Fuzzy Regression: A New Model Data Analysis for Post-COVID-19 Affected Persons

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Abstract: The purpose of this work is to analyse the post covid 19 effects experienced by the employees in connection with their family experiencing the interrelation between the work-family conflict and Family feuds which includes the entire satisfaction in their life along with organisational support and organizational commitment. The statistical analysis was done by making 200 employees of a cashew factory to participate in the analysis by conducting the relational survey model. The data analysis was done using the information collected by online questionaries and by doing T-test, F-test, and Deep Canonical Correlation Analysis (DCCA) along with the analysis done using the Fuzzy Regression model (FRM). The data needed for the analysis was gathered using Questionnaire, Job Nature scale, work family and family work conflict scale etc for finding the connection between the Nature of job and job satisfaction. A fuzzy regression model is implied for evaluating the functional connection between the independent variables in the fuzzy based environment. It also focuses on the roles played on organizational commitment by maintaining the connection between the organisational support and the Family feuds. The results proves that the women employees are suffering more due to post-COVID-19 effects than male employees in consideration with the psychological dimensions. The obtaining results supports the policymakers of industries to develop the various strategies which will minimize the effects of post covid 19 effects for creating efficient and sustainable employee performance.

Keywords: work-family conflict; post covid 19 effects; organizational commitment; organizational support; Fuzzy Regression model.

1.   Introduction

The 2019 coronavirus disease outbreak in the lungs is suspected of being caused by the SARS-CoV-2 virus (COVID-19). After Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS), this is thought to be the third coronavirus epidemic (MERS). The global population's health is already in jeopardy, and this will only worsen in the future. People who come into close proximity with an infected person or have direct contact with them are at risk of contracting COVID-19, which spreads through the respiratory system[1]. After being discovered in Wuhan, China, the COVID-19 pandemic quickly spread around the world, posing an immediate and grave threat to people's health everywhere. In late 2019, a global pandemic broke out. On March 11, 2020, the World Health Organization (WHO) said that COVID-19 was a global pandemic. The World Health Organization (WHO) came to this conclusion after analysing the speed at which the virus spread, how dangerous it was to human health, the number of countries that were affected, and how the number of reported cases appeared to be increasing at an exponential rate. Almost every nation on Earth has implemented strict measures in response to the extraordinary crisis brought on by COVID-19 to slow the virus's rapid spread and lower the

number of people who fall ill and die from it. Common preventative measures included restricting movement, locking down and instituting curfews, isolating individuals, and erecting barriers between people. People also had to use hand sanitizer and put on masks. As a result of the COVID-19 virus and the measures taken to combat it, the daily lives of people in several countries have been drastically altered. Vaccinations and other forms of preventative care fall under this category. Billions of people worldwide have complained of difficulties in their personal and professional lives since the first case of COVID-19 was reported[3]. As a direct result of the government's inability to stop the pandemic, many people have experienced fear, uncertainty, and anxiety. Concern for one's own health, the health of others, and the health of those closest to one's heart became widespread. They feared both immediate and long-term consequences to their careers and employment. Predictions in the short term were hampered by the dangerous and largely uncontrollable chain of events that led to the COVID-19 outbreak. Several events related to the pandemic and its effects directly resulted from this[4]. Anxiety and fear are normal responses to a global pandemic, and it is important to understand how people cope with these emotions so that we can better support them as the crisis unfolds and as measures are put in place to deal with the pandemic as a whole. A pandemic is defined as an event with the potential to spread all over the world[5]. People's habits and routines, which were developed over hundreds of

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years, have undergone major changes in a short amount of time since the start of the COVID-19 pandemic. The "new normal" describes the current state of affairs as a direct result of these shifts. One of the most devastating events in modern human history, the COVID-19 pandemic was first assessed from the medical community's perspective. Over time, it became apparent that the pandemic's effects were felt on more than just a psychological level. Most people believe that the pandemic was one of the worst things to ever happen to humanity[6]. There is no denying that the COVID-19 pandemic has affected people's psychological well-being in addition to having disastrous medical and economic repercussions. Various studies, including scholarly ones have confirmed this[7]. Negative social and occupational outcomes are additional results. There has also been an increase in fatalities that experts attribute to the pandemic. Numerous new scientific papers are being published daily due to the ongoing efforts to comprehend the medical facet of COVID-19 and develop treatments for it. Research into the mental health consequences of the pandemic has also increased dramatically since then[8]. Like many other countries, Turkey's government ordered the widespread use of facemasks and instituted other measures, such as social isolation and lockdowns, to reduce the number of confirmed cases and deaths. The goal was to stop the disease from spreading further. However, these limitations affect nearly everyone's daily life, so stress and anxiety disorders have become more common. Many people feel unfavorable emotions like anxiety and fear because the pandemic has made their lives significantly less predictable[9]. Workers were surprised to learn they needed to work from home or adjust to more flexible working hours and conditions during the COVID-19 pandemic. As a direct result of the rapid social transformations brought about by COVID-19, the line between an individual's personal and professional lives has blurred[10]. Since they had nowhere else to work, people without proper home or workplace offices set up makeshift offices in their living rooms, kitchens, and bedrooms. This was the case for many parents all over the world who tried working from home during their kids' summer vacations so they could both keep their jobs and be there for their kids[11]. They were able to keep their jobs and keep making money as a result of this. Many workers' productivity and motivation plummeted after these changes suddenly sprung on them. The conditions in which they were forced to work increased their stress levels, which harmed their mental health that often persists to this day. As a direct response to the COVID-19 pandemic, online virtual classrooms quickly replaced traditional face-to-face classroom instruction[12]. The teachers were given an urgent order to quickly adjust to the new classroom environment, which included

incorporating online instructional strategies. The significant ambiguity over what should be taught and how it should be delivered during this period affected both students and educators. The evolution of the teaching process is accompanied by a greater degree of uncertainty as a result of recent changes in teaching methods and the lack of clear guidelines for how these new methods should be implemented[13]. Teachers at all levels are being pressured to adopt online pedagogies and move quickly to adapt classroom materials for the digital age. This is being done so that students can keep going to school even if the epidemic spreads. Teachers and students alike were expected to learn how to use the various forms of online software used in distance learning. As a result of these developments, educators at all levels have far more responsibility than they did in the past. Due to the COVID-19 pandemic, numerous changes have occurred in the academic community[14]. Because of this, many educators are talking about feeling overwhelmed in the classroom. Many people have had to resume their education since the pandemic, but they can only do so by taking classes online[15]. This indicates that they have been thrust into a situation where they must quickly adapt to working conditions strikingly similar to those of a home office. This is a medical and financial crisis, but it has also revealed the mental toll the pandemic has taken on some educators. Teachers typically lack the tools for distance learning and have not received sufficient training on using digital resources and equipment[16]. Many rapid changes have occurred in the educational system during this adjustment period to the "new normal." The stress levels of educators are rising as a result of these causes. One of the simple steps in providing distance education online is making, tweaking, and publishing digital educational content. However, this procedure is more extensive and crucial than the one before it[17]. Some people's lack of familiarity with distance education and its function in the educational system has been noted during the uncertain aftermath of the pandemic. This is true despite online learning giving students more control over their schedules and subject matter. Students in a distance learning program do have more independence, responsibility, and options, but this statement still holds.

2. Related Works

Undoubtedly, during the pandemic, it was pointed out how close schools and families are, and it was suggested that schools' roles are even more important during times of crisis. But school administrators have to deal with a lot of hard situations, like the stress, anxiety, and fear that teachers felt during the COVID-19 pandemic[18]. Because the virus spread differently in each area, school administrators also had to deal with rules and procedures that were different from place to place. They also had to

think about how the pandemic affected the health of their employees, students, and their families, as well as how it changed their routines and how they worked. Due to the social distance rules for staff and students and the expectations that students, teachers, and students have put on educational leaders during this time, school leaders have had to take on more personal and professional responsibilities. Unlike other natural disasters like floods or earthquakes, the COVID-19 pandemic has made education more unpredictable[19]. This shows how important leadership is in these situations. Also on the rise are studies in academic institutions that look at leadership. Most COVID-19 research on school leadership, on the other hand, is theoretical or conceptual and tries to figure out how the pandemic is affecting schools. It is a first for empirical research to look at school leadership in the context of the COVID-19 pandemic and its effects on education management[20]. Given what the COVID-19 waves could do and what they could mean for education shortly, it is important to make suggestions for school leaders in these hard times. The way things now make this point even more important. Since the COVID-19 pandemic started, many school administrators have spent a lot of time trying to influence and talk to people through the screen of a laptop, computer or smartphone[21]. This is despite their main job being to run the school and ensure that teaching and learning go smoothly. Before, they had to spend a lot of time making sure the school ran smoothly and making sure the teaching was better. Due to the ongoing global crisis, there has been a change in the people in charge of schools, but the problems it has caused are still around. Administrators of schools must use a secure, principle-based, and collaborative management strategy to ensure that students can keep progressing toward a better future despite the pandemic[22]. Given the

critical leadership and coordination roles that school administrators play in helping their schools reach their goals, it is essential to look into how the pandemic is affecting them. In this situation, the relevant literature includes several studies on people that look into the possible psychological effects of COVID-19[23]. Even so, during these hard and essential times, no research has yet been published that looks at the fear school administrators felt during the COVID-19 period and how that fear affected their work-family/family-work conflicts and how happy they were with their lives[24]. Even though we are going through hard and dangerous times, this is the case. So, the main goal of this study is to find out how school administrators' fear of COVID-19 affects their work-family/family-work conflicts and their overall happiness.

3. Materials and Methods
3.1. Participants and Actions

In this work, the participants are workers from the cashew industry. Mostly they are female workers and some are male workers. The statistical analysis is held between the employees from the cashew industry in Panruti, Tamil nadu. How the post COVID 19 affects the employees in correlation with the conflicts arises between the family and the workplace and vice versa. The connection between the employees are under review. The effects due to COVID 19 in context with the work family and family work conflict was tested with different variables in correlation with organisational support and commitment. The investigation is carried out with 200 employees including the male and female workers with various posts. The sample questionnaire is collected with about 100% of the employees.

Table 1: Participated Employees in Analysis

Age Range	Males	Females
24-30	9	34
31-40	13	51
41-50	8	45
50-55	6	27
>55	4	3

The various scales used in these researches was analysed in deep manner. Before starting the research, the needed information and knowledge is shared between the employees. The Questionnaires were sent to the employees who involved in this research via printed documents and is made them to complete with in some hours. About 160 females and 40 males are participated in this analysis with different ages. The age range of the

employees are shown in table 1 given above. The senior personals who were working in the same organisation is too examined along with the low-level employees(Both Male and Female). Out of 200 participants , the male employees are about 4.5 % and they have the age range of 24 to 30 years, whereas 6.5% have 31 to 40 years of age. And females are about 25.5% having the age range of 31 to 40 %. This is illustrated in graph as given in Figure 1.
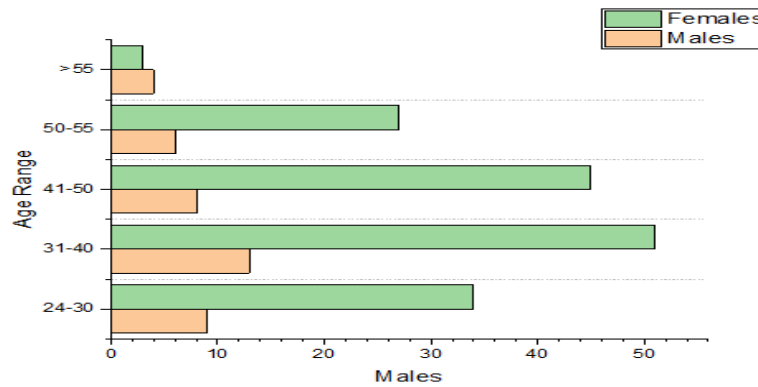
Fig 1: Graphical Representation showing male and female participants with different ages.

Most of the employees spotted here is the female employees and very less male employees are participated. According to the analysis, about 60% of the employees both male and females are got infected with COVID 19.

3.2.   Analysis of Data

For this analysis, six various scale pattern is used for data collection. They are

- Post Covid 19 Scale (PC19S)
- Work-Family conflict Scale (WFcS)
- Family Work Conflict Scale (FWcS)
- Life Satisfaction Scale(LsS)
- Organisational Support Scale(OsS)
- Organisational Commitment Scale (OcS)

A.   Post Covid 19 Scale (PC19S)

This scale is used for the fearness that gets created due to the covid virus effects. The scale points are taken under various categories like as shown in table 2.

Table 2: Scale vs Acceptance level

Scale	Acceptance Level
1-3	Low
4-5	Medium
6-8	High
9-10	Very High

The PC19S is ranged with four different categories and the dimensions considered for the same analysis is said to be psychosomatic, psychological, economic and social. The approximation is given for some points ranging from 1 to 10 and the level of post covid effects are measured using this kind of acceptance levels.

B.   Work-Family conflict Scale (WFcS)

To measure how much stress there is between work and family life, psychologists created the Work-Family Conflict Scale. It is widely used in academic and business settings as a tool for assessing the impact of work-family tensions. The Work-Family Conflict Scale is a set of statements or questions designed to assess how much tension an individual experiences between their professional and personal commitments. These claims may evaluate the level of conflict between work and family obligations, or vice versa. For example:

"I feel stressed and overwhelmed because of the demands of my job and family."

"My work schedule makes it difficult for me to spend time with my family."

"I have to miss important family events because of work obligations."

On a Likert scale, respondents are asked how much they agree or disagree with each statement (e.g., strongly agree to strongly disagree). Individuals with high levels of work-family conflict can be identified using their scores on the Work-Family Conflict Scale, and interventions to reduce this conflict can be evaluated using these same scores.

C.   Family Work Conflict Scale (FWcS)

The Family Work Conflict Scale is a psychometric tool that was made to measure how much work responsibilities get in the way of family life responsibilities. It is often used in research studies and in organisations to measure the effect of family-work conflict on people and their performance. Most of the time, the Family Work Conflict Scale is made up of a series of statements or questions that people are asked to answer to find out how much trouble they have balancing their work and family responsibilities. These statements could be used to figure out how much a person's responsibilities at work or home

get in the way of their responsibilities elsewhere. For example:

"My family responsibilities often interfere with my ability to perform well at work."

"I find it difficult to balance the demands of my job with the needs of my family."

"My family obligations make it hard for me to focus on my work tasks."

On numerous occasions, it will be requested of the participants that they use a Likert scale to indicate the degree to which they agree or disagree with each statement (e.g., strongly agree to strongly disagree). Both the efficacy of interventions designed to reduce family-work conflict and the identification of individuals who are experiencing high levels of conflict can be accomplished with the help of the Family Work Conflict Scale. Both the Work-Family Conflict Scale and the Family Work Conflict Scale have very strong connections with one another. The Work-Family Conflict Scale is a tool that can be used to determine how much a person's stress at work interferes with their ability to meet the obligations they have to their family. It is only possible to have a complete understanding of the complicated connection between one's work and family responsibilities, as well as how that connection affects one's health and happiness, if both of these dimensions are considered.

D. Life Satisfaction Scale(LsS)

The Life Satisfaction Scale is a psychometric instrument designed to measure an individual's overall satisfaction with their life. It is commonly used in research studies and clinical settings to assess an individual's subjective well-being and to evaluate the effectiveness of interventions aimed at increasing life satisfaction. The Life Satisfaction Scale typically includes a series of statements or questions that measure an individual's satisfaction with different aspects of their life, such as connections, work, health, and leisure activities. For example:

"Overall, I am satisfied with my life."

"I am satisfied with my connections with family and friends."

"I am satisfied with my job or career."

Participants are usually asked to rate their agreement with each statement on a Likert scale (e.g., strongly agree to strongly disagree). Individuals with low Life Satisfaction Scale scores can be identified, and interventions to boost life satisfaction can be assessed, using this measure.

E. Organisational Support Scale(OsS)

The Organizational Support Scale is a psychometric instrument designed to measure an employee's perception of the support they receive from their organization. It is commonly used in research studies and organizational settings to assess the level of support an organization provides to its employees and to evaluate the effectiveness of interventions aimed at increasing organizational support. The Organizational Support Scale typically includes a series of statements or questions that measure an employee's perception of how much their organization values their contribution and well-being. For example:

"My organization cares about my well-being."

"My organization provides the resources necessary for me to perform my job effectively."

"My organization is supportive of my personal and professional development."

Participants are usually asked to rate their agreement with each statement on a Likert scale (e.g., strongly agree to strongly disagree). Scores on the Organizational Support Scale can be used to identify areas where an organization may need to improve its support for employees and to evaluate the effectiveness of interventions aimed at increasing organizational support.

F. Organisational Commitment Scale (OcS)

The Organizational Commitment Scale is a psychometric instrument designed to measure an employee's commitment to their organization. It is commonly used in research studies and organizational settings to assess employees' commitment to their organization and evaluate the effectiveness of interventions aimed at increasing organizational commitment.

The Organizational Commitment Scale typically includes a series of statements or questions that measure an employee's emotional attachment, identification, and loyalty to their organization. For example:

" I take great pride in being able to say that I am a member of this organization."

" I am prepared to go above and beyond what is typically anticipated of me in terms of the amount of effort that I put in to ensure that this organisation achieves its goals."

"This organization has a great deal of personal meaning for me."

Participants are usually asked to rate their agreement with each statement on a Likert scale (e.g., strongly agree to disagree strongly). Scores on the Organizational Commitment Scale can be used to identify areas where an organization may need to improve its efforts to increase employee commitment and to evaluate the effectiveness of interventions aimed at increasing organizational commitment.

3.3. T-test

A t-test is a statistical test that is used to find out if there is a big difference between the means of two groups or not. This method is often used when the samples being compared are different from each other (that is, the people in one sample are not the same as the people in the other sample) and the data being compared are normally distributed. Researchers can use one of two kinds of t-tests: the independent samples t-test or the paired samples t-test. The t-test for independent samples is the best statistical test to use to compare the means of two different groups. For example, a researcher could use an independent samples t-test to find out if there is a big difference between the average test scores of students who were given a new way to study and those who were not. This would let the researcher compare the results of the students who used the new way to study with the results of the students who didn't. The paired samples t-test, which is also called the dependant samples t-test, is the best way to compare the means of two groups that are related. For example, a researcher might use a paired samples t-test to see if there is a big difference between the average blood pressure of patients before and after they started taking a new drug. This would help them figure out if the change is important or not. In a t-test, the null hypothesis is the idea that there is no statistically significant difference between the means of the two groups being compared. This is the case for both kinds of t-tests. The t-test figures out a t-value based on the difference between the means of the samples and the amount of variation in each sample. The p-value shows how likely it is that the difference that was seen was due to random chance. There is a statistically significant difference between the means of the two groups if the p-value is less than the significance level, which is typically set at 0.05. There is a difference, so the null hypothesis is false.

3.4. F-test

In the same way that the analysis of variance F-test does, the F-test compares the mean scores of more than one group or sample. This test is also known as the F-test in some circles. In contrast to the t-test, which only compares the means of the two groups being studied, this test takes into account a great deal more data. The F-test is used to determine whether or not there is a significant difference between two groups by comparing their standard deviations of their respective mean values. It is common practise to make use of the F-statistic, which can be calculated by dividing the mean difference between the groups by the mean difference within each group. We do this so that we can get a better understanding of how significant the findings are. You can find out how likely it is to get a particular F-statistic by looking at the F-distribution table pertaining to that statistic. The F-statistic is a statistic that follows a distribution that is called the F-

distribution. According to the results of the F-null test, there is not a statistically significant difference between the means of the two groups. If the F-statistic that was calculated is greater than the critical value that was found in the F-distribution table, then the null hypothesis is rejected and it is inferred that there is a statistically significant difference in the group means. The F-test can be used for various applications, including testing the effectiveness of different treatments or interventions on a particular outcome, comparing the performance of different groups in a study, or examining the effects of different factors on a dependent variable. Overall, the F-test is a powerful statistical tool for analyzing data with multiple groups, and it is widely used in research studies and data analysis in various fields, including social sciences, business, and engineering

3.5. Deep Canonical Correlation Analysis (DCCA)

Deep Canonical Correlation Analysis (DCCA) is a multivariate statistical technique used to find the linear connection between two sets of high-dimensional variables. It is an extension of Canonical Correlation Analysis (CCA) that uses deep neural networks to model the connection between the variables. The goal of DCCA is to find a low-dimensional representation of two sets of variables that have the highest correlation between them. DCCA seeks to learn nonlinear mappings from the original high-dimensional variables to a lower-dimensional space, where the canonical correlation between the two sets of variables is maximized. The DCCA method involves training two deep neural networks, one for each set of variables, to produce a low-dimensional representation of the variables. The neural networks are trained to optimize a loss function that maximizes the correlation between the low-dimensional representations of the two sets of variables. DCCA has several advantages over traditional CCA. Firstly, it can handle nonlinear connections between variables, which traditional CCA cannot do. Secondly, DCCA is more effective in dealing with high-dimensional data, as it learns a low-dimensional representation of the data that captures the most relevant information. Finally, DCCA can be used for both unsupervised and supervised learning tasks. DCCA has many uses and is applicable to many fields. Some examples include computer vision, speech recognition, NLP, and bioinformatics. It has been used to discover novel connections between complex data sets and to develop predictive models for use in classification, regression, and clustering.

3.6. Fuzzy Regression model (FRM).

Fuzzy regression models are a type of regression analysis that use fuzzy sets to model uncertainty and imprecision in data. Fuzzy sets are a mathematical framework for representing uncertainty, which allow for the

representation of partial membership and uncertainty in a set. In fuzzy regression, the traditional crisp input-output data is replaced by fuzzy input-output data. This means that instead of having precise values for the input and output variables, there are fuzzy sets that represent the possible values and the degree of membership to those values. Fuzzy regression models use fuzzy logic to construct a regression function that maps the fuzzy input variables to the fuzzy output variable. For this, a fuzzy rule-based system is used. This system connects the input variables with the output variables through the use of an if-then rule set. Next, in order to determine the membership functions of the output variables, the fuzzy regression model applies the fuzzy rules to both the membership functions of the input variables and the output variables themselves. The membership function uses the output variable's predefined fuzzy sets to figure out how much a given value of the output variable fits into the scope of a set. Fuzzy regression models have several advantages over traditional regression models. They can handle imprecise and uncertain data more effectively, and can provide more meaningful results in situations where data is incomplete or noisy. Fuzzy regression models can also be used for forecasting and decision-making problems in various fields, including finance, economics, engineering, and environmental science.

4. Results and Discussion

The experimentation process is done to identify the process happened from the collected information's which was normally distributed. The analysis is done for tracing out the skewness value and the kurtosis value by seeking the range between -1.5 and +1.5 to identify the normality of the distribution. Then if the kurtosis and skewness value is in between -0.8 and +0.8 then the distribution is considered to be normal. The specific range of values are fixed as threshold values and is considered to be normal and unformal. For better analysis, the T-test is employed for determining the status of the obtained scores which was used in this research was illustrated in the table 3. The four parameters like Psychosomatic, Psychological, economic and social relevance are analysed for all the possible scales and the obtained t-test values along with the mean , standard deviation and probability values. The 40 males and 160 females are indulged in this research. The variation was notified for both the employees and higher officials with varying ages. The variation was notified in case of mean, standard deviation etc.

Table 3: T-Test Results by considering the Gender Values

Parameters	Sub scales	Male/Female	Count	Mean	Standard Deviation	t	P
PC19S	Psychosomatic	Male	40	3.19	1.74	3.45	0.985719
		Female	160	3.01	1.56	4.23	0.999942
	Psychological	Male	40	2.99	1.54	3.43	0.999526
		Female	160	2.19	0.74	2.56	0.674288
	Economic	Male	40	2.07	0.62	3.18	0.581035
		Female	160	2.08	0.63	2.56	0.589145
	Social	Male	40	3.32	1.87	3.34	0.955572
		Female	160	2.99	1.54	2.54	0.999526
WFcS	Psychosomatic	Male	40	2.37	0.92	1.67	0.795602
		Female	160	4.21	2.76	2.29	0.372399
	Psychological	Male	40	3.87	2.42	4.43	0.660581
		Female	160	3.19	1.74	5.21	0.985719
	Economic	Male	40	2.96	1.51	4.41	0.998152
		Female	160	2.02	0.57	3.54	0.539632
	Social	Male	40	1.33	1.12	4.16	0.9001
		Female	160	1.2	1.21	3.54	0.935616
FWcS	Psychosomatic	Male	40	1.08	1.11	4.32	0.895699
		Female	160	1.09	1.78	3.52	0.978197
	Psychological	Male	40	2.33	0.88	2.65	0.770739
		Female	160	2	0.55	3.27	0.522687
	Economic	Male	40	1.38	1.65	2.67	0.996865
		Female	160	3.22	1.77	3.45	0.980224
	Social	Male	40	2.88	1.43	2.65	0.990105
		Female	160	1.44	1.19	1.78	0.928369
LsS	Psychosomatic	Male	40	4.08	2.63	2.4	0.489567
		Female	160	3.9	2.45	1.78	0.637765
	Psychological	Male	40	3.21	1.76	2.56	0.982154
		Female	160	3.08	1.63	1.76	0.998248
	Economic	Male	40	2.96	1.51	0.89	0.998152
		Female	160	2.97	1.52	1.51	0.99871
	Social	Male	40	4.21	2.76	3.65	0.372399
		Female	160	3.88	2.43	4.43	0.653041
OsS	Psychosomatic	Male	40	3.26	1.81	3.63	0.971527
		Female	160	5.1	3.65	2.76	-0.48679
	Psychological	Male	40	4.76	3.31	3.38	-0.16761
		Female	160	3.32	1.87	2.76	0.955572
	Economic	Male	40	2.6	1.15	3.54	0.912764
		Female	160	2.42	0.97	2.74	0.824886
	Social	Male	40	1.73	0.28	1.87	0.276356
		Female	160	1.6	0.15	2.49	0.149438
OcS	Psychosomatic	Male	40	1.48	0.03	2.76	0.029996
		Female	160	1.49	0.04	3.54	0.039989
	Psychological	Male	40	2.73	1.28	2.74	0.958016
		Female	160	2.4	0.95	1.87	0.813416
	Economic	Male	40	1.78	0.33	2.49	0.324043
		Female	160	3.62	2.17	1.87	0.825785
	Social	Male	40	3.28	1.83	2.65	0.966594
		Female	160	1.84	0.39	1.85	0.380188

From the overall analysis the significant difference is statistically identified in terms of the males and females in consideration with the entire scales of determination. This was illustrated graphically as shown in Figure 2.
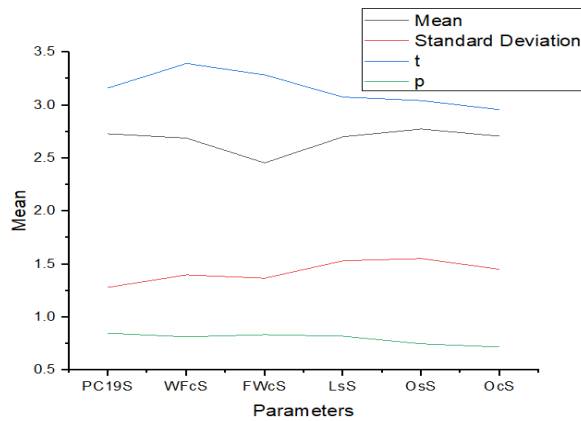

Fig 2: T-Test Results by considering the Gender Values

From that the Work family conflict/ family work conflict and life satisfaction values are almost favour to male employees and organisational support and organisational commitment was in favour of female employees. Another analysis is made with the various positions held at the cashew office by both the male and the female employees in consideration with the scales determined. This is illustrated in table 4.

Table 4: t-Test results by Job Positions

Parameters	Working Positions	Count	Mean	Median	Standard Deviation	t	p
PC19S	Supervisor	8	4.18	2.2	3.19	2.793333	0.23
	Assistant Manager	4	4	2.02	3.01	2.673333	0.43
	Manager	1	3.98	2	2.99	2.66	0.12
	Data Entry Operator	2	3.18	1.2	2.19	2.126667	0.32
	Business Development Executive	3	3.06	1.08	2.07	2.046667	0.36
	Purchase Manager	2	3.07	1.09	2.08	2.053333	0.56
	Marketing Executive	2	4.31	2.33	3.32	2.88	0.25
	Stores and Logistic Executive	3	3.98	2	2.99	2.66	0.45
	House Keeping	13	3.36	1.38	2.37	2.246667	0.79
	Labour-Working	162	5.2	3.22	4.21	3.473333	0.99
WFcS	Supervisor	8	4.86	2.88	3.87	3.246667	0.68
	Assistant Manager	4	4.18	2.2	3.19	2.793333	0.88
	Manager	1	3.95	1.97	2.96	2.64	0.79
	Data Entry Operator	2	3.01	1.03	2.02	2.013333	0.99
	Business Development Executive	3	2.32	0.34	1.33	1.553333	0.68
	Purchase Manager	2	2.19	0.21	1.2	1.466667	0.88
	Marketing Executive	2	2.07	0.09	1.08	1.386667	0.92
	Stores and Logistic Executive	3	2.08	0.1	1.09	1.393333	0.21
	House Keeping	13	3.32	1.34	2.33	2.22	0.87
	Labour-Working	162	2.99	1.01	2	2	0.34
FWcS	Supervisor	8	2.37	0.39	1.38	1.586667	0.56
	Assistant Manager	4	4.21	2.23	3.22	2.813333	0.78
	Manager	1	3.87	1.89	2.88	2.586667	0.27
	Data Entry Operator	2	2.43	0.45	1.44	1.626667	0.47
	Business Development Executive	3	5.07	3.09	4.08	3.386667	0.16
	Purchase Manager	2	4.89	2.91	3.9	3.266667	0.36
	Marketing Executive	2	4.2	2.22	3.21	2.806667	0.4
	Stores and Logistic Executive	3	4.07	2.09	3.08	2.72	0.6
	House Keeping	13	3.95	1.97	2.96	2.64	0.29
	Labour-Working	162	3.96	1.98	2.97	2.646667	0.49
LsS	Supervisor	8	5.2	3.22	4.21	3.473333	0.83
	Assistant Manager	4	4.87	2.89	3.88	3.253333	0.67
	Manager	1	4.25	2.27	3.26	2.84	0.72
	Data Entry Operator	2	6.09	4.11	5.1	4.066667	0.92
	Business Development Executive	3	5.75	3.77	4.76	3.84	0.83
	Purchase Manager	2	4.31	2.33	3.32	2.88	0.75
	Marketing Executive	2	3.59	1.61	2.6	2.4	0.72
	Stores and Logistic Executive	3	3.41	1.43	2.42	2.28	0.92
	House Keeping	13	2.72	0.74	1.73	1.82	0.96
	Labour-Working	162	2.59	0.61	1.6	1.733333	0.25
OsS	Supervisor	8	2.47	0.49	1.48	1.653333	0.91
	Assistant Manager	4	2.48	0.5	1.49	1.66	0.38
	Manager	1	3.72	1.74	2.73	2.486667	0.6
	Data Entry Operator	2	3.39	1.41	2.4	2.266667	0.82
	Business Development Executive	3	2.77	0.79	1.78	1.853333	0.75
	Purchase Manager	2	4.61	2.63	3.62	3.08	0.62
	Marketing Executive	2	4.27	2.29	3.28	2.853333	0.5
	Stores and Logistic Executive	3	2.83	0.85	1.84	1.893333	0.51
	House Keeping	13	4.28	2.3	3.29	2.86	0.45
	Labour-Working	162	4.1	2.12	3.11	2.74	0.68
OcS	Supervisor	8	4.08	2.1	3.09	2.726667	0.8
	Assistant Manager	4	3.28	1.3	2.29	2.193333	0.49
	Manager	1	3.16	1.18	2.17	2.113333	0.78
	Data Entry Operator	2	3.17	1.19	2.18	2.12	0.86
	Business Development Executive	3	4.41	2.43	3.42	2.946667	0.35
	Purchase Manager	2	4.08	2.1	3.09	2.726667	0.55
	Marketing Executive	2	3.46	1.48	2.47	2.313333	0.24
	Stores and Logistic Executive	3	5.3	3.32	4.31	3.54	0.44
	House Keeping	13	4.96	2.98	3.97	3.313333	0.48
	Labour-Working	162	4.28	2.3	3.29	2.86	0.68

The findings of the t-test conducted on the data from the study are presented in Table 4. The job title was used as the independent variable. On the post COVID-19 Scale, assistant managers and managers scored significantly higher than other supervisors and labours overall. After the conflict was resolved, both Assistant managers found themselves in a stronger position. Based on these findings, managers are significantly less concerned with COVID-19 than Assistant managers (p > 0.34). Assistant managers expressed a significantly higher level of satisfaction with their lives than managers. Even though there was not a statistically significant difference between the degrees to which work and family responsibilities interfered with people's lives based on gender (p > 0.34), this was still the case. The results of the t-test that were used to examine the hypothesis that researchers hypothesized a connection between the years of experience of Workers and their mean and standard deviations of scale scores are presented which can be found here in figure 3.
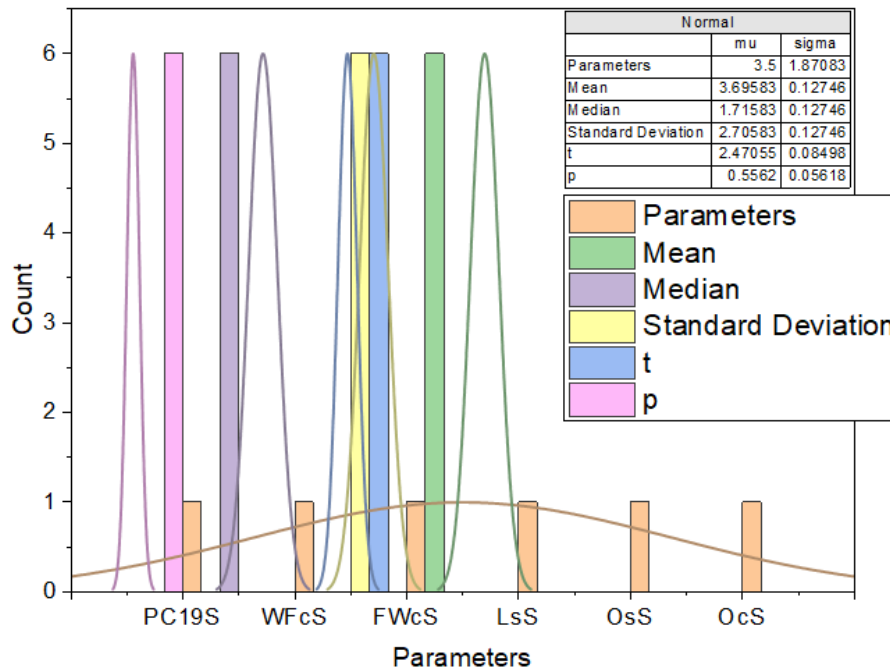

Normal		
	mu	sigma
Parameters	3.5	1.87083
Mean	3.69583	0.12746
Median	1.71583	0.12746
Standard Deviation	2.70583	0.12746
t	2.47055	0.08498
p	0.5562	0.05618

Fig 3: t-Test results by Job Positions

On the Post COVID-19 Scale, a statistically and clinically significant difference was discovered between those with more years of experience and those with fewer years. On both the overall scale and the subscales, those with less than ten years of experience in the role of school administrator performed better probability. Those individuals who had worked in educational administration for a period of ten years or less benefited from this distinction. Compared with their less-seasoned counterparts, Ordinary labours including house keeping persons with 11 years or more of experience expressed significantly less concern about COVID-19 (10 years). COVID-19 discovered that the most significant factors contributing to people's problems were social and psychological issues. An analysis of variance (ANOVA) was performed to investigate the correlation between age and scale scores. Table 5 contains the findings that were uncovered as a result of the research.

There is a correlation between the participants' mean scores on the PC19S and the Work-Family/Work-Family Conflict Scale with increasing age, as shown in Table 5. The significance level for this correlation was set at 0.43. The two different kinds of measuring devices were provided to each participant in the study. The findings of this study indicate that those in the education administration who are between the ages of 31 and 40 should have the greatest concern regarding the spread of COVID-19. Those administrators between the ages of 31 and 40 reported significantly more difficulty juggling their professional and personal lives, which was similar to the experience of those older administrators.

Table 5: F Test Results considering Age values

Parameters	Sub scales	Male/Female	Count	Mean	Standard Deviation	F	p
PC19S	24-30	Male	9	3.88	1.99	2.89	0.755719
		Female	34	3.7	1.81	3.67	0.769942
	31-40	Male	13	3.68	1.79	2.87	0.769526
		Female	51	2.88	0.99	2	0.444288
	41-50	Male	8	2.76	0.87	2.62	0.351035
		Female	45	2.77	0.88	2	0.359145
	50-55	Male	6	4.01	2.12	2.78	0.725572
		Female	27	3.68	1.79	1.98	0.769526
	>55	Male	4	4.05	1.68	1.68	0.785719
		Female	3	3.15	1.9	2.09	0.799942
WFcS	24-30	Male	9	3.06	1.17	1.11	0.565602
		Female	34	4.9	3.01	1.73	0.142399
	31-40	Male	13	4.56	2.67	3.87	0.430581
		Female	51	3.88	1.99	4.65	0.755719
	41-50	Male	8	3.65	1.76	3.85	0.768152
		Female	45	2.71	0.82	2.98	0.309632
	50-55	Male	6	2.02	1.37	3.6	0.6701
		Female	27	1.89	1.46	2.98	0.705616
	>55	Male	4	1.77	1.36	3.76	0.665699
		Female	3	1.78	2.03	2.96	0.748197
FWcS	24-30	Male	9	3.02	1.13	2.09	0.540739
		Female	34	2.69	0.8	2.71	0.292687
	31-40	Male	13	2.07	1.9	2.11	0.766865
		Female	51	3.91	2.02	2.89	0.750224
	41-50	Male	8	3.57	1.68	2.09	0.760105
		Female	45	2.13	1.44	1.22	0.698369
	50-55	Male	6	4.77	2.88	1.84	0.259567
		Female	27	4.59	2.7	1.22	0.407765
	>55	Male	4	3.9	2.01	2	0.752154
		Female	3	3.77	1.88	1.2	0.768248
LsS	24-30	Male	9	3.65	1.76	0.33	0.768152
		Female	34	3.66	1.77	0.95	0.76871
	31-40	Male	13	4.9	3.01	3.09	0.142399
		Female	51	4.57	2.68	3.87	0.423041
	41-50	Male	8	3.95	2.06	3.07	0.741527
		Female	45	5.79	3.9	2.2	0.382399
	50-55	Male	6	5.45	3.56	2.82	0.670581
		Female	27	4.01	2.12	2.2	0.262399
	>55	Male	4	3.29	1.4	2.98	0.682764
		Female	3	3.11	1.22	2.18	0.594886
OsS	24-30	Male	9	2.42	0.53	1.31	0.046356
		Female	34	2.29	0.4	1.93	-0.08056
	31-40	Male	13	2.17	0.28	2.2	-0.2
		Female	51	2.18	0.29	2.98	-0.19001
	41-50	Male	8	3.42	1.53	2.18	0.728016
		Female	45	3.09	1.2	1.31	0.583416
	50-55	Male	6	2.47	0.58	1.93	0.094043
		Female	27	4.31	2.42	1.31	0.595785
	>55	Male	4	3.97	2.08	2.09	0.736594
		Female	3	2.53	0.64	1.29	0.150188
OcS	24-30	Male	9	3.53	1.99	0.315	0.032399
		Female	34	3.35	1.76	0.195	0.320581
	31-40	Male	13	3.33	0.82	0.205	0.645719
		Female	51	2.53	1.37	1.445	0.658152
	41-50	Male	8	2.41	1.46	1.115	0.199632
		Female	45	2.42	1.36	0.495	0.5601
	50-55	Male	6	3.66	2.03	2.335	0.595616
		Female	27	3.33	1.13	1.995	0.555699
	>55	Male	4	3.7	0.8	0.555	0.638197
		Female	3	2.8	1.9	0.31	0.430739

The Least Significant Difference (LSD) test was also carried out to look for differences between the age groups. This test can be thought of as a type of "post-hoc" analysis. The findings of the study are presented for consideration in Figure 4.
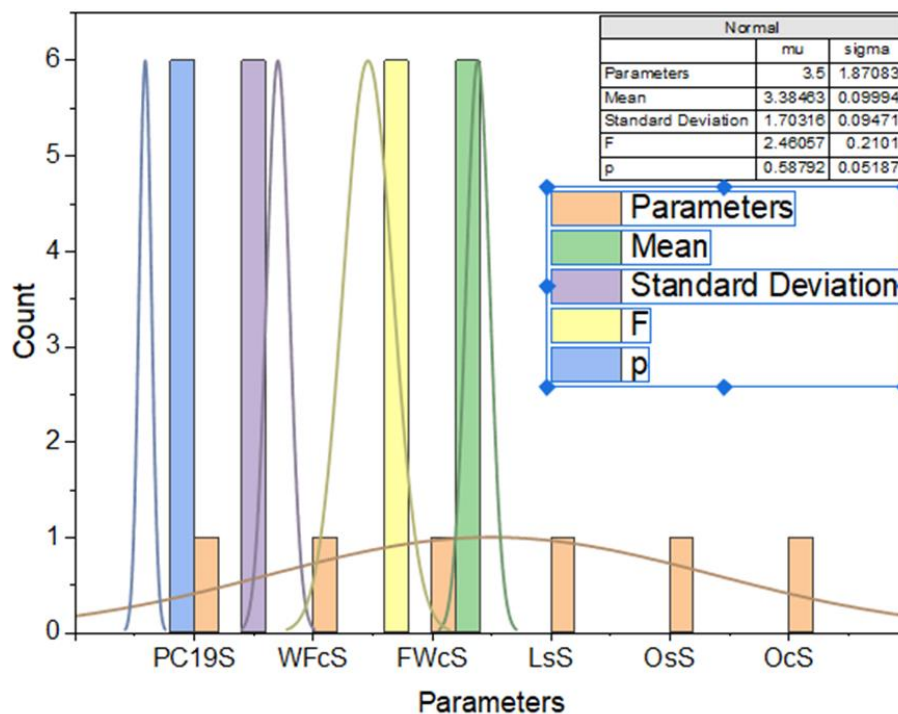
Fig 4: Graphical representation of F Test Results considering Age values

After taking into account the age of the participants, the researchers found that there was no statistically significant link between how the participants rated their work-family conflicts on the Work-Family/Work Conflict Scale and how happy they were with their lives on the Life Satisfaction Scale. Instead, they found a link between how the participants felt about work-family conflicts and how happy they were with their lives. Workers between the ages of 31 and 40 who had higher mean scores on the Work-Family/Work-Work Conflict Scale and the post-COVID-19 Scale were found. These scales measure how much work and family life get in the way of each other. Each person who took part in the study was told the results of the LSD test. This made the study more credible and made sure that everyone knew the results. There are a lot

more COVID-19 fears and work-family conflicts among younger school administrators than among older and younger school administrators. People between the ages of 25 and 35 are also much more afraid of COVID-19 than people younger or older than them.

The main goal of this investigation was to find out if there was a link between the scale ratings or not. On the post-covid 19 and Work-Family/Family-Work Conflict Scale, school administrators between the ages of 25 and 35 did better than all other age groups. Both scales showed the same thing. This was the case for both scales. Both measures agreed that there was no difference. For effective analysis and to obtain the values to be accurate fuzzy model is used as shown in Table 6.

Table 6: Results by Fuzzy Reference Model

Parameters	Min	Max	Mean	Median	Standard Deviation	Skewness	Kurtosis
PC19S	2.12	5.5	3.24	3.81	0.59	-0.839	-0.155
WFcS	2.21	5.5	3.76	3.855	0.86	-0.567	0.117
FWcS	1.87	5.5	3.44	3.685	0.92	-0.508	0.176
LsS	1.79	5.5	4.02	3.645	0.89	-0.536	0.148
OsS	1.65	5.5	3.89	3.575	0.65	-0.777	-0.093
OcS	2.06	5.5	4.11	3.78	0.95	-0.474	0.21

A connection exists between having a low level of work-family or family-work conflict and having a high level of life satisfaction, as measured by the Life Satisfaction

Scale. Before beginning the analysis, the quality of the data set that would be used for the regression was examined by looking at graphs as shown in figure 5
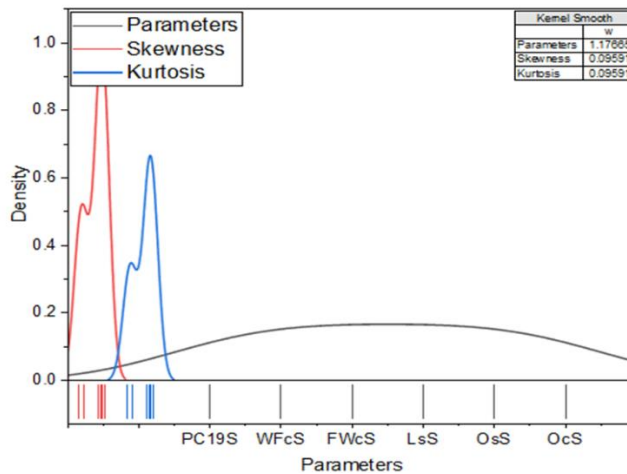
Fig 5: Graphical Representation of the Fuzzy Reference Model.

Here in addition the skewness value and the kurtosis value is determined. The predictive validity of the COVID-19 Phobia Scale in relation to the Work-Family/Work-Conflict Scale and the Life Satisfaction Scale was examined using a multiple regression model. After reviewing the data, it was decided that a regression analysis would be the best approach to further investigate the situation. The entire collection of findings is condensed into Figure 5. It was discovered that the COVID-19 phobia variable has a connection that is statistically significant with the life satisfaction variable. It was found that there was a correlation between this variable and work-family conflict ($F = 94.162$, $p = 0.01$). The following is a concise summary of the research findings, provided for your convenience. This was illustrated in table 7.

Table 7: Deep Canonical Correlation Analysis

Parameters	Total Count	Mean	Standard Deviation	Canonical Correlation	Squared Canonical Correlation	Cumulative percentage	Percentage	Eigen Value
PC19S	200	68.45	2.34	0.87	0.96	0.915	91.5	5.34
WFcS	200	56.74	10.23	0.65	0.88	0.765	76.5	4.24
FWcS	200	61.43	12.34	0.34	0.57	0.455	45.5	4.12
LsS	200	49.54	2.42	0.12	0.35	0.235	23.5	3.23
OsS	200	59.04	1.67	0.09	0.32	0.205	20.5	3.45
OcS	200	49.23	2.21	0.11	0.34	0.225	22.5	2.43

Table 7 presents users with the opportunity to access these data. In a model that included multiple regressions and a variable that measured life satisfaction, the effect of COVID-19 anxiety on family-work conflict was determined to be 5.34 eigen value.. After including the variable, this was the result that was obtained. One example is that researchers discovered a correlation of 91.5% between an increase in family-work conflict and a 19% increase in fear of COVID-19. When life satisfaction was considered, there was a 0.915 standard deviation reduction in the gap between the number of conflicts experienced at home and in the workplace. This was the state of affairs before considering concerns regarding COVID-19. One indicator of happiness was related to a decrease of 0.915 units in the amount of friction between an individual's personal and professional lives.

5. Conclusion

In this work, a statistical analysis is done for experiencing the effects occurs due to covid 19 in the organisation where different kind of employees are working. Totally six different scales are used for the analysis PC19S, WFcS, FWcS, LsS, OsS and OcS for analysing the post covid 19 effects experienced by the employees in relation with their family experiencing the interrelation between the work-family conflict and family -work conflict which includes the entire satisfaction in their life along with organisational support and organisational commitment. The statistical analysis was done by making 200

employees(Both Male and Female) of cashew factory to participate in the analysis by conducting the relational survey model. The data analysis was done using the information collected by online questionaries and by doing T-test, F-test, Deep Canonical Correlation Analysis (DCCA) along with the analysis done using Fuzzy Regression model(FRM). The results proves that the women employees are suffering more due to post COVID 19 effects than male employees in consideration with the psychological dimensions. The obtaining results supports the policy makers of industries to develop the various strategies which will minimize the effects of post covid 19 effects for creating an efficient and sustainable employee performance.

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