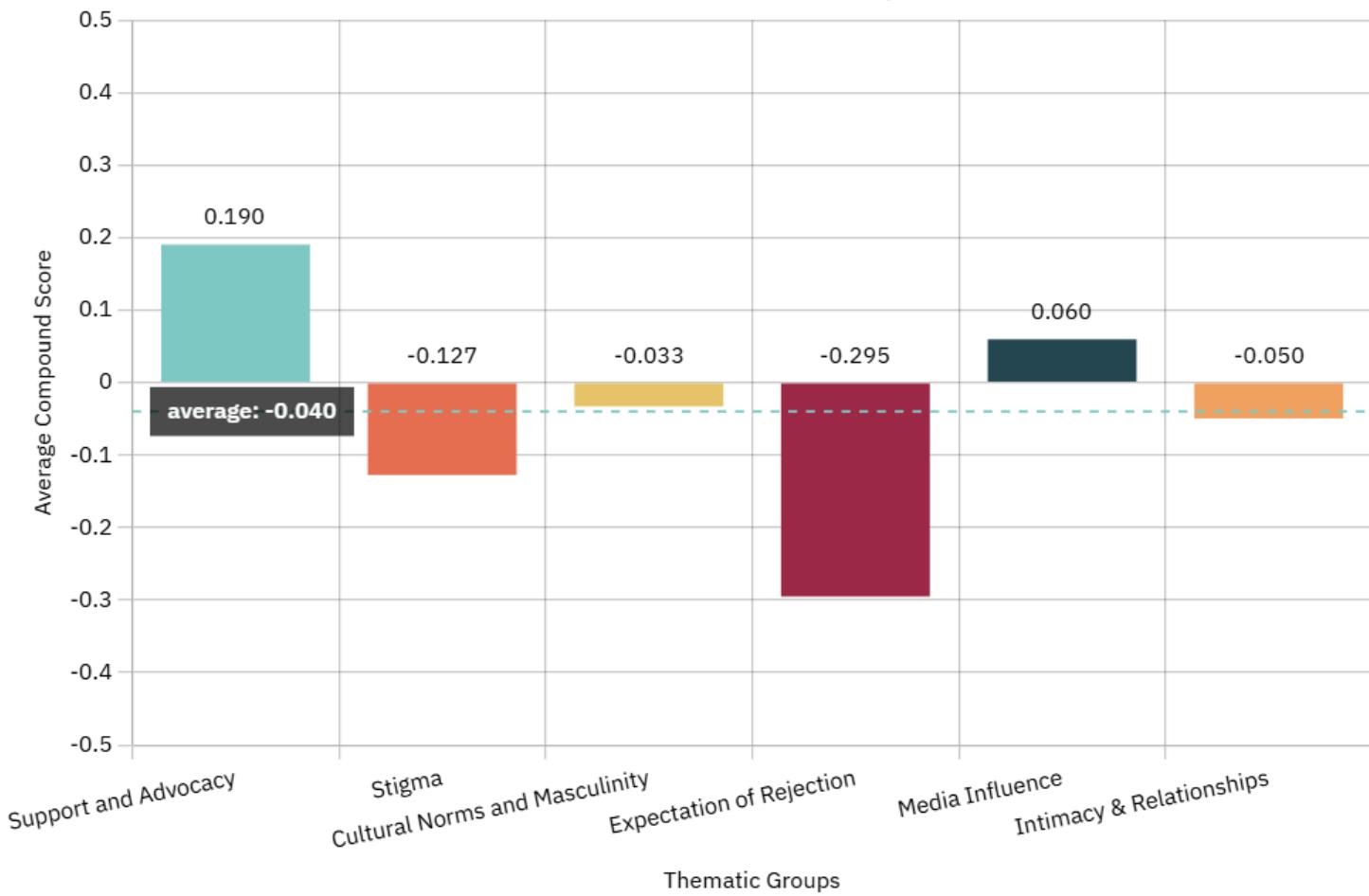


Figure 3: Mean Sentiment Across Thematic Groups

Figure 2 shows the number of tweets collected per theme, and Figure 3 shows the mean sentiment score for each thematic group. Support and Advocacy emerged as the largest group, including 144 tweets out of 461 tweets collected. This suggests an encouraging attitude towards MPND, supported by its positive mean sentiment (+0.190). In contrast, Stigma, the second-largest group with 122 tweets, had a negative mean sentiment (-0.127). Expectation of Rejection had the most negative sentiment score (-0.295), demonstrating resistance to acknowledging male vulnerability. More neutral-leaning sentiment scores were seen in Cultural Norms and Masculinity (-0.033), Media Influence (+0.060), and Intimacy and Relationships (-0.050), suggesting mixed sentiment and perception on MPND.

Table 1: Average Sentiment Scores Across Labels

Theme	Average Sentiment Scores Across Labels		
	Positive	Negative	Neutral
<i>Support and Advocacy</i>	0.735	-0.180	0.115
<i>Stigma</i>	0.152	-0.214	0.021
<i>Cultural Norms and Masculinity</i>	0.691	-0.150	0.148
<i>Expectations of Rejections</i>	-0.312	-0.349	-0.121
<i>Media Influence</i>	0.540	-0.266	0.010
<i>Intimacy & Relationships</i>	0.783	-0.284	0.299

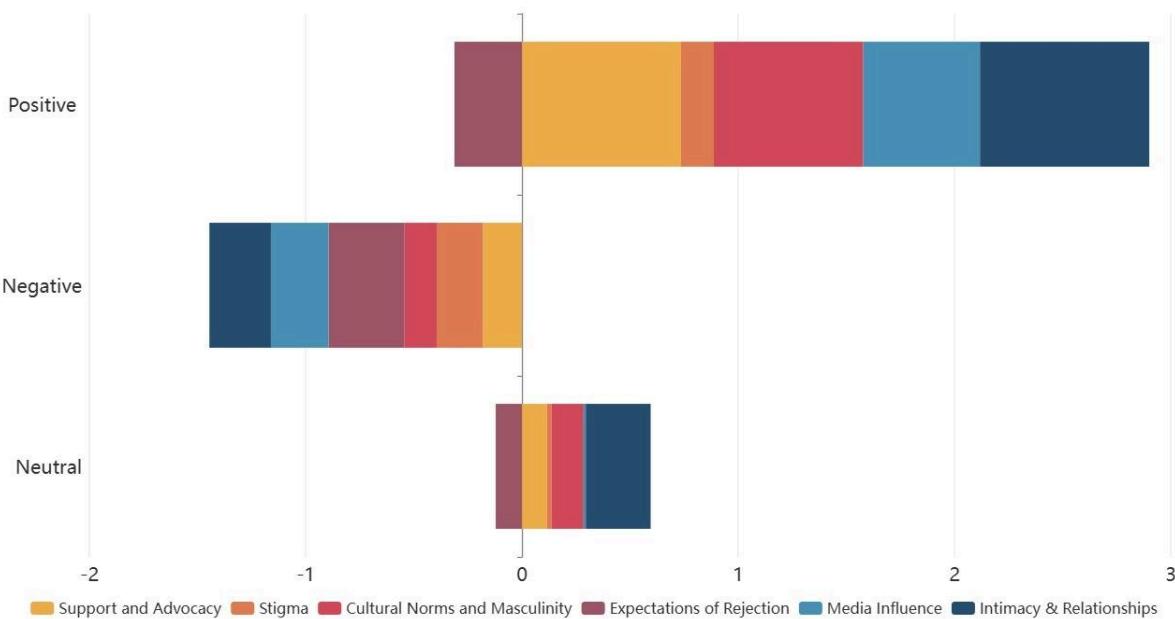


Figure 4: Distribution of Average Sentiment Scores by Theme and Label

Figure 4 illustrates average sentiment scores across positive, negative, and neutral labels within the six thematic groups related to MPND. Table 1 accompanies Figure 4 by representing each average label value. Segment lengths within each theme show the strength of the sentiment in each label; the longer the segment, the higher the average score. Figure 4 allows for a deeper understanding of the polarity in each theme, compared to the overview provided in Figure 3.

Support and Advocacy emerged as the most positively skewed theme (positive label: +0.735 vs. negative label: -0.180), reflecting encouraging online discussions. However, other sentiment scores highlight that positivity is not mirrored in all aspects of this discussion.

For instance, Expectation of Rejection stands out for its overwhelmingly negative sentiment, as all three label values are negative. Stigma was also skewed more negatively with a higher negative sentiment (-0.214) than positive (0.152), corroborating the mean sentiment score (-0.127) in Figure 3. This negative sentiment reinforces its role as a barrier to seeking help.

The sentiment associated with Cultural Norms and Masculinity is more ambivalent (positive label: +0.691 vs. negative label: -0.150), suggesting a gradual positive shift in the perception of masculinity. However, this trend does not corroborate the mean value of -0.033 (Figure 3), which suggests that the sentiments are skewed more negatively. The Media Influence theme also reveals a polarizing sentiment, with a positive score of +0.540 and a negative score of -0.266, resulting in a mild positive trend. This suggests MPND sentiment varies significantly depending on context. Finally, Intimacy and Relationships show the highest average positive sentiment (+0.783), emphasizing the importance of emotional connections as a source of strength for fathers. Table 2 summarizes the findings within each theme.

Table 2: Thematic Analysis of Male Postnatal Depression (PND) Discourse

Themes	Representative Tweets	Characterization	Overall Sentiment
Support and Advocacy	<p>“Aw, [REDACTED]. I’m so glad you’ve gotten through it ❤️ We’re all here for you and Jemma. Hope you’re doing ok”</p> <p>“Here in Sweden they check on the dads as well. Absolutely not as much as the moms but at least something.”</p>	Personal narratives, empathy, and validation of men’s emotional health; understanding that this experience is met with stigma and judgment, thus agreeing that MPND needs to be better understood and discussed more	Positive
	<p>“Coward.”</p> <p>“Absolutely disgusting.”</p> <p>“(愤怒表情符号)”</p>	Mocking, disbelief, and derogatory comments that undermine the male experience and emotions related to PND	
Expectations of Rejections	<p>“He certainly has problems, but they ain’t postnatal.”</p> <p>“What an ill informed idiot, postnatal depression is hormonal after having a baby, why does he think he could have that?”</p>	The belief that only women experience PND due to the hormonal changes childbirth brings, thereby dismissing the emotions men face as narcissistic or trivial	Negative
	<p>“...glad you have shone a light on PND especially in men. It goes undiagnosed way too often. Both my husband and I suffered with it, but many people discredit a man suffering. It’s a huge change for a man’s life too.”</p> <p>“How does a male get postnatal depression when that is caused by being pregnant and giving birth? He is deluded and needs inpatient psychiatric treatment and ‘his’ children need new parents who live realities.”</p>	Dismissal of men’s emotional struggles, adherence to traditional notions of masculinity that discourage vulnerability, and a tendency to compare new fathers’ experience to the unique challenges faced by women during and after childbirth	
Cultural Norms and Masculinity			Neutral
Media Influence	<p>“A great piece by @guardian - well done @BaldwinSharin.”</p> <p>“Absolute madness. @ABCaustralia can’t be trusted to report the truth.”</p>	Polarized discussion around MPND, with some rejecting the idea as misunderstanding the term, while others push for its acknowledgment, reflecting both skepticism towards media representation and calling for more inclusive discussion regarding new fathers’ mental health	Neutral
Intimacy & Relationships	<p>“You should reverse the roles: Focusing on the baby doesn’t mean literally refusing to even hug your husband. You need to have intimacy in these early stages of newborn life. Intimacy doesn’t mean sex here. It’s not stupid. It’s incredibly common.”</p>	A nuanced understanding of intimacy and relationships, emphasizing that emotional connection, affection, and support are essential for both partners, yet it is often overlooked amidst challenges such as fatigue and stress, leading to feelings of frustration and distancing between partners.	

The following analysis will consist of the interpretation of the statistical analysis for each theme, along with observational patterns seen within each theme. For most themes, the range was about 1.910, indicating no theme had a consensus on sentiment/opinions.

Table 3: Statistical Summary for Sentiment Scores: Stigma Theme

Stigma	
Mean	-0.127
Range	1.909
Standard Deviation	0.474
p-value	0.004
t-value	-2.922

Table 3 represents the statistical analysis of the Stigma theme. The *t*-value of -2.92 indicates a negative skew from the mean, reflecting an overall negative sentiment. The SD is the second lowest out of all the themes, demonstrating that the opinions are more negatively homogenized. This sentiment is significant at $p < .05$, demonstrating the negativity associated with stigma in public discourse.

The discussion of Stigma had many overlaps with traditional gender roles, where fathers' experiences were downplayed to avoid undermining mothers' experiences. Derogatory language with words like "WTF", "wet wipe", and "lazy" was used throughout the tweets. The joke "He better depress them dishes/utensils" was used three times, with "You ain't never partumed 🤣🤣🤣🤣" used twice. These comments show the pervasiveness of hegemonic masculinity in public discourse, shaping the perception of MPND through constant resentment of fathers' experiences. This persistent stigma may potentially deter fathers from expressing vulnerability or seeking help (see Appendix E for sample tweets).

Table 4: Statistical Summary for Sentiment Scores: Cultural Norms and Masculinity Theme

Cultural Norms and Masculinity	
Mean	-0.032
Range	1.908
Standard Deviation	0.564
p-value	0.636
t-value	-0.473

Table 4 represents the statistical analysis of the Cultural Norms and Masculinity theme. The t-value of -0.473 indicates a small skew from the mean, reflecting an overall neutral sentiment. The SD of 0.564 indicates moderate variability in opinion, suggesting less homogeneity than the Stigma theme, thus supporting its neutral sentiment. Because $p>0.5$, these results are not statistically significant.

The discussion regarding Cultural Norms and Masculinity revealed MPND is dismissed as “attention-seeking” or biologically impossible, with tweets like “Postnatal depression is a uniquely female condition” reflecting this view. Additionally, the word “appropriate” appeared seven times in comments like “appropriating women’s suffering”, reinforcing the societal belief that only women can experience PND and perpetuating stigma around male vulnerability. However, some comments expressed that fathers need help: “All too often we only think of the mum suffering from PND and the dad gets forgotten”. But, even within these comments of recognition, many rejected the term “postnatal depression”. One user stated: “While I do not doubt men can have depression after a baby, it’s not postnatal depression. It would be its own form, and would require help tailored to men, not women.” These comments demonstrate the difference of opinion regarding the masculinity expected from fathers, thus showing that the public perception of MPND is nuanced, rather than outright negative (see Appendix F for sample tweets).

Table 5: Statistical Summary for Sentiment Scores: Expectations of Rejections Theme

Expectations of Rejections	
Mean	-0.295
Range	1.664
Standard Deviation	0.437
p-value	0.000
t-value	-4.392

Table 5 represents the statistical analysis of the Expectations of Rejections theme. The *t*-value of -4.392 indicates a negative skew from the mean, reflecting an overall negative sentiment. The SD is the lowest and the range is the second lowest out of all the themes, demonstrating opinions are more negatively homogenized. This sentiment is significant at $p < .05$, demonstrating the negativity associated with stigma in public discourse.

The discussion surrounding Expectation of Rejection reveals a strong attitude to frame the father's experiences as fake. For instance, the comment, "What an ill informed idiot, postnatal depression is hormonal after having a baby, why does he think he could have that?", represents the common belief that PND is an exclusive hormonal change experienced by women. Such comments reveal a scathing attitude towards vulnerable fathers. These comments reveal the deep skepticism about men's ability to express PND (see Appendix G for sample tweets).

Table 6: Statistical Summary for Sentiment Scores: Media Influence Theme

Media Influence	
Mean	0.059
Range	1.902
Standard Deviation	0.659
p-value	0.504
t-value	0.672

Table 6 represents the statistical analysis of the Media Influence Theme. The low *t*-value of 0.672 indicates a low skew from the mean, reflecting an overall neutral sentiment. However, the "neutral" label given to this theme is due to the polarized nature of the discussion. This

polarization is reflected in the SD as it is the largest among all themes, demonstrating that the opinions are the most diverse within this theme. Because $p>0.05$, these results were not statistically significant.

The majority of X's threads regarding media influence had discussed ABC Australia's article titled "I struggled in silence": Battling postnatal depression as a queer dad.⁸ Given the already taboo nature of MPND and the stigmatization of queer experiences, many tweets expressed negative sentiments. Users tweeted 'Defund the ABC..' and "Made me LIVID. The female erasure and appropriation of women is off the charts at @ABCAustralia". Notably, some articles were met with support, especially those where the author was the one tweeting. One user said: 'Well done [REDACTED], and thank you - this is a nice piece, setting out what it can be like for some new Dads. So needed.' This theme represents the polarizing public perception of MPND, especially when paired with oppressed identities like queer fatherhood. Both disdain and support for fathers highlight the complex societal attitudes towards male mental health (see Appendix H for sample tweets).

Table 7: Statistical Summary for Sentiment Scores: Support and Advocacy Theme

Support and Advocacy	
Mean	0.000
Range	1.910
Standard Deviation	0.598
p-value	0.000
t-value	3.858

Table 7 represents the statistical analysis of the Support and Advocacy Theme. The t-value of 3.858 indicates a high skew from the mean, reflecting an overall positive theme. The SD is moderately low, indicating a more homogenized positive sentiment. Because $p<0.05$, the results are statistically significant.

Most of the tweets in this theme originated from a well-known YouTuber discussing their overcoming of MPND. Consequently, much of the support expressed in the tweets came from their fans, which likely explains the strong positive sentiment reflected in the data. Among this category, 24 tweets expressed the idea "Men have emotions too!!!!", 9 tweets had "proud of you" messages, and 6 tweets included "Thank you" messages towards users speaking up about their experience with PND. This theme reflects a very positive and open-minded attitude towards the possibility of men experiencing PND (see Appendix I for sample tweets).

⁸ Szeps, S. (2023, June 7). *Postnatal depression as a queer dad: 'I felt like a failure'*. ABC News. <https://www.abc.net.au/news/2023-06-07/postnatal-depression-as-a-queer-dad-sean-szeps/102356928>

Table 8: Statistical Summary for Sentiment Scores: Intimacy and Relationships Theme

Intimacy and Relationships	
Mean	-0.049
Range	1.636
Standard Deviation	0.600
p-value	0.797
t-value	-0.263

Table 8 represents the statistical analysis of the Intimacy and Relationships Theme. The t-value of -0.263 indicates a low skew from the mean, reflecting an overall neutral theme. The SD is the second highest, indicating more diverse attitudes towards this topic. Because $p>0.05$, the results are not statistically significant.

Many tweets debated the perception that a lack of sexual intimacy leads to relationship shortcomings, emphasizing that intimacy involves more than just sex; it includes emotional support. Some commenters express frustration at partners who prioritize sexual needs over support during the challenging postpartum period: "Do you think a wife WANTS to do those things for a husband that acts like a spoiled child by fighting with her about why he isn't getting enough sex or attention?". Others reflected on how parents need to support each other through parenthood. One user wrote: "You both are supposed to be there for each other mentally, physically, and emotionally". Rather than a positive or negative attitude towards PND, this theme highlights how the definition of intimacy is challenged and changed when adjusting to parenthood (see Appendix J for sample tweets).

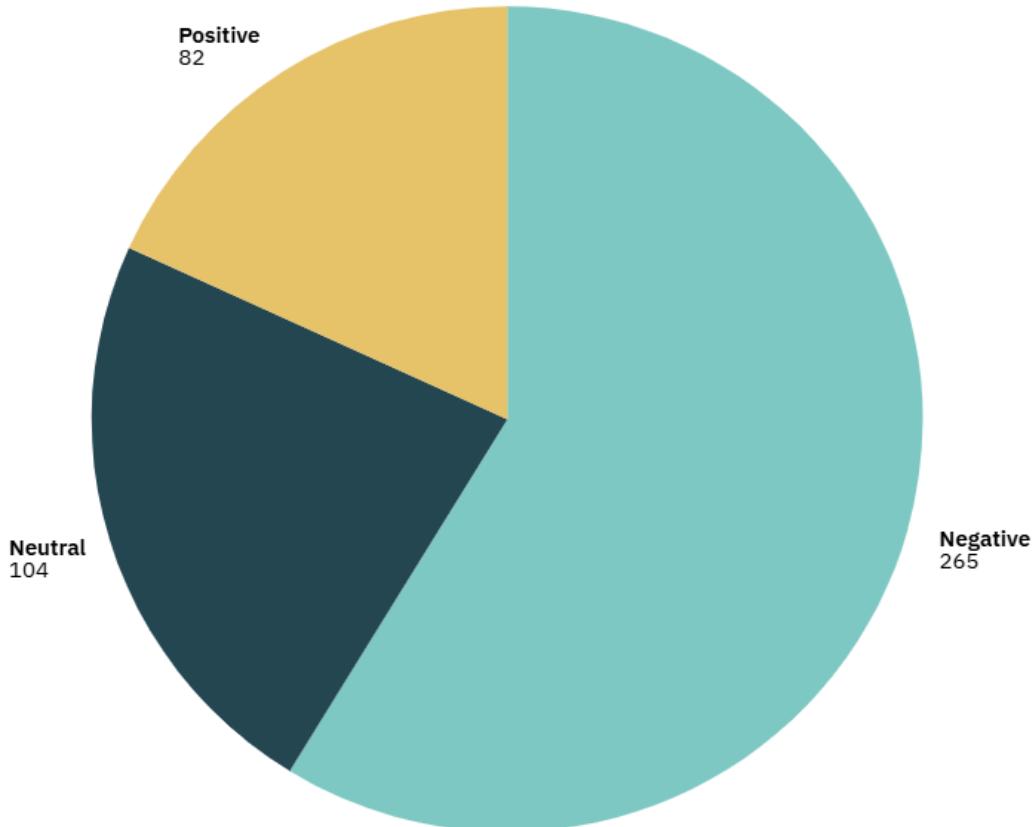


Figure 5: Tweets Collected Across Labels

From Figure 5, which includes the number of Tweets collected across the three labels, the largest group is negative sentiment, with 265 tweets collected. The smallest group is positive sentiment, with 82 tweets collected.

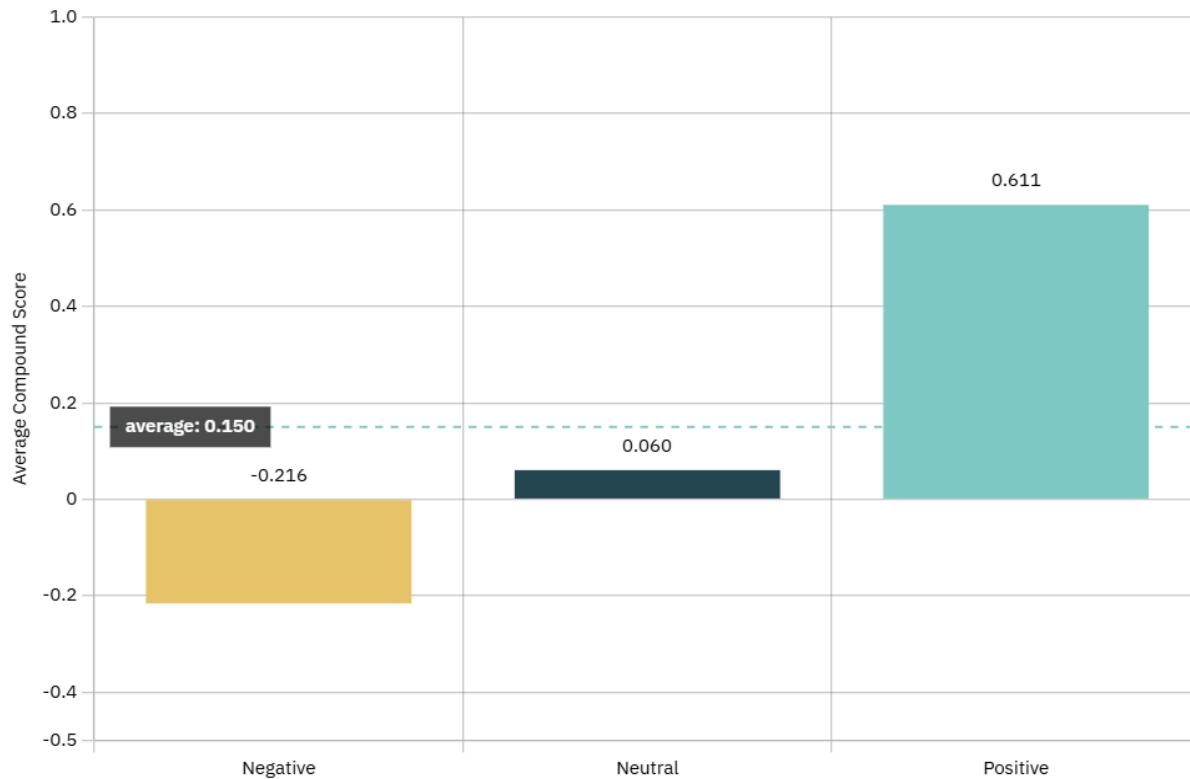


Figure 6: Mean Sentiment score across labels

The mean sentiment scores in Figure 6 do not skew as negatively as Figure 5 suggests. The positive label has the strongest sentiment (+0.611), despite having the fewest tweets. In comparison, negative sentiment averages only -0.216. Contrary to Figure 5, the average sentiment is 0.150, indicating a predominantly neutral sentiment. This suggests that public perception of MPND is more ambivalent than outright negative. The relatively lower neutral sentiment may also result from stronger and more polarizing opinions on MPND.

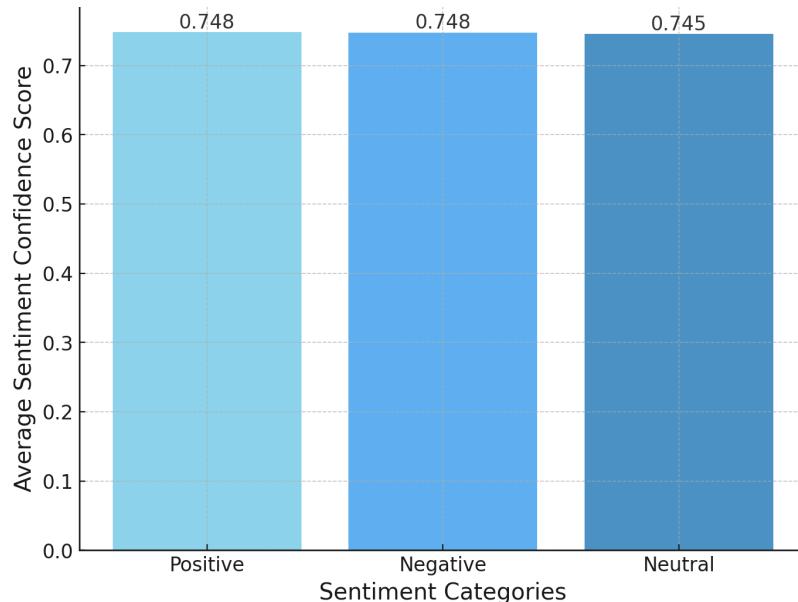


Figure 7: Average Confidence scores by Sentiment Label

Figure 7 shows confidence scores of approximately 75% across all three labels. The high accuracy validates the Twitter-Roberta-Base-Sentiment-Latest model as each label aligns with the VADER model's corresponding label.

Limitations

This study includes a few limitations that may have influenced the interpretations of its findings. First of all, this study was conducted by a single individual. While this ensured consistency in coding, it may have introduced unconscious bias when deciding which themes to categorize the tweets into, thus making the interpretation of the results subjective. Without intercoder reliability checks, the identified themes may not fully reflect the true public perceptions of MPND. This limitation may have affected the conclusion about public attitudes, like the emerging support for MPND, which may appear more prevalent due to subjective coding decisions.

Secondly, computation models like VADER struggle to interpret sarcasm and contextual/cultural nuances, which could influence the accuracy of labeling, especially with polarizing themes like Media Influence. This may affect the results about sentiment trends as the tools may oversimplify or inaccurately identify public opinions, despite each code being cross-checked manually. Future research should use team-based coding, like Reavly and Pilkington's study, and consider working with a linguist or discourse analyst to improve the interpretations of nuanced language and to strengthen the reliability of results.

Finally, the dataset was limited to X, which is used primarily by younger people and may have missed capturing the perspectives of all demographic groups. Additionally, certain themes, like Intimacy and Relationships, had a smaller sample size, leading to fluctuating p-values. This suggests that sample sizes were too small to yield statistically significant results. This highlights the need for larger datasets in future studies to ensure that the results are statistically significant, thus generalizable.

Findings and Implications

The findings of this study reveal that public perception of MPND is ambivalent, as evidenced by sentiment analysis (Figure 6), which showed an overall neutral sentiment. This neutrality, however, arises from polarized opinions rather than indifference, suggesting that public discourse on MPND has the potential for openness to new information. However, this neutrality may also mean that there is low awareness regarding this topic, aligning with the idea that even fathers themselves do not know MPND exists (Giallo et al., 2023), and the lack of acknowledgment MPND receives in the DSM and clinical settings (Davenport et al.'s, 2023).

Interestingly, the strong positive support sentiment in Figure 6 (+0.611), along with the emergence of the Support and Advocacy theme, contradicts previous studies like Pedersen's, where fathers often anticipated judgment rather than support when disclosing their struggles. This suggests that fathers may encounter more supportive responses than expected. The positive feedback received by the YouTuber also demonstrated that sharing their vulnerabilities with their partners and close ones will most likely be met with positive feedback.

However, barriers to men expressing their vulnerability still exist. The persistence of negative sentiment in themes like Stigma (-0.214) and Expectation of Rejection (-0.295) shows the continued influence of transitional gender norms and societal stigma. For instance, common sentiments like "man up" and accusing men of "appropriating women's experiences" align with Connell's theory of hegemonic masculinity, which demonstrates that male vulnerability is not accepted in society, thus implying that public perceptions of MPND are still met with stigmatizing views.

Media Influence revealed both progress and ongoing challenges. Positive reactions to articles on MPND contrast with Gallagher's critique of media-driven stereotypes, suggesting that public sentiment varies by context. However, stigmatizing responses, particularly toward queer fathers, align with Link's findings, emphasizing that marginalized identities face more stigma. Similar patterns can be identified in Cultural Norms and Masculinity. Contrasting and corroborating the theory of hegemonic masculinity, many were supportive of "men finally showing emotion", while others also continued to enforce traditional masculinity with sentiments like "grow some balls". These contrasts show the evolving attitudes and slow transition to a less rigid idea of masculinity.

Throughout all themes, even in Support and Advocacy, many had rejected the term "postnatal depression" for men, despite acknowledging the distress new fathers experience. Many had argued that PND is hormonally exclusive to mothers, which directly opposes Saxbe et al.'s and Martínez-García et al.'s study on hormonal and neurological changes that men experience



during the postnatal period. Overall, the prevalence of contradicting themes (Support and Advocacy, and Stigma), along with the overall neutral sentiment, shows the ambivalent nature of the public perception of MPND.

The findings of this study provide valuable insights that organizations like the Postpartum Support International (PSI) and other health advocacy groups can use to further the recognition and understanding of MPND. PSI, which has been actively advocating to have MPND recognized in the DSM, can use the themes identified, particularly Intimacy and Relationships, to address the specific concerns raised by fathers. These themes can help improve the design of PSI's father support groups⁹. Furthermore, PSI can also update its article to reflect the confusion about biological changes seen in dads and what the terms PPD and PND encompass. The APA may also benefit from this research to gain a clearer understanding of what stigmatizing attitudes towards men's mental health look like and develop more inclusive clinical practices.

⁹ Postpartum Support International (PSI). (n.d.). Dad support group.
<https://postpartum.net/group/dad-support-group/>

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Appendix A

The following is the filtered search applied on X's "Advanced Search"

Advanced search

Words

All of these words
Men, Father Parent, parenthood

Example: what's happening - contains both "what's" and "happening"

This exact phrase
Example: happy hour - contains the exact phrase "happy hour"

Any of these words
men fathers dad Post-Natal

Example: cats dogs - contains either "cats" or "dogs" (or both)

None of these words
Example: cats dogs - does not contain "cats" and does not contain "dogs"

These hashtags
Example: #ThrowbackThursday - contains the hashtag #ThrowbackThursday

Advanced search

Include posts with links

Only show posts with links

Engagement

Minimum replies
5

Example: 280 - posts with at least 280 replies

Appendix B

The following is the code used to run the VADER Python program to get the sentiment scores in the Thonny IDE. The code was adapted from Hutto & Gilbert (2014).

```
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer
analyzer = SentimentIntensityAnalyzer()

tweets = [
    "Does the world not have enough to worry about without these sappy wimpy whining about 'male post natal depression'."
]
#analyzer.lexicon["sad"] = 0

for tweet in tweets:
    scores = analyzer.polarity_scores(tweet)
    print(f"Tweet: '{tweet}'")
    print(f" → Compound Score: {scores['compound']:.3f} (Positive)" if scores['compound'] >= 0.05
          else f" → Compound Score: {scores['compound']:.3f} (Negative)" if scores['compound'] <= -0.05
          else f" → Compound Score: {scores['compound']:.3f} (Neutral)")
    print(f" → Pos/Neg/Neu: {scores['pos']:.2f}/{scores['neg']:.2f}/{scores['neu']:.2f}\n")
```

Appendix C

The following is a sample of how the Twitter-Roberta-Base-Sentiment-Latest model. It is an extension on Google Sheets, so the sentiment analysis was run there.

Text - Model: Twitter Messages	Label	Confidence Score
Men finally experiencing emotions (yay) is not equivalent to post partum depression.	neutral	0.5428301096
Yea, when we finally got them home I had a complete breakdown. Didn't understand why I wasn't feeling the way I thought I should>felt like a failure as a father> rinse and repeat. Also, newborn lack of sleep was the match that lit the lighter fuel of my mental state.	negative	0.9115107059
You lost me with "cis men"	negative	0.8110923767
Some folks are committed to being, and staying, dumb as dogshit	negative	0.8591852784
It's also reactionary AF to be constantly talking about women as the mechanism by which we increase the population.	negative	0.8067329526
The screenshot posted very clearly states men can develop hormone changes as early as during pregnancy	neutral	0.8659291863

Appendix D

The following are the equations I have used for my statistical analysis, accompanied by Calculator.net and Social Science Statistics:

Statistical	Equation
t-value	$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$
	(Social Science Statistics, n.d)
Range	Highest Sentiment Value per theme - Lowest Sentiment Value per theme
Standard Deviation	$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$
	(Calculator.net, n.d)
Mean	$\bar{x} = \frac{1}{N} \sum_{i=1}^N x_i$
	Calculator.net, n.d)

P-value

Calculated using Social Science Statistics

Appendix E

The following is a sample of the data collected from the Stigma Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
'Queer family.' Queer and family shouldn't be in the same sentence. Are we expected to feel sorry for a privileged gay man who bought 2 babies?'	0.44	neutral	0.8374087811	0.15	0.05	0.81
'We allowed these namby pamby liberals to stop competition, discipline & common sense in schools, churches or in the home. 'There can be no winners or losers' they cry. 'It'll break their spirit' we hear!'	-0.568	negative	0.7997437716	0.1	0.19	0.7
...	0	positive	0.6189120412	0	0	1
🤣🤣🤣'	0.863	negative	0.5534200668	0.44	0	0.56
🤣🤣🤣🤣🤣'	0.943	negative	0.6333241463	0.44	0	0.56
😢😢😢😢😢😢😢'	0	neutral	0.3860631585	0	0	1
😂😂😂'	0.827	neutral	0.6117029786	0.44	0.22	0.34
😂😂😂😂'	0.891	neutral	0.5875155926	0.44	0.22	0.34
😂😂😂😂'	0.891	neutral	0.5875155926	0.44	0.22	0.34
😂😂😂😂😂'	0.947	neutral	0.5728961229	0.44	0.22	0.34
😂😂😂😂😂😂'	0.96	neutral	0.6430524588	0.44	0.22	0.34
🙄🙄🙄'	0	negative	0.6665052772	0	0	1
Absolute dick head.'	-0.511	neutral	0.5167204142	0	0.62	0.38
Absolute wet wipe.'	0	neutral	0.5732412934	0	0	1
Absolutely disgusting.'	-0.571	negative	0.8550571203	0	0.79	0.21
Are we sure that isn't a trans man?'	0.318	negative	0.8863820434	0.25	0	0.75
Are you daft?'	0	negative	0.5086984634	0	0	1
At least you didn't leave your family like all of those other people. And also, tell your wife and Asher that I said hi. I know Asher won't remember this but I will remember it. Thanks Dan. And good job getting through rough times.'	0.86	positive	0.6145523787	0.21	0	0.79
At this point we're being trolled 🤪.'	0	negative	0.8156715631	0	0	1
Buyer's remorse is more likely than PND in someone who has never been pregnant but instead purchased other human beings. Caveat emptor.'	-0.141	neutral	0.6179826856	0	0.07	0.93
Clearly not in enough silence!'	0.457	positive	0.4529692829	0.43	0	0.57
Conversion disorder is a mental illness.'	-0.66	negative	0.9025892019	0	0.57	0.43
Coward.'	-0.459	negative	0.522698462	0	1	0

Appendix F

The following is a sample of the data collected from the Cultural Norms and Masculinity Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
"emotional needs to just a desire for sex is misleading, unfair, and frankly sexist." Exactly, sex is overrated for men, intimacy is not.'	-0.361	negative	0.8371515274	0.15	0.2	0.65
Act like a man for gosh sake.'	0.361	negative	0.93241781	0.29	0	0.71
Ah Dan glad you have shone a light on PND especially in men. It goes undiagnosed way too often. Both my husband and I suffered with it, but many people discredit a man suffering. It's a huge change for a man's life too. Best wishes especially of the healing kind.'	0.9	positive	0.414667666	0.26	0.09	0.65
Amen. I think it is a fruit of the fact that women tend to view childbearing as some superhuman task that they are giving to the world out of their abundance of generosity. Rather than a basic expectation of womanhood. They forget that demands are made on men all the time.'	0.586	neutral	0.5915419459	0.1	0.03	0.86
Another insult to women from a misogynistic man. Sean may have been depressed, but to compare it to the real post partum depression suffered by women who have given birth is just ridiculous. Stop whining because you are not female FFS.'	-0.891	negative	0.9207186699	0.07	0.41	0.52
Another insult to women from the corporate overlords. Any women in corporate America just playing along with this b.s. should be counted statistically as a man, since that's how they are identifying culturally. We are treated as subhuman by all men.'	-0.361	negative	0.5235242248	0.04	0.07	0.88
Anyone who knows a woman who has been through this knows this is bullshit. Adjusting your life to a child is not equal to that experience.'	-0.586	negative	0.6698050499	0	0.13	0.87
As soon as men start to become physically and emotionally 'unavailable', women are happy to go off and cheat with the support and cheering of other women.'	0.772	negative	0.7369492054	0.27	0.08	0.64
Being a first time parent, or just a parent in general in such a huge shift from what you're used to. I'm glad to hear you're doing better. I think a lot of people don't realize that men can experience this too. Sending all our love from this family to yours ❤️"	0.949	positive	0.745818615	0.25	0	0.75
Bingo! Classic male behaviour.'	0	neutral	0.5479340553	0	0	1
Bugger off @ABCaustralia. Post natal depression is a uniquely female condition. Natal = relating to birth.'	-0.572	negative	0.9057588577	0	0.2	0.8
Everywhere you look it's men appropriating female experience and calling it their own.'	0	negative	0.7296819687	0	0	1
Father calls for more postnatal depression support for men after suffering breakdown.'	-0.627	negative	0.7622535229	0.16	0.37	0.47
Glad your feeling better dan, and well done for speaking out! Not enough men or women talk about post natal depression enough. Its good to talk x'	0.79	positive	0.9114615917	0.34	0.1	0.56



Hate when they say this!! They're really just mad they're expected to get up do shit around and for the baby cuzzz they want 100% of it all to be on you.'	-0.901	negative	0.904125928 9	0.03	0.27	0.7
How does a male get postnatal depression when that is caused by being pregnant and giving birth? He is deluded and needs inpatient psychiatric treatment and 'his' children need new parents who live reallives.'	-0.318	negative	0.675840914 2	0.06	0.1	0.84
I agree with what you said but men are often poor communicators. Standing at the bedroom door staring at your tired wife and the whole "we haven't had sex in a while.." thing isn't enticing. Both parents will be tired. Both parents will be insecure and lonely. This is where.'	-0.959	negative	0.679255366 3	0.03	0.29	0.68
I literally got in the car and drove to the airport with the intention of flying away to Mexico. Then, when I was there with my feet on the ground of Sydney airport, I thought, 'Wow, this is rock bottom. I need help.' 😂😂 what a Mom thing to do.'	0.906	negative	0.941875278 9	0.2	0.05	0.75
I think some men struggle with the life changes but not all. However, to call it postnatal depression is a wrong description as PND is hormonal.'	-0.897	negative	0.491159111 3	0	0.32	0.68
I wonder if men having less friends nowadays Isn't helping. Plus no one's having kids so they don't have anyone to tell them what to expect?'	0.423	negative	0.806732952 6	0.17	0.07	0.76
I would like to know what doctor suggested he had PND. It comes from physical changes as much as mental ones. There's nothing a woman has men won't appropriate.'	0.361	neutral	0.533016979 7	0.08	0	0.92
I'm pretty conservative and I think he sounds very immature. It's trendy right now to champion men but this feels pathetic to me.'	-0.361	negative	0.891418159	0.15	0.17	0.68
I've been watching the conversations about the op all day. People need to listen to the song, 'to be a man' by Dax. Open up to a new perspective.'	0	neutral	0.722086548 8	0	0	1
Imagine if he had to cope with the real hormones flux, bleeding, pain, leaky sore boobs, y know the real post natal experience that birth giving mothers have to experience.'	-0.527	negative	0.934607744 2	0.07	0.17	0.77



Appendix G

The following is a sample of the data collected from the Expectation of Rejection Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
"I hope Sean gets the help he needs. But no Sean, you do not have Post Natal Depression. Kindly fuck off with appropriating a very real condition faced by women post-partum. "I struggled in silence": Battling postnatal depression as a queer dad."	-0.954	negative	0.6617984176	0.13	0.36	0.51
Cant go on the gargle cos I'm fucking babysitting again.'	0	negative	0.654175818	0	0	1
Depressed about the reality of sleepless nights and his freedom curtailed. Plonker.'	0.226	negative	0.9136663675	0.24	0.19	0.57
Dude deleted his X because he was found to be seeking gay sex online. Probably want to express little to no sympathy for this person.'	-0.208	negative	0.8860861659	0.05	0.12	0.83
Ffs 🙄'	-0.586	neutral	0.6396423578	0	0.49	0.51
Good grief! Poor weans will have Post Parent Depression! :P'	-0.714	negative	0.8960357904	0.27	0.5	0.24
He certainly has problems, but they ain't postnatal.'	-0.039	negative	0.6515009999	0.18	0.19	0.63
He didn't give birth. He didn't have fluctuating pregnancy hormones. He didn't have postnatal depression. He had depression. Does it make him feel better to appropriate a condition he doesn't have which is irrelevant to the birth of his trafficked children?'	-0.67	neutral	0.9492499828	0.06	0.15	0.79
He doesn't have postnatal depression. He is just struggling to keep from consciously acknowledging his self-loathing. Wake up, Sean!'	-0.778	negative	0.7744353414	0	0.28	0.71
He is simply very tired! 🙄'	-0.54	neutral	0.5246758461	0	0.28	0.72
He is talking absolute b*****s.'	0	neutral	0.6389229894	0	0	1
He lost the crowd when he tried to justify infidelity and minimized the efforts of his wife.'	-0.318	negative	0.7876885533	0	0.13	0.87
He probably struggled with not being the center of attention of his partner anymore.'	-0.34	negative	0.8941073418	0	0.16	0.84
He seemed shocked to experience 'sleep deprivation' with a newborn...(!) WTF?? He may well have had Depression, but he sure as s*** didn't have Post NATAL Depression!'	-0.88	negative	0.8892024159	0.12	0.37	0.51
He's a man and they can claim anything that belongs to us, apparently.'	0	neutral	0.7925105095	0	0	1
He's complaining 8 WEEKS POSTPARTUM?! Good lord. Has she even been cleared for intercourse yet? I just can't with this. Sorry, no sympathy. He needs to suck it up.'	-0.548	negative	0.9283989668	0.12	0.24	0.64



I am quite confused. This person did not give physical birth but says they had postnatal depression?'	-0.781	negative	0.921180903 9	0	0.31	0.69
I'd diagnose he is suffering from some form of delusional fucktardia. He is definitely suffering from some form of mental health issues if he believes he's suffering from post natal depression.'	-0.883	negative	0.936510145 7	0.07	0.31	0.62
It only hit me the first time my son moved out and came back 😂.'	0.44	negative	0.571827948 1	0.17	0.08	0.75
It's OK, he's an idiot. He likes to pretend.'	-0.226	positive	0.775944352 1	0.21	0.35	0.44
Just depression that is all.'	-0.572	negative	0.599510371 7	0	0.48	0.52
Kicks in if one moves out and then comes back 😞.'	0	positive	0.620558440 7	0	0	1
Men have been fathering kids since the year dot and up until now no man has claimed postnatal depression, his hormones didn't change when his wife gave birth. fs.'	-0.71	positive	0.631283462	0	0.18	0.82
My grandma raised 8 kids by herself while working 2 jobs. This man is weak sauce.'	-0.44	negative	0.924675464 6	0	0.16	0.84
Next he'll confide in us about his stretch marks.'	0	neutral	0.871669769 3	0	0	1
No doubt he is suffering from depression, but postnatal is specifically caused by physical changes of pregnancy and childbirth. Not postnatal depression.'	0.285	neutral	0.581911325 5	0.2	0.16	0.64
No they don't.'	-0.296	negative	0.858349025 2	0	0.52	0.48

Appendix H

The following is a sample of the data collected from the Media Influence Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
@ABCAustralia failing again. misusing words does not change reality. No man can have 'post natal depression. No man can be 'post natal'. You should be asking why this whining asshole doesn't start his own group of 'bought baby regret' men.'	-0.878	negative	0.8818898797	0.04	0.24	0.72
@RudeMatrix good article. Strongly advise against reading the replies to this tweet though!'	0.648	neutral	0.5061944127	0.33	0	0.68
A great piece by @guardian - well done @BaldwinSharin.'	0.735	neutral	0.6788439751	0.47	0	0.53
A topic that I would discuss with families/clients when I was a Health Visitor. Often overlooked by many.'	-0.026	positive	0.7096081376	0	0.06	0.94
Absolute madness. @ABCAustralia can't be trusted to report the truth.'	0.361	negative	0.7683824897	0.35	0.19	0.46
Ah, Dan, I fucking love you. From the beginning of my Minecraft adventures, you've helped me with everything.'	0.784	positive	0.971919179	0.3	0	0.7
And of course he's the partner of an ABC radio presenter! I like Josh Szeps as a presenter, yet to give space to this outrageous self ID of 'motherhood' is such biased journalism it makes me sick. He's a pretend woman who can create his own group.'	-0.718	negative	0.911687851	0.08	0.19	0.73
Comments disabled why?'	0	neutral	0.5715996027	0	0	1
Dan, you're such a great person and no matter what me and all of Team TDM are here for you always ❤️ You've helped me through my depression so I'm here to help you anytime ❤️'	0.929	positive	0.9685600996	0.33	0.09	0.58
Defund the ABC.'	0	negative	0.8782505393	0	0	1
Disgraceful article ABC. Postpartum depression is a complex serious debilitating condition, related to changing hormones, the birth, and tiredness. This man just had depression brought on by the shock of parenthood. Treatable with antidepressants.'	-0.883	negative	0.9157266021	0	0.27	0.73
Every single corporation has been hijacked.'	0	negative	0.7847633958	0	0	1
Everyone needs to send their comments to the ABC. Nothing will change unless we protest, relentlessly & publicly. Like they do.'	0.128	negative	0.6836732626	0.11	0.09	0.81
Excellent piece.'	0.572	positive	0.9755179286	0.79	0	0.21
Fantastic 🙌.'	0.557	positive	0.9711045027	0.64	0	0.36
For my latest Republic of Parenthood column I wrote about how men can get postnatal depression and birth trauma, too	-0.886	negative	0.503316462	0	0.28	0.72



and how oppressive gender roles stop them from being able to talk about it'						
Great article, I am hoping to look at how primary care can support new fathers and increase inclusion as part of my masters dissertation next year. Would be good to link up  !	0.952	positive	0.9636116028	0.39	0	0.61
Great article! Would you be interested in taking part in my current research project? I have a survey and I am looking for interview participants! thanks'	0.883	positive	0.9806113839	0.31	0	0.69
Great to raise the profile of a very hidden subject in such a well read public space! Great to see well done Sharin.'	0.913	positive	0.9786711335	0.4	0	0.6
Great to see @BaldwinSharin piece on fathers' mental health in @guardian. Raising awareness of perinatal mental illness in fathers/partners that is often overlooked or minimised but can have significant consequences if left untreated- getting help early can make a big difference.'	0.751	positive	0.9847104549	0.18	0.06	0.76
I didn't know that, that is so sad my fav YouTuber the YouTuber that made me start YouTube and was the FIRST EVER YOUTUBER I WATCHED when I was 5. I watched ur old Minecraft videos with the mods. I still watch you and I will always watch ur content!!'	-0.321	positive	0.7976408601	0.06	0.08	0.86
I didn't read this stupid article but isn't postnatal depression related to hormones?"	-0.82	neutral	0.5794666409	0	0.41	0.59
I have to applaud you for being real with people. As a celebrity, it's nice to see the human side that isn't on camera, to show everyone you're a person too.'	0.7	positive	0.9016456604	0.17	0	0.83
I love how, even though most of your audience is kids, you treat them like real people rather than dumbing down to be kid-friendly. It's a shame most of them don't understand and just want you to play Minecraft.'	0.818	positive	0.8799849749	0.26	0.09	0.64

Appendix I

The following is a sample of the data collected from the Support and Advocacy Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
16 years later & I still think of how he might have turned out if fate had been a little kinder.'	0.442	negative	0.908706367	0.13	0	0.87
Admitting you have an issue and asking for help are very difficult. It is great you are open about mental health issues. I suffered 6 mths terrible PND and wanted little to with my son. Then struggled for another year. I was 42-it's affects any age. Your tweet may help others.'	-0.248	neutral	0.4952091575	0.15	0.18	0.68
After almost 7 months I feel I've finally beaten Post-Natal Depression. I can't explain why or how I felt so low which is partly why I found it so hard to deal with. A combination of therapy, time and speaking openly with my Wife helped me to overcome it.'	-0.878	negative	0.460049808	0	0.2	0.8
After giving birth both my son and I were very ill. My husband spent the day running between the special baby unit and the recovery area to check on us. He honestly thought one of us was going to die and says it was the worst day of his life.'	-0.612	negative	0.806389153	0.13	0.18	0.7
All love and prayers go you'	0.637	positive	0.8791778088	0.46	0	0.54
All this thread tells us is women only care about the science when it's used to excuse women. That exact same science is laughed at when applied to men.'	0.758	negative	0.7904125452	0.22	0	0.78
Also a dangerous blanket statement'	-0.477	negative	0.7778632641	0	0.44	0.56
And something tells me that if the roles were reversed and a new mother said this, y'all would not be treating it like a laughing matter.'	0.7	negative	0.651024878	0.23	0	0.77
And you should feel safe to express that and ask for a change in how things are handled when you feel that way. There's nothing wrong with that at all.'	0.666	neutral	0.6657761931	0.16	0	0.84
Aw, Dan. I'm so glad you've gotten through it ❤️ We're all here for you and Jemma. Hope you're doing ok'	0.839	positive	0.9475314617	0.32	0	0.68
Awhhh 😊😊'	0	positive	0.8441268206	0	0	1
Being a father means constant, never-ending sacrifices for the welfare of your kid. It's not pleasant, which is why a lot of men (and women) don't want to be parents and why being a parent is not for everybody. I understand this guy's frustration, but that comes with kids.'	-0.461	negative	0.8107280731	0	0.1	0.9
Can't agree on this. You might think it's wrongly labelled because he can't possibly have the internal hormonal triggers but all the external factors known to cause depression are there. symptoms were real. experience was real. We need to be careful not to always denigrate men.'	-0.691	negative	0.9148712754	0.04	0.13	0.83
Christ I remember being up 3 in the morning feeding my daughter nearly crying cause I was so tired, in work at 6! It's called being a dad,'	-0.798	negative	0.7126784325	0	0.21	0.79

Cis men do in fact experience rapid hormonal changes prior to and after the birth of their children, which are hypothesized to strengthen the parent-child bonding process and predispose them to caring for a crying child.'	0.34	neutral	0.72988146 54	0.13	0.07	0.79
Congrats, Dan!'	0.571	positive	0.97028720 38	0.79	0	0.21
Congrats! I'm so happy you've made it! I'm watching a video of yours right now! Stay strong! ❤'	0.952	positive	0.98926228 28	0.52	0	0.48
Correct me if I'm wrong but isn't PND triggered by the body and brain adjusting after the birth and the stress of 24hr care of a new born?'	-0.115	neutral	0.52325564 62	0.12	0.16	0.71
Damn. Dude deleted his tweet and now it's every 3rd tweet I see. If he deleted it, it's because he didn't want it out there. Could have at least cut out his name...'	-0.615	negative	0.88930952 55	0	0.17	0.83
Dan wow bringing this subject up must have been hard for you I respect you even more now. My 2 boys and I have watched you for years and you bring great content to us. Please be strong and keep up the good work. This from a 46-year-old dad that enjoys your uploads!!'	0.972	positive	0.93063908 82	0.34	0.02	0.65
Dan, I'm glad that you made it through everything and everything is better now for you. Stay safe and feel safe, bro ☺'	0.931	positive	0.93424195 05	0.44	0	0.56
Dan, you should always know and remember that all of us, your whole audience, will always be there for you. I don't think you realize how many people your videos, and other content, have helped through such tough times by you just being yourself. We're always there ❤'	0.572	positive	0.91985487 94	0.08	0.03	0.89
Do you think hormonal changes have zero effect on mood??'	0	negative	0.59287613 63	0	0	1
Doesn't make what he said okay.. And if anything, this puts the baby in more danger. He should get therapy before going back around the baby and his wife !!'	-0.523	negative	0.84078615 9	0.06	0.12	0.82
From dealing with y'all.'	0	negative	0.50331646 2	0	0	1
From what others are saying his further comments detail how she wouldn't even hug him or talk to him with kindness. I think these were the bigger roots of the issue if true.'	0.836	negative	0.64998519 42	0.23	0	0.77
Glad you're feeling better Dan ❤️'	0.891	positive	0.96784168 48	0.59	0	0.41
Good 4 you! I'm glad you are feeling better'	0.862	positive	0.97566676 14	0.6	0	0.4
Happiest & scariest time of my life. One I will be eternally grateful to my ex, the mother of my daughter. She was our second attempt. We lost our first, a boy, to a miscarriage. My partner received much support from friends family & medical people. I was just left to get on with it.'	0.893	negative	0.79472869 63	0.2	0.04	0.77



Appendix J

The following is the data collected from the Intimacy and Relationship Theme

Text - Model: Twitter Messages	Sentiment Compound score	Label	Confidence Score	Positive	Negative	Neutral
And this did not happen from birth, the relationship was probably without any intimacy for months before that. Sexless marriage always fail. Anyway twist plot she made him a gay housemate.'	-0.542	negative	0.7069901824	0	0.1	0.9
Because you're a woman. His woman. His partner. You both are supposed to be there for each other mentally, physically, and emotionally. And if you can't be there for him in that way, and he can't even pay attention to his own emotions, what are you here for?'	0.076	neutral	0.736301899	0.03	0	0.97
Do you think a wife WANTS to do those things for a husband that acts like a spoiled child by fighting with her about why he isn't getting enough sex or attention? She'd probably be much more willing to make space for his needs if he was doing his share with the baby.'	0.296	negative	0.4727255106	0.08	0.04	0.87
I am not sure I get this. Post partum syndrom is linked to the hormones chaos that follows giving birth. Not sure how it affects the partner that does not give birth... Tiredness, anxiety, short nights, extra work ok but depression for the partner?'	-0.813	negative	0.8622484803	0.06	0.23	0.71
I'm surprised by how many people seem to associate intimacy only with sex or sexual acts. Part of it is that he's mentioned they've been fighting. To me, that suggests they aren't snuggling, holding hands, or sharing other moments of physical intimacy.'	0.296	negative	0.7289540172	0.1	0.05	0.84
My doctor told me to abstain from sex for 6 weeks after my C-section-because I was recovering FROM SURGERY. This is why women need to stop getting married. There is no benefit. You're disgusting.'	-0.795	negative	0.9311902523	0	0.21	0.79
Sex isn't the only form of intimacy, lady.'	0	neutral	0.7232006788	0	0	1
Sex isn't the only form of intimacy. Dating culture really is broken.'	-0.523	negative	0.6913205981	0	0.23	0.77
She had a baby 8 weeks ago...she should be focused on the baby. This is the time for the dad to be focused on taking care of her and the baby...this is stupid.'	0.612	negative	0.9143490195	0.21	0.08	0.71
They should reverse the roles: 'My husband had open-heart surgery 8 weeks ago. I can see why women cheat at this time. My husband completely ignored my existence for the first few weeks and we had to have arguments to get him to acknowledge me not to mention be intimate. /1 x.com/The_Feminist_T...'	-0.807	negative	0.7625265718	0	0.14	0.85



This man should feel closer to his wife than ever before, and not because of sex. It's because he and his wife just created a perfect child together. They both should be so in love with that little baby that it brings them closer. Instead, this man can only think about his dick.'	0.783	positive	0.7317610979	0.16	0.05	0.78
You're confusing intimacy with just sex. Intimacy is much more than whether or not he's having sex; it involves emotional connection, affection, and kindness. This feels like a callous and judgmental evaluation based on little more than speculation.'	0.823	neutral	0.5428301096	0.23	0.04	0.73