

Text Mining Outcomes: Redefined Role of Working Women/Men During Pandemic 2020

AUTHOR

Abstract

Coronavirus that struck the world in early 2020 has created severe turbulence in human life. Lockdown imposed by the government and norms of social distancing defined a new way of office work for working professionals. This involved connecting to colleagues using online methods. Working men and women had to also contribute to domestic chores. The authors themselves being working woman/man have felt a change in the work life balance for both men and women professionals where roles have been redefined with inclusion of significant domestic responsibilities. As part of the exploratory study to understand this change, the authors have selected a sample of articles (documents) written by experts. Further, they have used text mining algorithms on the unstructured text data to identify outcomes. The word cloud and bar chart capture frequently appearing words across the documents, the Association with related words has been studied, dendrogram and clustering check data relationship in independent clusters. The study concludes that during the pandemic, men and women both have faced the brunt of turbulence at their workplace. Additionally, irrespective of gender, both have contributed towards domestic responsibilities.

Keywords: pandemic, covid, lockdown, text mining, text analytics, women, men, gender, domestic, housework

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I. Introduction

The pandemic that hit the world in the year 2020 has brought about significant upheaval. Very different from any virus that medical professionals have come across, it has brought a wave of changes in the day to day activities of human life. Its characteristics are unique, infecting people of any age, gender or geographic location. In an effort towards containing it, experts have suggested wearing masks in public places and maintaining social distance. People have chosen to be safe protecting their family from the external world. Educational institutions have refrained from calling students physically to campus, students at schools and colleges are studying online from their home. Everyday supplies like groceries, fresh produce, other essentials are being purchased online. Paid domestic help from external sources has been kept to a minimum to avoid contact with external world. Elders, children in the family and members with comorbidities require extra care, protection and adequate nutrition.

In such a situation, the working woman of the household has made a conscious choice to provide the backbone for smooth transition and management. This cannot be successfully achieved without support from other male and female family members of the household, the most natural being the male (her partner). Both act as the front face to protect their FAMILY. This is the case in typical nuclear families that constitute of husband, wife, children and elderly parents.

The paper by (Sofer, C., Thibout, C. (2019)) has discussed how partners share domestic work based on the investment made by her in her career. It states that working women perform less domestic work during weekdays compared to weekends. However, on an average, women still spend more time on domestic work compared to their partners.

II. Objective Of Research

The work life balance has changed for both men and women professionals due to covid-19, where roles have been redefined with inclusion of significant domestic responsibilities. The objective of this exploratory study is to be able to identify the contours of the redefined roles from articles written by experts during the pandemic.

III. Research Methodology

The authors have used textual content available in public domain from articles authored (penned) by experts on the role of working women during the pandemic. From the available content, they have attempted to study common observations by experts across the articles. The research is primarily exploratory.

The textual content in the document is in unstructured form. Text mining using R software has been used to compare the documents. The documents have been converted to plain text, cleaned to remove extra text such as punctuations, stopwords, whitespaces, numbers and then kept in a folder for access by the Rstudio software. Seven articles have been selected as sample from the following online repositories: Mint, Femina, World Economic Forum, BBC, PYMNTs, Vox and ThePrint respectively. These articles have matched the topic of the research study. The population of the data available is recent and small, as there are not many articles available yet on this topic. This is because the impact of covid-19 is recent and experts have begun penning it down in recent times. The sample size also thus remains small.

The first article selected titled “Can Covid-19 change the work culture at home for men and women?” (Rukmini S., August 2020) appeared in the Mint. It describes how both men and women have rearranged their daily activities to juggle between existing and additional responsibilities thrust upon them.

The second article selected titled “Post Covid-19 for women in work: Perspectives from India” (Srishty Anand, May 2020) appeared in the Femina. It has discussed the impact of the pandemic on both men and women. It indicates that while the pandemic is not gendered, the state response to it has been such that its impact in division of roles and responsibilities has been different for men and women.

The third article selected titled “Covid-19 could wipe out gains in equality for women at work – U.N.” (Lavietes M., July 2020) appeared in the World Economic Forum. It describes the disproportionate impact of Covid-19 on both men and women at work and at home.

The fourth article selected titled “Coronavirus – Will women have to work harder after the pandemic?” (Uchoa P., July 2020) appeared in the BBC World Service. It has discussed the impact on professional work life of women due to additional responsibilities such as unpaid care work at home during Covid-19.

The fifth article selected titled “eCommerce helps women hard hit by India’s shutdown” (PYMNTs, June 2020) appeared in the PYMNTs.com. It discusses how the impact of pandemic will set back the clock on the progress made by women at work. This can be somewhat moderated using eCommerce.

The sixth article selected titled “Women’s work, housework and childcare before and during Covid-19” (Boca D., June 2020) appeared in the VOX. It describes the division of additional domestic responsibilities between man and woman of the household with women taking more of the household responsibilities while childcare being divided equally between both.

The seventh article selected titled “Covid pushed women back decades. India can’t be ‘atmanirbhar’ without bailing them out” (Prakash S., June 2020) appeared in ThePrint. It describes how women have gone back to their grandmother days of daily work routine.

The outcomes obtained from the text analysis have been explained in the following “Results” section. Using text mining code in Rstudio, word cloud and bar chart of frequently occurring terms has been created. Further, the Association with related words like “covid” and “women” has been studied. Additionally, dendrogram and clustering outputs have been used to check data relationship in independent clusters.

Using text mining, R code has been built to access the plain text documents in the designated folder. The following R libraries have been used – tm, SnowballC, ggplot2, word cloud, NLP, plyr and fpc. After loading the documents in R Studio, the plain text documents have been cleaned by removing extra text content such as punctuation marks, whitespaces, numbers and stop words. Additionally, certain commonly appearing words that do not add value to the outcome have been blocked from the analysis. Common examples of such words are as follows: are, and, the, can and the like.

Since the authors have consciously selected articles about women during pandemic, the frequency of appearance of the word “women” during analysis was very high (172). The next frequency in descending order was for men (44). The gap between them is large. Including “women” for analysis was inhibiting certain significant words that appear for lower number of times across the documents. Except for establishing Association, the word “women” has therefore been blocked during the entire analysis.

IV. Results

Result 1: Identification of 25 most commonly occurring words across the documents.

The Table 1 indicates 25 most frequently appearing words and their respective frequencies. We can see that words such as housework, childcare, more, care, home, during appear in the list. This indicates that during the pandemic for both men and women, housework, care for children, job and home are words that have significant presence.

To investigate this further, the authors tried to establish association between the words as seen in Tables 2 and 3.

TABLE 1

NO	WORD	FREQUENCY
1	Men	44
2	Have	42
3	Working	42
4	Housework	41
5	Covid	40
6	More	38
7	But	35
8	Her	30
9	She	30
10	Childcare	29
11	Was	29
12	Pandemic	28
13	Home	27
14	Lockdown	26
15	Jobs	25
16	Than	24
17	Were	23
18	During	21
19	Economic	21
20	Female	21
21	Gender	21
22	Care	20
23	Image	20
24	Labour	20
25	Most	20

Result 2: Association of terms

Table 2 represents the Association of the word “covid” with other terms across the 7 documents with a correlation limit of 0.5 or above. For this particular test of Association of words, the authors have included the word “women” in the analysis. We see that from result in Table 2, there is high correlation of “covid” with both “men” (69%) and “women” (70%) along with “working” (91%) and “domestic” (74%). The division of domestic work may have been done based on gender (51%). It could have been done by mutual consent or thrust upon. This can be further investigated in future research.

TABLE 2: Association with the word “covid”

Working	During	Domestic	Market	Have	Hours	Women	Men	Gender
0.91	0.84	0.74	0.71	0.70	0.70	0.70	0.69	0.51

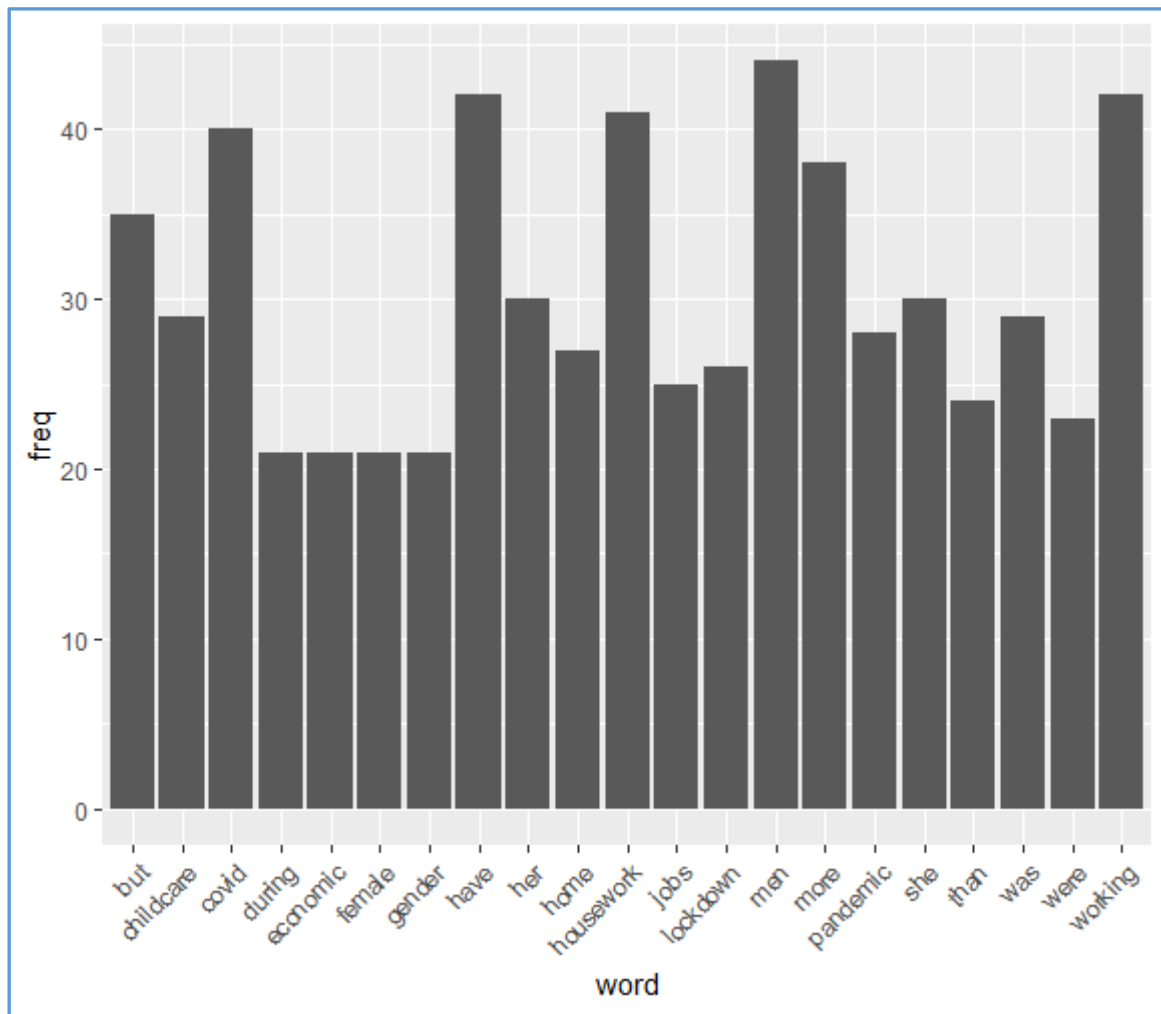
Table 3 represents the Association of the word “women” with other terms across the 7 documents with a correlation limit of 0.5 or above. We see that from result in Table 3, there is high correlation of “women” with “men” (85%) and “hours” (67%) along with working (72%) and more (81%). We can conclude from Tables 2 and 3 that during covid, both men and women have spent more hours in domestic work. Certain articles have discussed it in relation to inappropriate division of responsibilities based on gender. However, the outcomes of the association from the sample data states that gender does have a role to play but, in general, work load at domestic front has increased for both men and women.

TABLE 3: Association with the word “women”

Men	Have	More	During	Working	Covid	Market	Hours	Most	All	Than	Already
0.85	0.84	0.81	0.72	0.72	0.70	0.70	0.67	0.67	0.65	0.58	0.52

Result 3: Word cloud and column chart of frequently occurring words

IMAGE 2: Column chart



Result 4: Cluster representation

Image 3 shows the dendrogram of the frequently occurring terms in tree representation for hierarchical clustering. A two cluster representation has been shown by the red rectangles.

In the first rectangle, we find that “covid” is similar to “working”. The term “working” has been used in the articles to represent men and women who are performing a task be it in the office or home. With the advent of covid, impact on work has been very significant. Hence, these two terms are correlated. The other clade correlates the term “men” with the leaves “have” and “more”. All five terms in this rectangle can be analysed as follows: during covid, men have experienced more impact on working schedules. The term “more” is a degree, which compares their work schedule before and after the onset of covid.

In the second rectangle, it is implied that irrespective of gender, during the pandemic, both men and women had to perform domestic work.

IMAGE 3: Dendrogram

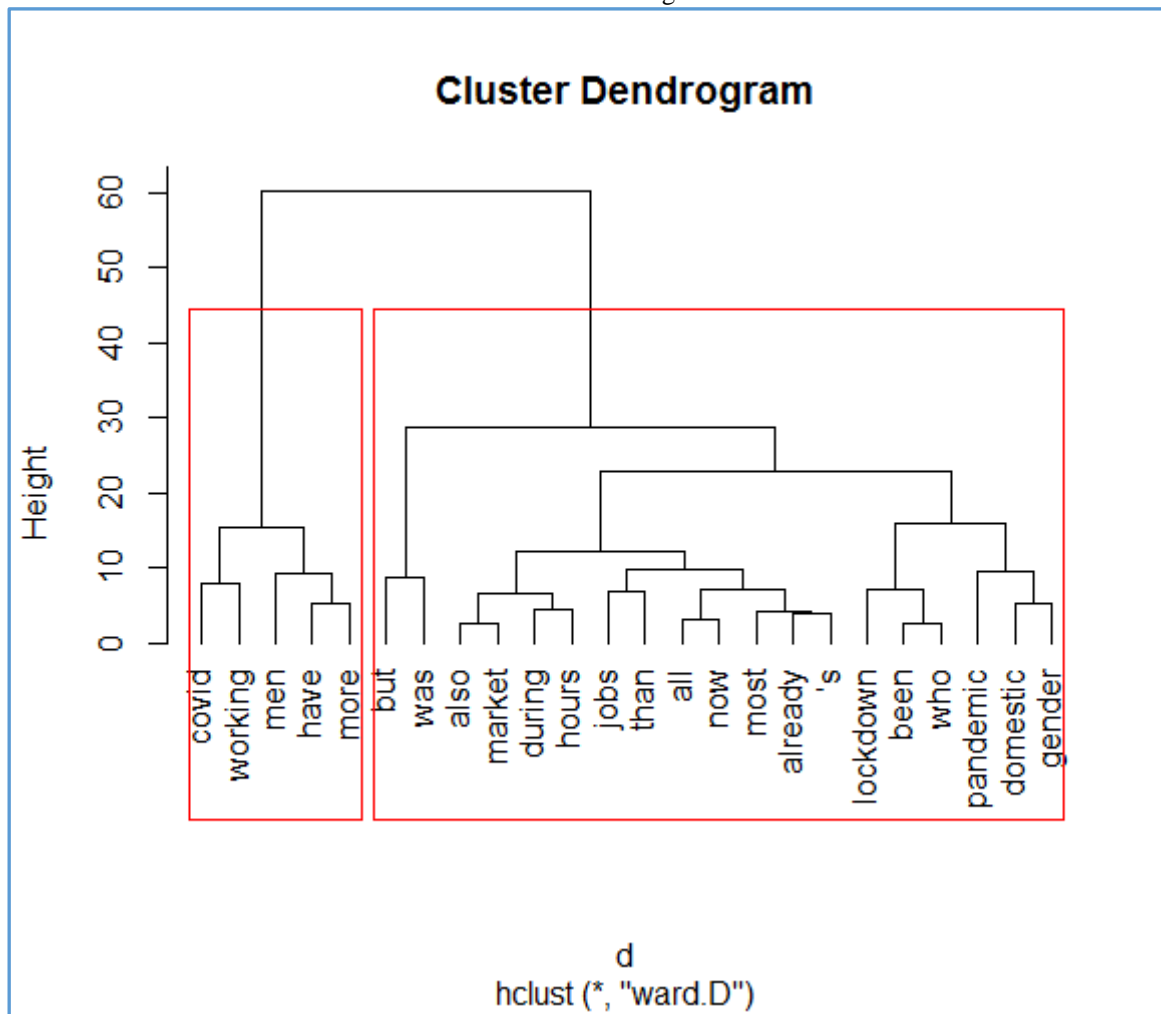
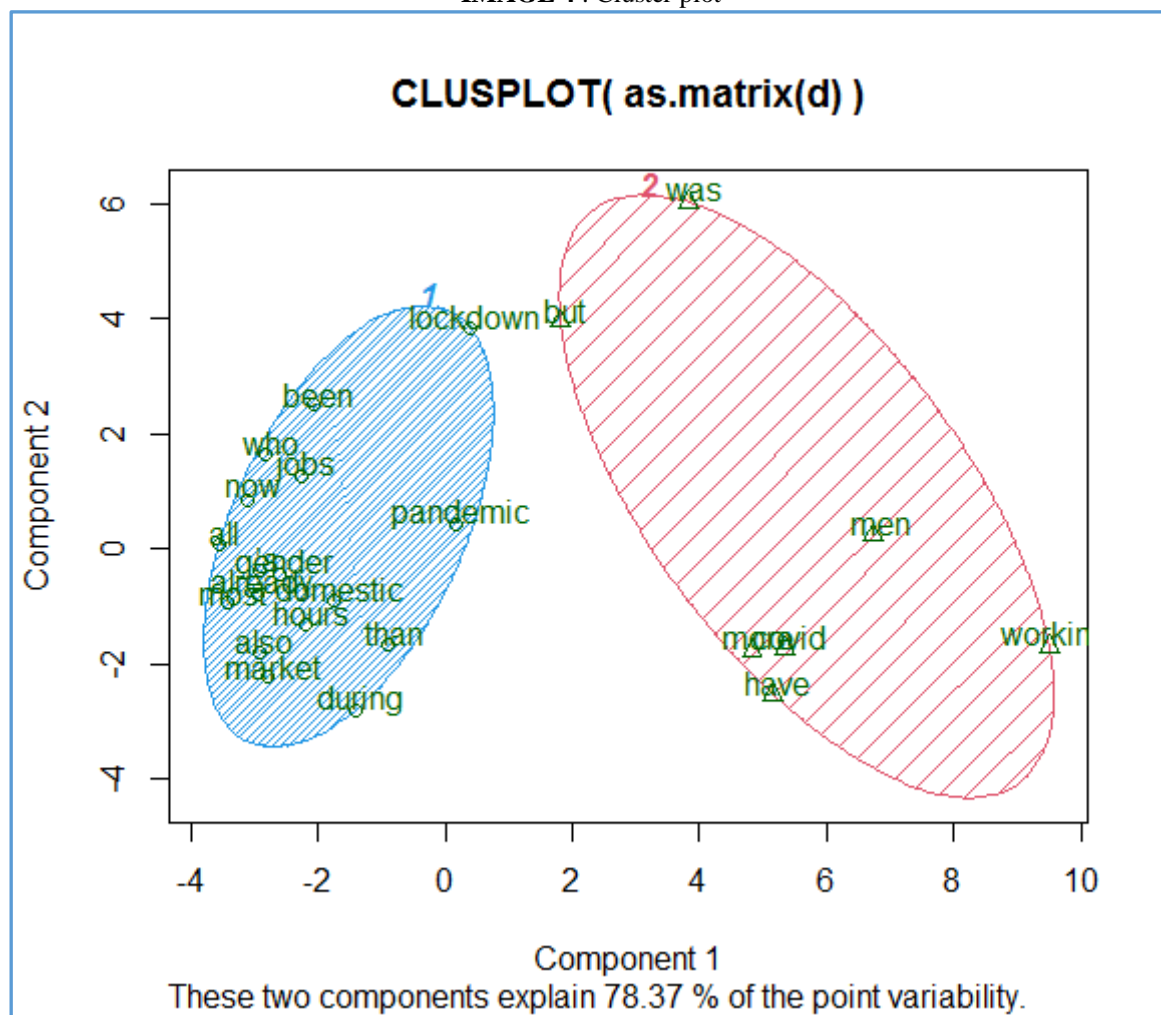


Image 4 shows the two cluster plot that explains 78.37% of point variability. The authors have attempted to study by including 3 or more clusters. They have concluded that there is no additional tangible outcome beyond the 2 cluster plot that can be documented.

In Image 4, the cluster 1 can be explained for covid creating more disruption in working schedules at the work front for men compared to pre covid times. Before stating the outcome, the authors have experimented by inclusion of the term “women” in the analysis. However, the outcome remains the same.

Cluster 2 represents that during the lockdown period of the pandemic, irrespective of gender, people have spent hours on domestic work. This work is either part of unpaid housework or childcare that has now been added to the responsibility set of the members of the household.

IMAGE 4 : Cluster plot



V. Discussion

It is seen from the results obtained that the articles written by the experts have stressed upon the fact that covid-19 has impacted the life of working professionals, both men and women, such that roles and responsibilities have been divided between domestic work and office. There is an emphasis in few articles laid on unequal division of housework, where women take up more of unpaid domestic chores while men prefer childcare. This has however, not surfaced explicitly in our findings. One of the reason could be the small sample size taken for this exploratory study. However, the 2 clusters indicate an important finding that men have along with women faced the brunt of turbulence at their workplace and additionally irrespective of gender, both have contributed towards domestic responsibilities during pandemic.

VI. Conclusion

The exploratory study conducted by the authors provides a research idea for further exploration. Recent research on this topic has been conducted in various geographies, with isolated findings. It will be interesting to study how nuclear families have coped during the pandemic in different parts of the world maintaining a healthy work-life balance in various professions, various geographies, varied demographics. Additionally, what kind of household responsibilities are best suited for the gender and the possible reasons for the same.

References

- [1]. Sofer, C., Thibout, C. (2019). Women's investment in career and the household division of labour. *Applied Economics*, Vol 51, Issue 60, p6535-6557.
- [2]. Rukmini, S. (2020, August 01). "Can Covid-19 change the work culture at home for men and women?". Retrieved from <https://www.livemint.com/mint-lounge/features/covid-and-the-working-woman-11596192757976.html>
- [3]. Anand, S., Sharmishtha, N. (2020, May 01). "Post Covid-19 for women in work: Perspectives from India". Retrieved from <https://feminisminindia.com/2020/05/01/post-covid-19-women-work-india/>
- [4]. Lavietes, M. (2020, July 06). "Covid-19 could wipe out gains in equality for women at work – U.N." Retrieved from <https://www.weforum.org/agenda/2020/07/u-n-warns-covid-19-could-wipe-out-gains-in-equality-for-women-at-work/>

- [5]. Uchoe, P. (2020, July 14). "Coronavirus – Will women have to work harder after the pandemic?". Retrieved from <https://www.bbc.com/news/business-53363253>
- [6]. Boca, D., Oggero, N., Profeta, P., Rossi, M. (2020, June 19). "Women's work, housework and childcare before and during Covid-19". Retrieved from <https://voxeu.org/article/women-s-work-housework-and-childcare-and-during-covid-19>
- [7]. Prakash, S. (2020, June 17). "Covid pushed women back decades. India can't be 'atmanirbhar' without bailing them out". Retrieved from <https://theprint.in/opinion/india-cant-be-atmanirbhar-without-bailing-women-out/442894/>
- [8]. PYMNTs. (2020, June 10). "eCommerce helps women hard hit by India's shutdown". Retrieved from <https://www.pymnts.com/news/international/2020/indias-covid-19-shutdowns-are-especially-hitting-women-but-ecommerce-can-help/>

XXXXXXXX. "Text Mining Outcomes: Redefined Role of Working Women/Men During Pandemic 2020." *IOSR Journal of Business and Management (IOSR-JBM)*, 23(08), 2021, pp. 39-46