

MSIS 670
BUSINESS INTELLIGENCE

MENTAL HEALTH IN TECH INDUSTRY

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1. DATASET DESCRIPTION

1.1 What is your dataset about ?

The dataset that we chose is a mental health survey conducted in 2016 by OPEN SOURCING MENTAL ILLNESS, LTD to measure the attitude towards mental health and the frequency towards mental health disorders in the tech workplace. We found this on the website Kaggle. This dataset consists of 63 questions (attributes), each covering a different aspect of the industry. The data has about 1400 records, which is about the average number of employees in a tech company. The dataset is the most recent survey after the 2014 survey which had similar questions. The link for the dataset is : <https://www.kaggle.com/datasets/osmi/mental-health-in-tech-2016>

Description of variables in the dataset :

The data consists of 63 questions which were the attributes to our dataset and about 1146 responses or rows. The dataset consisted of strings and long sentences as responses and not many numbers.

Some of the questions from dataset are mentioned below :-

- Does your employer provide mental health benefits as part of healthcare coverage?
- Do you know the options for mental health care available under your employer-provided coverage?
- Has your employer ever formally discussed mental health (for example, as part of a wellness campaign or other official communication)?
- Does your employer offer resources to learn more about mental health concerns and options for seeking help?
- Is your anonymity protected if you choose to take advantage of mental health or substance abuse treatment resources provided by your employer?
- If a mental health issue prompted you to request a medical leave from work, asking for that leave would be:
- Do you think that discussing a mental health disorder with your employer would have negative consequences?
- Do you think that discussing a physical health issue with your employer would have negative consequences?

1.2 Why did you choose this dataset ?

The data was rich with sixty-three fields and thousands of entries, facilitating complex calculations and visualizations. The dataset that we are currently using was the most updated survey conducted. Since mental health is a very important topic for the current society where each one of us unknowingly suffers from something that can be cured but we are just too scared to share it with the world. Normalizing mental health in different sectors of our world is very

important and we decided to give a little of our contribution using this survey. We are aiming to garner the attention of Tech companies with the help of this analysis. Through the analysis, tech companies will be able to observe principal causes of mental illness. Furthermore, the organizations will also be able to help out their employees by reforming their health policies. Henceforth, the employees struggling with mental health would be able to confide about their situation, which eventually would result in improvement of performances and growth of the organization. The target audiences are top management of tech companies and HR managers who can make the decision or change the organization's policies.

We all as students will join an industry and this analysis gives us a picture of how the world is dealing with a mental health patient.

1.3 Where did you get this dataset from ?

The dataset was acquired from “Kaggle”. The dataset consists of 63 columns with survey questions.

Dataset URL: <https://www.kaggle.com/datasets/osmi/mental-health-in-tech-2016>

The uniqueness of this data is that this is from a very renowned organization OPEN SOURCING MENTAL ILLNESS, LTD (OSMI) who conducts surveys like these to help companies understand the overall environment and help the organizations take a step towards improving the current ignorance of mental health issues. There are two surveys available online; 2014 and 2016. We decided to go with the survey conducted in 2016 since it was the most recent one.

1.4 What challenges did you face while dealing with the data ?

Although the dataset was consistent, it did not consist of many numbers and this was the biggest challenge. Since this was a survey, all the responses were strings that are difficult to process and analyze. However, we did our analyzes comfortably using the dataset in hand. The insights that we provided cannot completely justify the questions as not a lot of people considered answering every question. It should be noted that this is an online survey, it may be prone to voluntary response bias and may cause over representation of data. Keeping the above limitations in mind and being cautious with our interpretations, we can still use the data to gain some insight into the state of mental health in the tech workplace.

2. Storytelling by Data Visualization (using Tableau)

2.1 What are the main questions and their sub-questions ?

Question 1:

Main Question: Does working remotely or at the office location affect the mental health of an employee?

Sub Questions:

- A. How does productivity associated with the mental health issues in employees vary with the location of work (remote or office)?
- B. Who is likely to suffer from mental health; a remote working employee or an office-going employee?
- C. Should employees be given the liberty to choose to work in a hybrid setting?

Question 2:

Main Question: How does the work culture affect the mental health of an employee?

Sub Questions:

- A. How does the relationship between co-workers affect the mental health of the employees and what position/role has the most mentally affected employees? Does increasing pressure affect the productivity of employees?
- B. How difficult is the process of taking a leave for a mental health issue based on gender?
- C. How can the overall employee relationship be improved in the tech industry?

Question 3 :

Main Question: How serious is the organization when it comes to mental health awareness?

Sub Questions:

- A. Does anonymity increase the reporting of mental health symptoms based on geographical regions ?
- B. What is the relationship between physical conditions and mental health of employees?
- C. What current policies can be enhanced in order to improve mental health issues?

3. Visualizations and their Interpretations

3.1 Visualizations for the first question and their interpretations (findings)

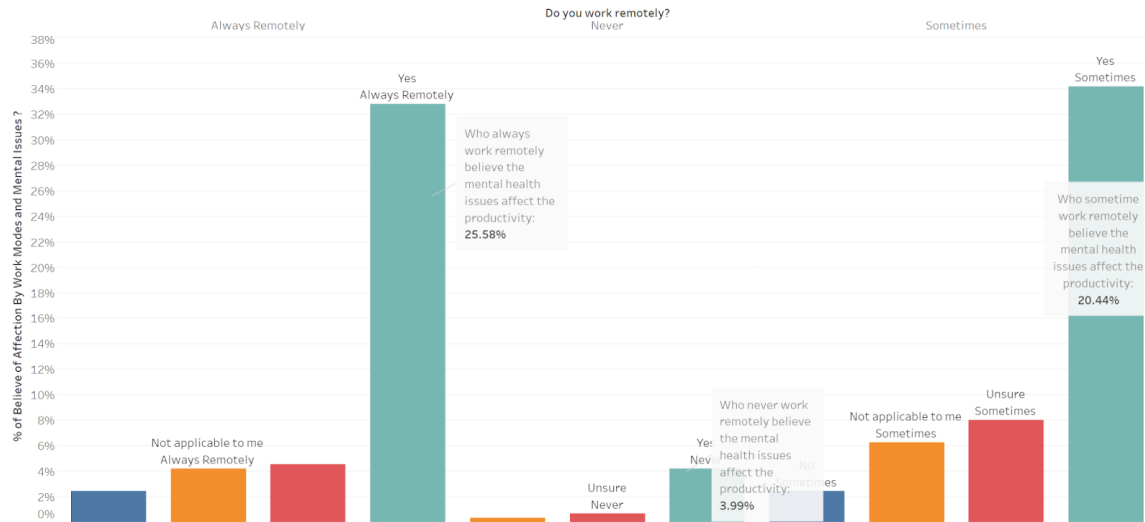


Figure 1.1

In Figure 1.1, the bar chart compared employees' opinions about affection for productivity associated with mental health by different work modes. The employees are grouped by their work modes, always on-office, complete remotely, or a hybrid setting.

$25.58\% + 3.99\% + 20.44\% = 50.01\%$ of the employees who took the survey did agree mental health issues affect productivity regardless of their work modes.

Meanwhile, the blue bars are the smallest bars which represent the smallest portion of employees who thought mental health issues don't affect productivity. No blue bar represents those who never work remotely and thought the mental health issues would affect productivity. In other words, all employees who were working completely on-office thought the mental health issues do affect productivity.

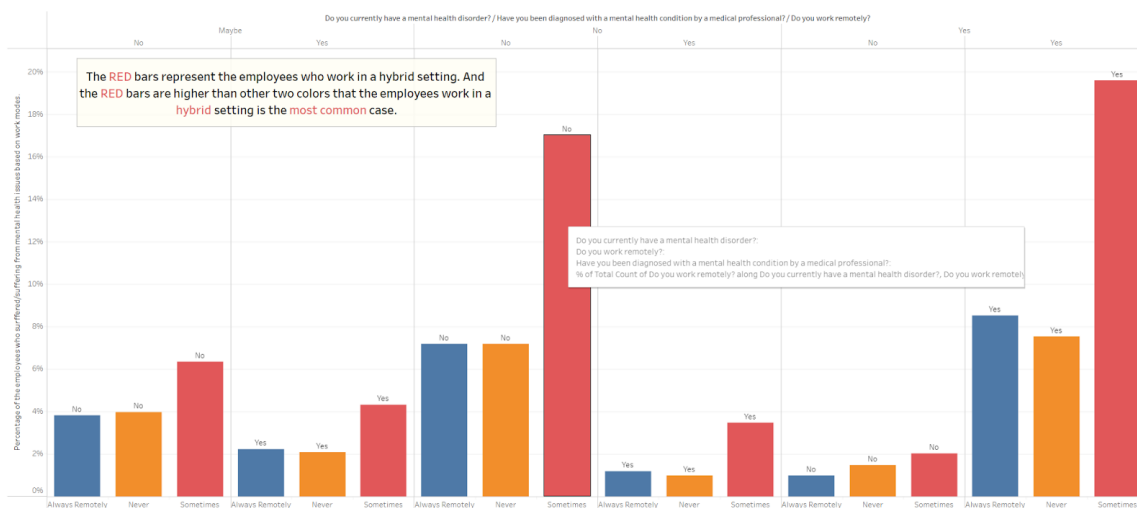


Figure 1.2

In Figure 1.2, the bar chart states the employees' current and past mental health issues by different work modes. The red bars represent the employees who were working in a hybrid setting. And the red bars are higher than the other two colors, which means the employees work in a hybrid setting is the most common case.

In Figure 1.3, the bars represent which group are the most likely to suffer or suffered from mental health issues. The red bars are still the highest, which means the employees who were working in a hybrid setting are the most likely group suffering or suffered from mental health issues.

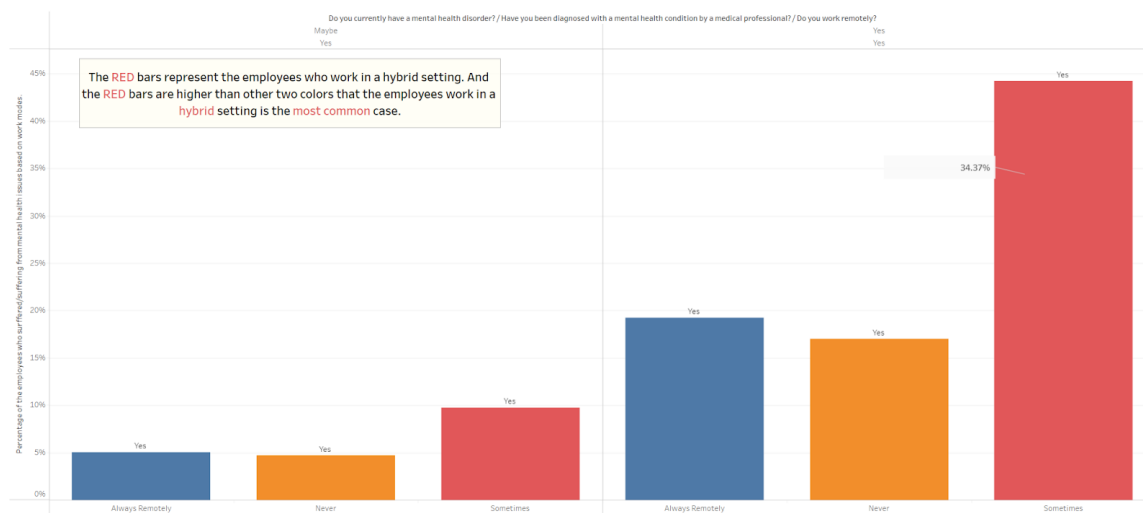


Figure 1.3

However, the Figure 1.4 shows an interesting fact, the employees who were working in a hybrid setting are the group the most likely suffering/suffered and NOT suffering/ suffered the mental health issues at the same time.

The employees work in a hybrid setting are the most like suffering/suffered mental health issues.: 19.61%

The employees work in a hybrid setting are the most like NOT suffering/suffered mental health issues.: 17.03%

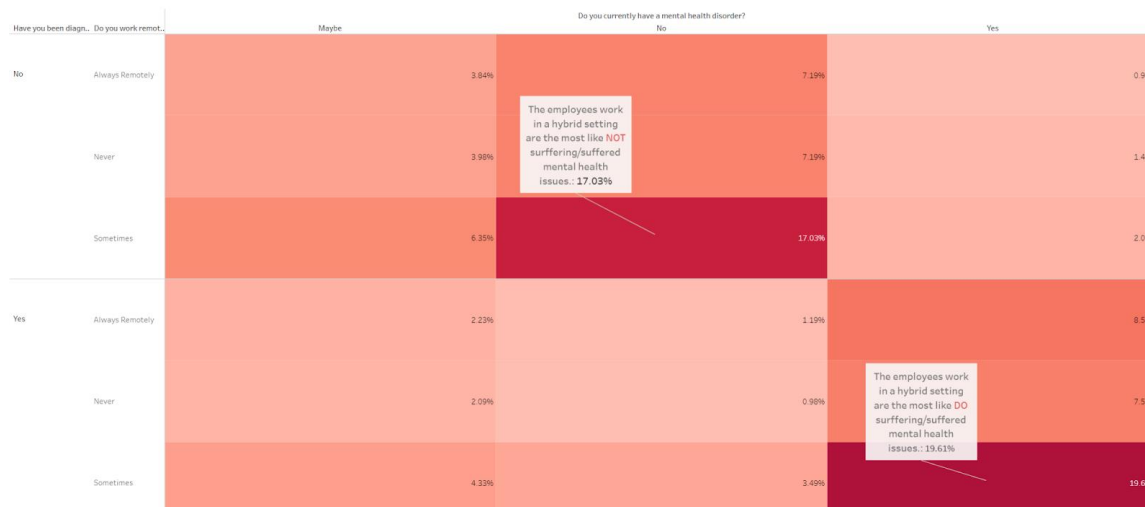


Figure 1.4

The employees who were working in a hybrid setting are the largest group and the most likely suffering/suffered from mental issues. But meanwhile, they believe mental health issues do affect productivity. They might already choose to work in a hybrid setting because they have or had mental health issues, and they wanted to reduce the affection of productivity from mental health issues. Hence, the employees should be given the liberty to choose to work in a hybrid setting.

3.2 Visualizations for the second question and their interpretations (findings)

The work culture of an organization can be analyzed by the relationship between the employees and relationships between the employees and their “bosses”. It also can be studied by a simple process of applying for a leave. This angle was used to observe if the organization took leaves taken for under the reason of mental illness seriously. It can also be understood using gender distribution and the way mental health is perceived for both men and women. To explain this further we can now check out the analysis on the following questions:

To answer the question, it was very important to first know what percentage of the employees were suffering from or diagnosed with any kind of mental illness.\

Diagnosed percentage

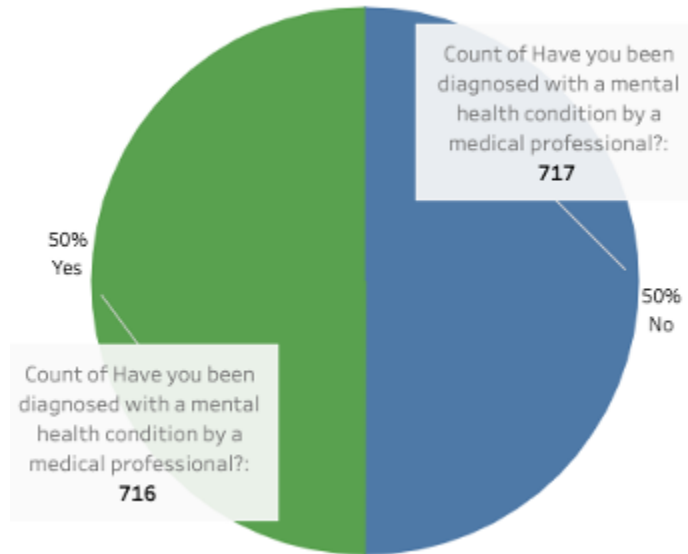


Figure 2.1

The results for the same were surprising. It was observed that there were about 50% of out of the 1146 employees who were diagnosed to have mental illness. This tells us that every second employee of the organization is suffering from a mental disorder.

Now to understand why there were 50% employees suffering, there are other relevant attributes that could be considered. For instance, the gender distribution in the organization.

Male - Female

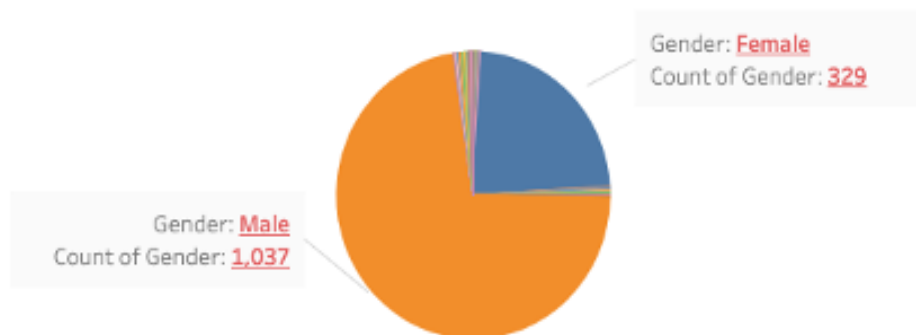


Figure 2.2

Like any other organization, the number of female employees was less than male. However, this did not end the investigation. To understand any kind of biasness, the leave application process was considered.

The figure 2.2 tells us about how to apply for leave variously based on your gender and if you have been diagnosed or not.

By normalizing all the different genders mentioned in the dataset, the main genders; male and female are considered. About 25 females out of 151 and 44 males out of 315 employees that suffer from mental illness found the leave application process to be very difficult. The leave application process was seen to be a very easy process for most of the employees that have been diagnosed. This shows that the organization is taking mental health seriously and allows their employees to be able to take some time off for a mental health reason.

Leave application process for various genders

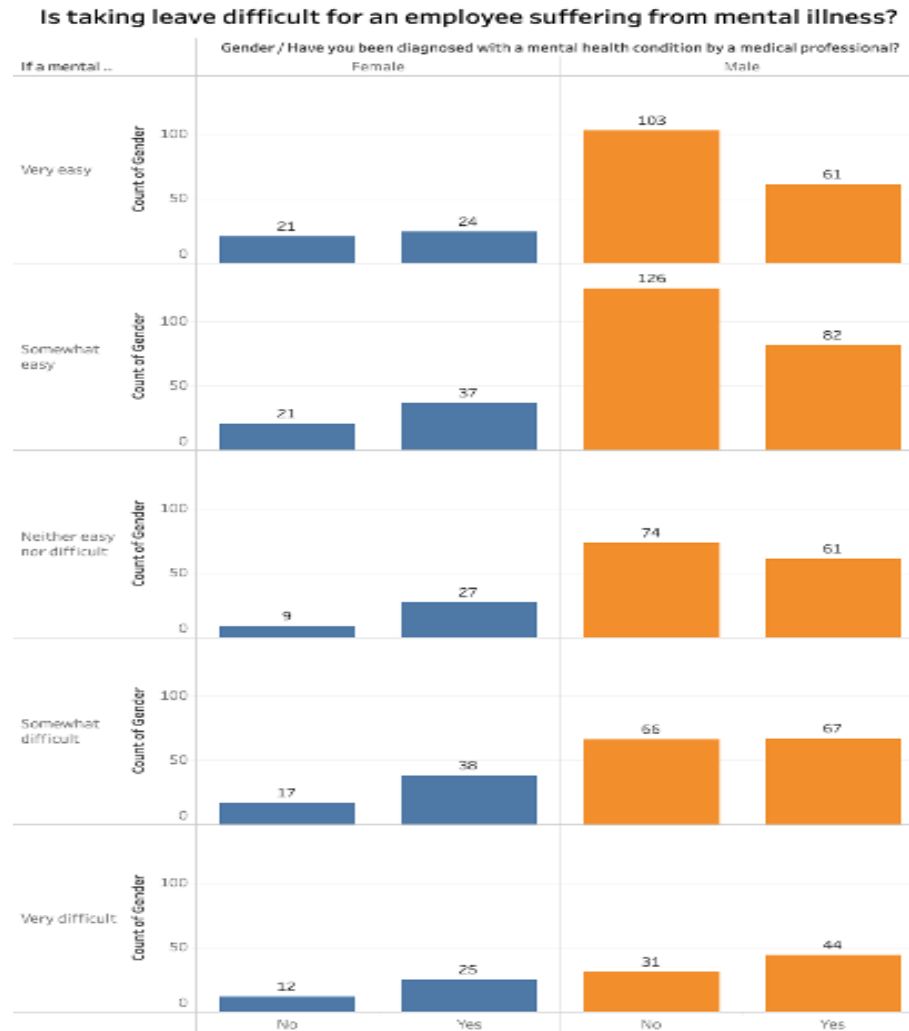


Figure 2.3

Next, we extended the analysis to the hierarchy and the relationships between various positions within the company. It is a common understanding that an employee with a higher position and more responsibilities would be prone to experiencing stress and depression. However, the results show a completely contradicting statistic.

Diagnosis based on the position at the organization

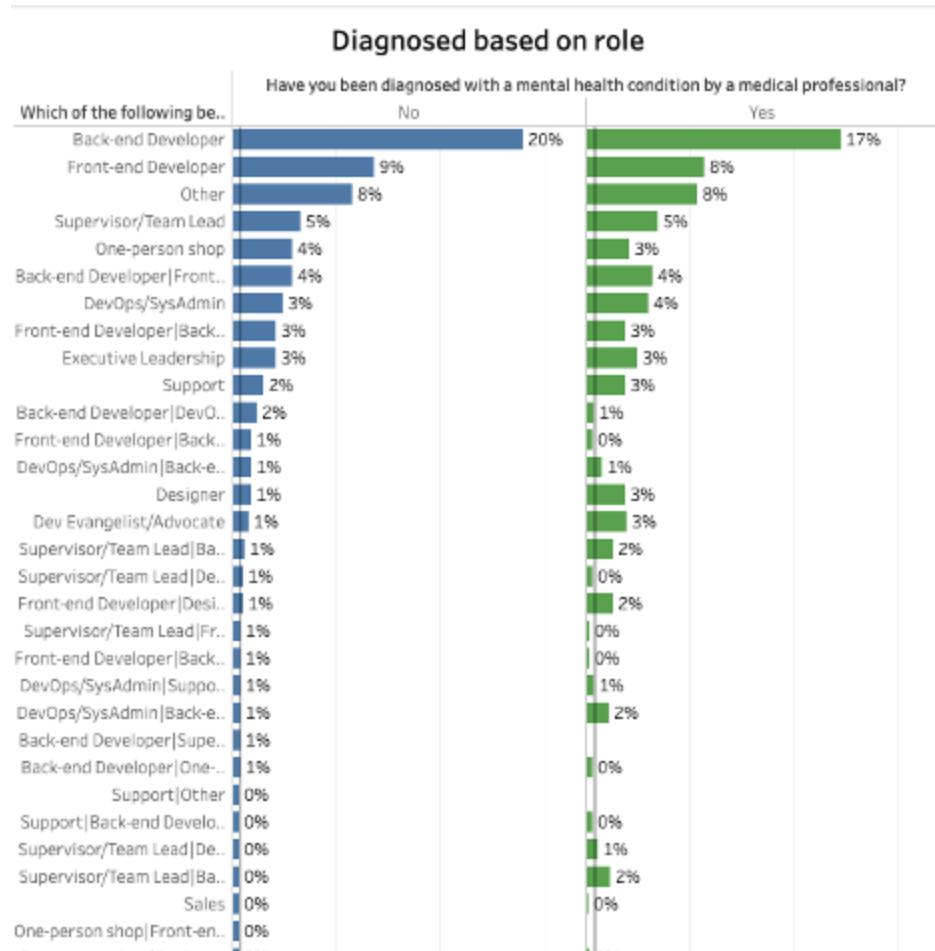


Figure 2.4

The above graphs show how an employee who is only a backend developer is highest for both diagnosed and not diagnosed. Out of the 50% diagnosed employees, there are 17% backend developers. The graph also shows that an employee who is under the role “Executive Leadership” contributes to 3% of the number of employees that said “Yes” to being diagnosed professionally. This could be because of the low number of people under that role. This does not clearly explain if being in a higher position does affect your productivity.

To get into more debt and actually find out the work culture of the organization, the productivity of employees was questioned.

Is productivity being affected by mental illness?

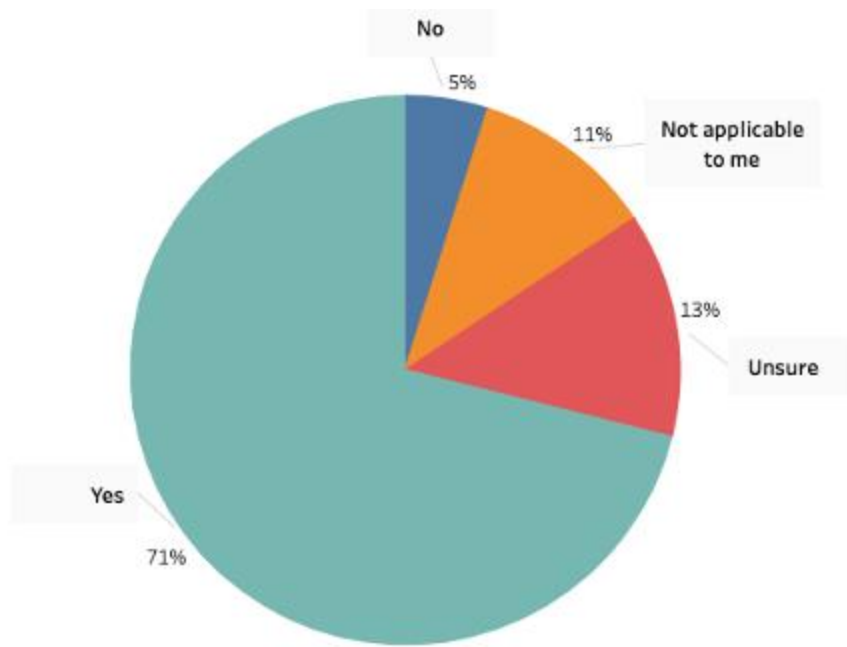


Figure 2.5

The response to this question was fairly “Yes”.

Mental health affecting career

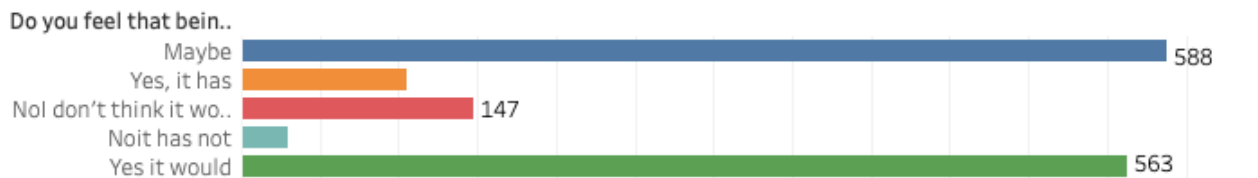


Figure 2.6

The above graph shows out of 1433 responses, about 563 have said that it does. The analysis was then concentrated towards the communication and reaction to sharing any mental illness news. It is very important to know how an organization handles this kind of information and if the employees are comfortable enough to share this with their coworkers or supervisors.

Comfortable sharing with coworkers or supervisors?

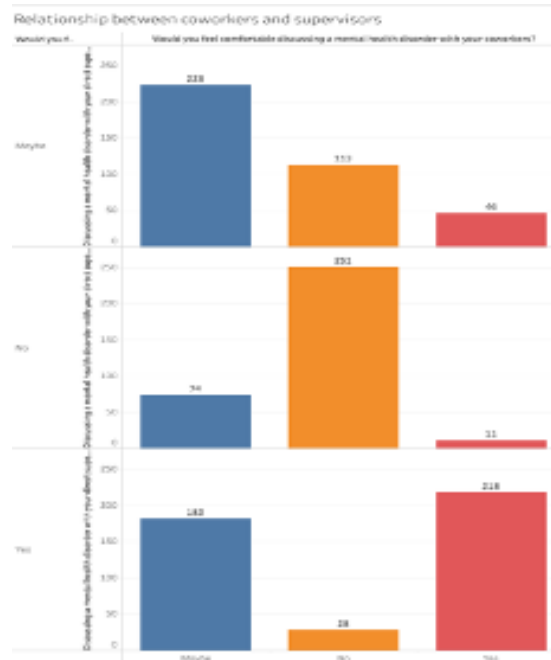


Figure 2.7

The analysis shows that out of the 336 responses for “No” to supervisors, only 11 are comfortable sharing it with their coworkers. Also, out of 275 responses for “Yes” to coworkers, 218 have said “Yes” to sharing the news with their supervisors also. This means that there is some kind of comfort that the employees are experiencing in sharing the news with their supervisors than their coworkers. There are about 251 employees that do not want to share it with either.

The next graph shows how the employees think that this will affect them negatively.

Upon understanding this a little further, of the 251 responses that said “No” to both coworkers and supervisors, 121 have said “Yes” to it being negatively impacting them. This also tells us that many are scared to share it since this could be the reason other employees start treating them differently. Since this is a survey, there is no way to be sure of a certain reason, but this can be a possibility.

Does sharing have negative consequences?

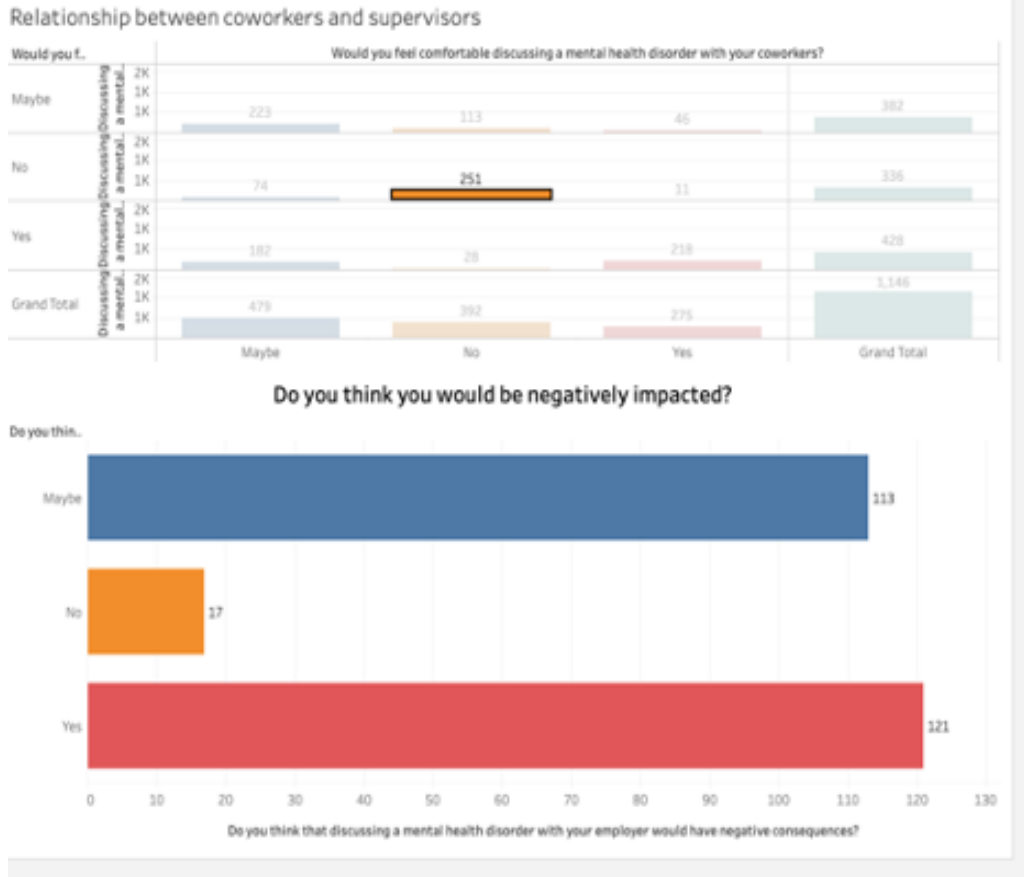


Figure 2.8

This entire analysis gives us the idea of how mental health is seen in a company of thousands of employees and how a person suffering from mental illness is scared or still not comfortable enough to be open about their illness or even consider being diagnosed.

3.3 Visualizations for the third question and their interpretations (findings)

The Fig 3.1, shows the countries where the employees work in who are surveyed for the mental health disorder.



Fig 3.1

The following Fig 3.2, gives us the number of employees who have opened up about their mental health illness in the organization and have their anonymities protected. As it is visible quite a few people do not have their anonymities protected and more than 50% of people are not sure about it. There are 320 employees (USA) in the organization who have their identities protected.

Is your Anonymity Protected ?

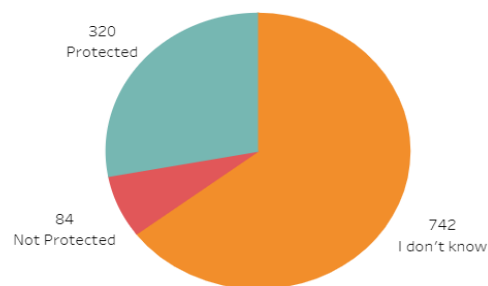


Fig 3.2

The Fig 3.3 shows the number of employees who have reported to a medical health professional in the organization. As the graph shows, there are higher numbers of people reporting in The United States Of America with a number of 716 out of 1146.

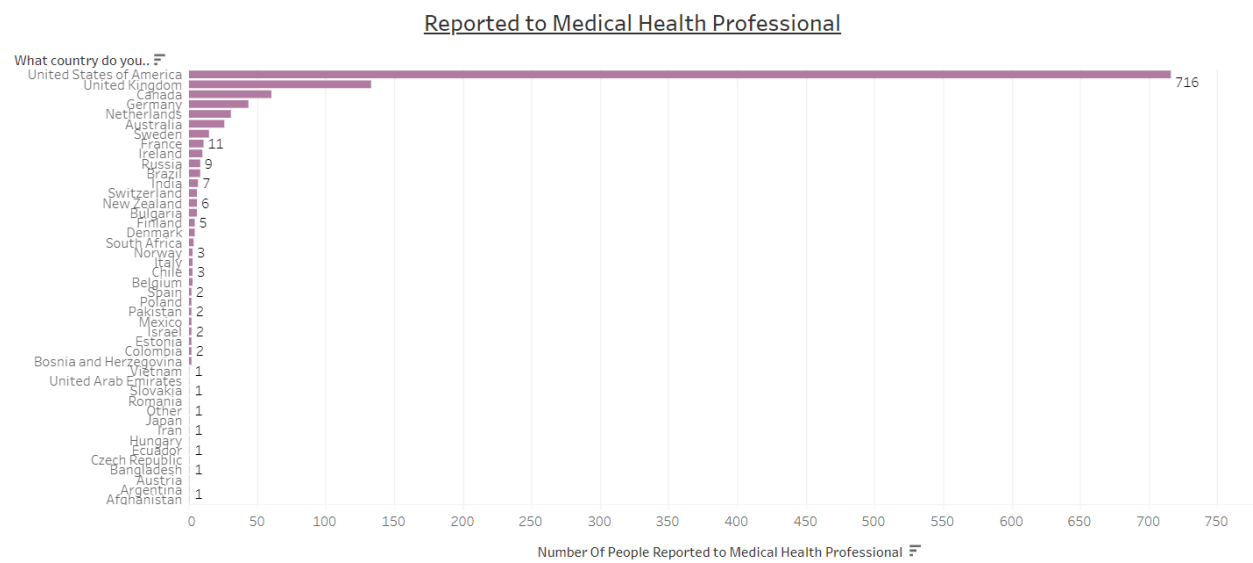


Fig 3.3

In general, it is believed that if the anonymities of the employees is protected for a particular region more employees would start reporting to a health professional in that region.

Physical Health vs Mental Health

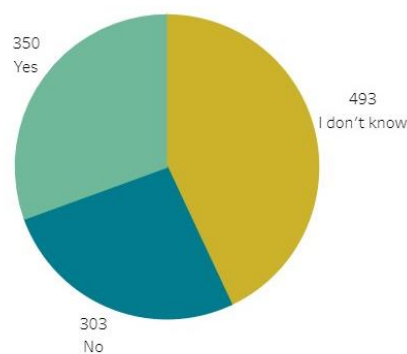


Fig 3.4

Fig 3.4, shows that 350 employers take mental health as seriously as physical health and there are 303 employees who believe that their employers do not take mental health seriously. These numbers are very close.

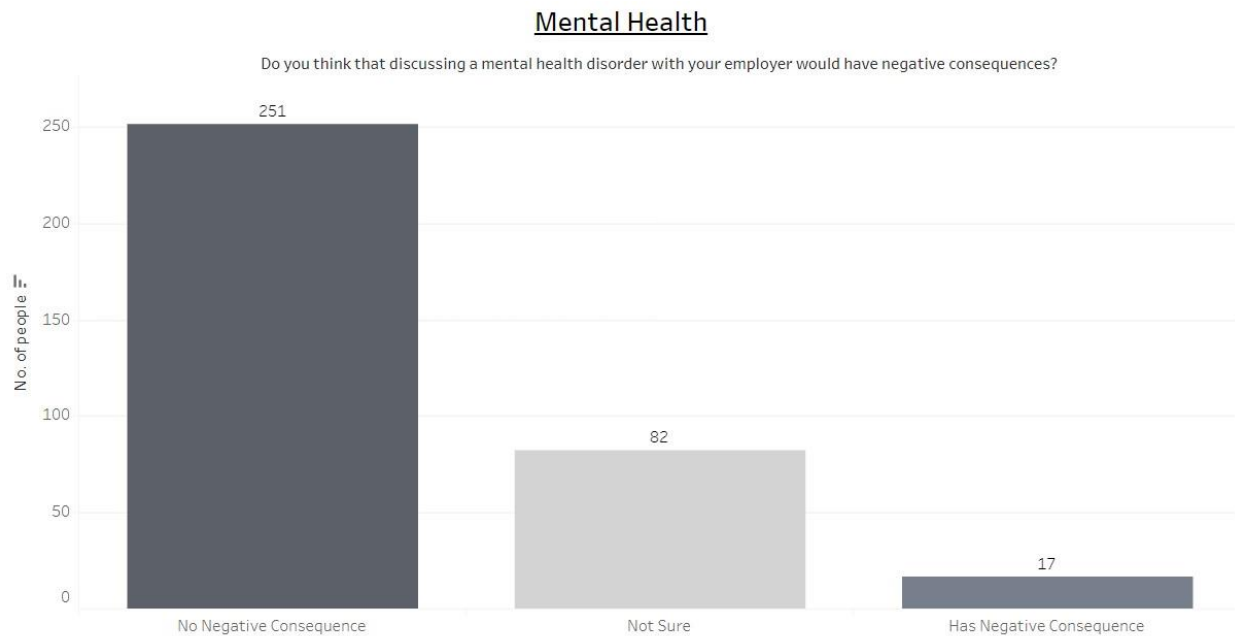


Fig 3.5

Fig 3.5 shows that 251 employees believe that there would be no negative consequences when they discuss mental health with their employer. Only a few people think that there would be negative consequences if they discuss.

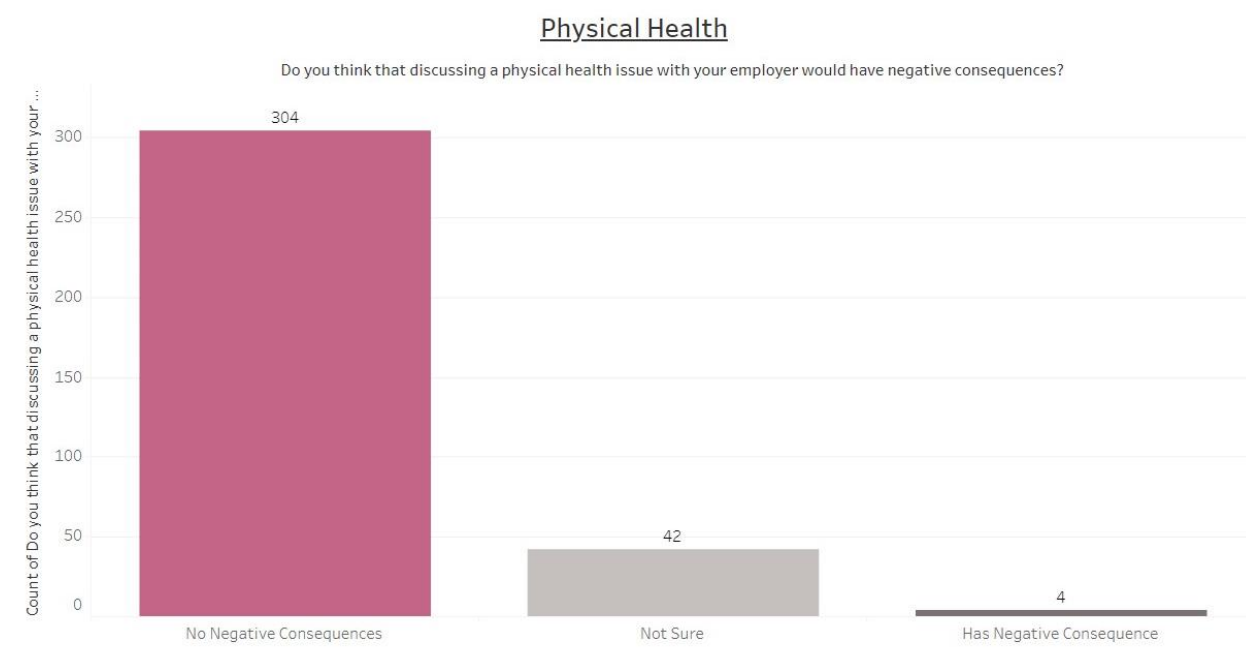


Fig 3.6

Fig 3.6 shows that 305 people believe there would be no negative consequence when they discuss their mental health.

The given Fig 3.7 proves that 50% employees believe that it is easier to ask for a leave when it is related to a mental health issue. These figures indicate that the current policies of the organizations easily enable them to ask for leaves. While some believe that it is difficult and others are not sure about it.

The organizations can improve their reforms to make it easier for their employees to open up and ask for leaves.

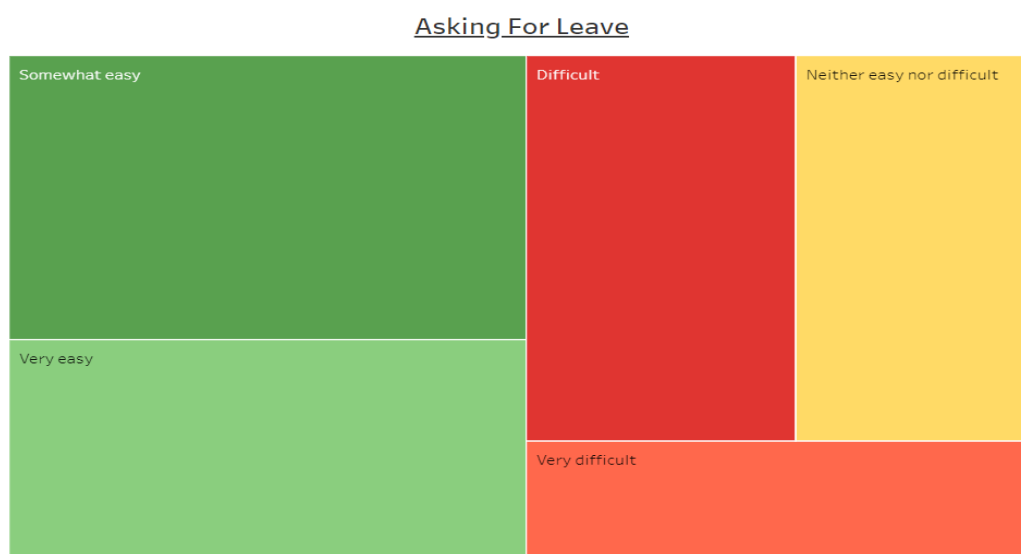


Fig 3.7

In the following Fig 3.8, almost 250 employees are receiving mental health benefits as part of the healthcare coverage and only a few employers do not provide such benefits. The number 164 defines those employees who are receiving the health benefits and they are aware of this fact. This also shows that more employers are becoming aware to talk about their mental health with their employees.

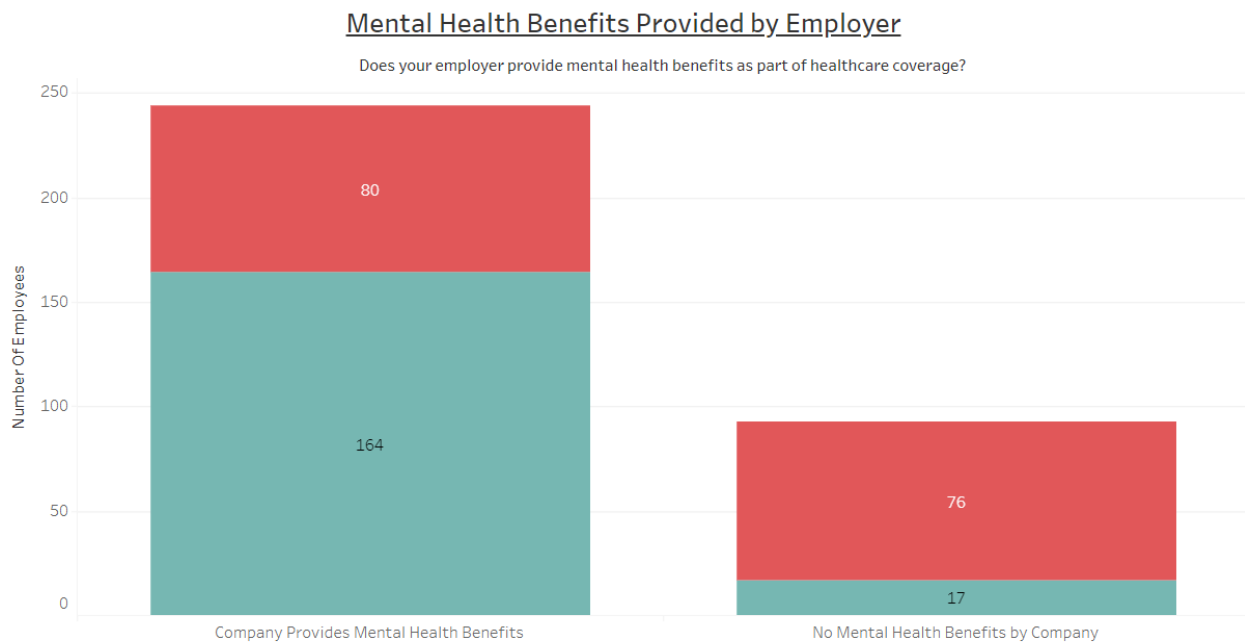


Fig 3.8

Fig 3.9, gives us the conclusion that a major chunk of employers does not have discussions about mental health with their employees.

Discussion about Mental Health By Employer

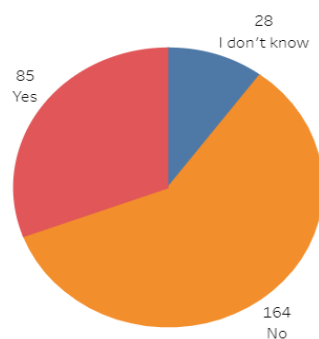


Fig 3.9

The yellow bar in Fig 3.10 shows that a lot of employees are not comfortable speaking about the mental health issues within the organization. The red bar defines those who are unsure about speaking their issues with the employers.

Employees suffering from mental health issues might shy away from discussing it if they feel it is not professional to talk about it at the workplace. So it is important that their employers provide them with a formal stage to discuss this.

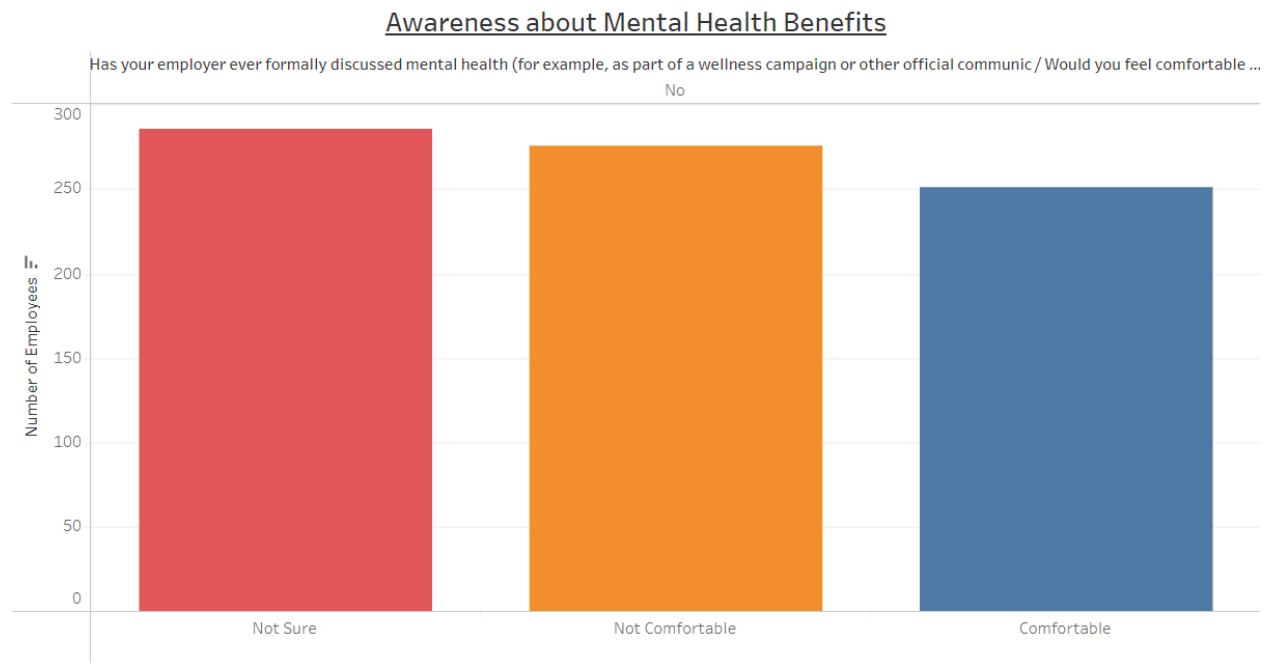


Fig 3.10

Studying the data helps us to analyze that having discussions with the employees and providing them with mental health care benefits would result in an increasing number of employees willing to talk about their mental health.

Such insights can also help the employees decide their next workplace.

5. Conclusion

4.1 Summary of the visuals and new insights found

Question 1 :

The graphs conclude that irrespective of the location of your workplace, the productivity is affected due a mental health issue. The purpose of this question was to understand if an employee when working from the comfort of their homes is affected by mental health. The graphs clearly show the all the modes of work; hybrid, complete remote or complete workplace are facing the same kind of issues relating to their mental health and productivity. Furthermore, it was understood that most of the employees who follow a hybrid setting to work are diagnosed with a mental health condition. It was also noticed that employees who previously suffered from mental health issues are now considering a hybrid setting to work. This could be the main reason why there is a higher number of people who are diagnosed with mental conditions to work in a hybrid setting.

Question 2 :

The relationship between the employees in the organizations seems to be a little difficult to understand. This is not because of less data, but because of many responses to some questions being “Maybe” or “I don’t know”. Since it’s a survey the employees are at liberty to write what they want to and hence we cannot make the assumption for anything. There are no biases based on gender as seen in the graphs.

The overall work culture could be improved by making mental health normal and making sure that an employee who is diagnosed is not looked upon differently.

Question 3 :

Protection of anonymity plays an important role in a way reporting of mental health issues to the professionals is affected. There has been an increase in the employers offering mental health support but there are employees not aware of this benefit. The visualization enables us to understand that more importance should be given to the discussion platforms so employees are willing to talk about it.

The most impactful observation was the availability of sick leave being easy. There is also a positive correlation between no perception of negative consequences with mental and physical health, which eventually suggests that workplaces that care about physical health also tend to care more about mental health too. These results are solid evidence for analyzing the entire system and adopting them would help in inducing a healthy and welcoming workplace.

4.2 What did you learn about data visualization concepts and lessons, especially to address the question ?

Tableau is a very versatile data visualization tool that is not just used for the generic structured data but can also be used for unstructured data like the dataset used for this report. It can help create any range of visualizations. The interactive dashboards and

storyboards make the visualization more appealing. You can apply a single filter to multiple sheets and this helps you analyze more than one attribute at one time. The use of interactive and informative dashboards was abundantly done for this report to get to the root cause of our questions.