

Determining the School Students Stress Factors Using Fuzzy Analytical Hierarchy Process

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Abstract:

Indian students are affected by stress and anxiety due to various reasons such as social stress, race, physical appearance etc., In particular today high school students are suffering in stress is very high. Students stress is an unavoidable phenomenon which hinders personal development, social interactions, peer influence and adolescence. Identifying the stress level of the student is a challenging task and it leads to uncertainty. Fuzzy set, it will give very good output over vagueness. Analytical hierarchy process is a multi criteria decision making problem which gives very good output over uncertainty. This work is based on the extensive analysis of the Indian school student stress factor using fuzzy analytical hierarchy process. Here we identified many factors which will affect the students stress and ranked factors.

1. Introduction

The circumstances are mainly defines in the Indian school environment. Indian school students feel the stress which leads to mental harassment. The adverse effects of stress on physical health in students that include a sudden consistent performances in academic, other weakness, unhappiness, sleeplessness and violence challenges. Studies show that stress and anxiety during teenage years may even have an undesirable effect on cardiac health of otherwise healthy youngsters. Stress and anxiety distress the human body substantially, it also can harm a person's emotional wellbeing as well. Stress and anxiety ranks affect the students academically and change the way the individual thinks and deeds throughout school or time spent in studying.

Stress subsists from the change in a person's thinking and their way of life nowadays. Now, every person have changed in their insights and the way they understand this life. Students in their adolescences are the ones who are going through the

provisional stage, which is a transitional of childhood and adulthood. In teen year's age, a lot of biological, physical, mental and emotional changes are happening, and even changes in role and responsibilities. To make constant in changes, students must undergoes challenged with problems and conflicts. For those students who are not capable of facing challenges, the changes will create stress and tension to them. If it is not dispensed with in the primary stages, the student may experience mental problems.

Stress can cause by the several complications that exist such as problems at school, financial issues, family issues and problems in their society. Teenagers also experience stress since they are imprisoned between making decisions which is to follow guidelines and orders. Previously youths are being trained for things that were suitable with their age so that they can practice it to achieve success in their lives. But the current scenario is that youths have to follow their parents' desires which are preparing them to compete in the social system where the society is scrambling towards

transformation of modern society so that they are not left behind. Uncertainty it is not accomplished well, stress can explode psychological conflicts among them when they are grown up. These conflicts will cause stress to the teenagers in the forthcoming if they are not overwhelmed now.

1.1 Fuzzy set

The fuzzy sets have been introduced by Lotfi A. Zadeh in 1965. Fuzzy sets are an extension of classical set theory and are used in fuzzy logic. In crisp set theory the membership of elements in relation to a set is assessed in binary terms according to a crisp condition but fuzzy set theory allows the gradual assessment of the membership of elements in relations to a set, this is described with the aid of a membership function valued in the real in $[0,1]$. The membership function maps crisp elements in the universe of discourse to elements' degree of membership with a certain interval, which is usually $[0,1]$. Then, the degree of membership specifies the extent to which a given element belongs to a set or is related to a concept. A fuzzy number is a special fuzzy set $F = \{x, \mu_F(x), x \in R\}$ where x are values on the real line, $R: -\infty < x, +\infty$ and $\mu(x)$ is a continuous mapping from R to the closed interval $[0,1]$. A triangular membership in fuzzy set theory is

$$\mu_F(x) = \begin{cases} 0 & x < a \\ \frac{x-a}{b-a} & a \leq x \leq b \\ \frac{c-x}{c-b} & b \leq x \leq c \\ 0 & x > c \end{cases} \quad \text{-----}(1)$$

And the triangular fuzzy number can be characterized by

$$\begin{aligned} \tilde{M} &= [a^\alpha, c^\alpha] = [(b-a)\alpha - (c-b)\alpha + c] \forall \alpha \in [0,1] \\ \tilde{M} \oplus \tilde{N} &= [M_L^\alpha + n_L^\alpha, m_R^\alpha + n_R^\alpha] \\ \tilde{M} \ominus \tilde{N} &= [M_L^\alpha - n_L^\alpha, m_R^\alpha - n_R^\alpha] \\ \tilde{M} \otimes \tilde{N} &= [M_L^\alpha n_L^\alpha, m_R^\alpha n_R^\alpha] \\ \tilde{M} \Xi \tilde{N} &= [M_L^\alpha / n_L^\alpha, m_R^\alpha / n_R^\alpha] \quad \text{-----}(2) \end{aligned}$$

There are several methods of multiple-criteria decision making (MDCD) methods to evaluate several alternatives to achieve a certain goal. AHP methods is used to solve many complex decision problems. The AHP (analytic hierarchy process) is one of the good methods. In the present work we are using FAHP (Fuzzy Analytic hierarchy process) is used to get more accurate results.

2. Literature Review

According to Adams(1983,in Kamaruddin, 1997) the main reason for stress among schooling children is activity associated with schooling such as communication and family problems. In addition, confusion to make decision and choose right career path, and also financial problems play vital role in increasing the stress level. Even Morris research on stress suggest that high school students face academic stress while competing with each other for good grades. In addition, stress and specific situation like learning environment in school, fear of failure and inability to do work effectively due to heavy work load hold intimate relationship.

Apart from these researchers, Fariza who conducted a research on stress among high school students found out that these students have to deal with academic world where hope and expectation from themselves and teachers as well as parents are maximum which ultimately leads to high stress. Moreover, Mates and alission suggested that to lower the stress level among high school kids, academic curriculum needs to be reevaluated and shifting the major focus to all round development of student rather than examination. Suitable teaching learning method needs to be brought into practice so that maximum level of achievement is reached with low stress. According to the research done by Dr.Sarason and his co-workers, he reveals the major setback for the all

round development of school children and their degrading performance is due to the increased stress. Heavy academic workload at school results in stress at physical, mental and emotional level. In addition to this, Ashad Ali Khan's blog explains about negative impact of stress in high school and reasons for increased stress level among students. According to him, people of all age group and professionals suffer from stress and high school students are more prone to this due to the certain biological, physical, emotional changes they undergo at teen age. Newman, J describes the relationship between stress level and academic achievement of high school student which is inversely proportional to each other. In addition, he compares the stress among different gender and urban as well as rural high school student. According to article published in International Journal of Multidisciplinary Research by Chandrasekhar Vazalwar, he describes this chronic issue of anxiety and stress as a kind of emotion that impacts on school student while reading English comprehension. In the real time problem, it is very difficult to extract the correct data of input and output and tackle them with crisp number which will reflect human's appraisals related to pair wise comparison. Satty[1] initial proposed AHP approach as decision making problem in 1980. Triantaphyllou et al [2] proposed AHP over Engineering application. Ranking of customer requirement using fuzzy analytical process proposed by K.Kwong et al[3]. F.ozgur catak et al.[5] proposed the selection of suitable DBMS for software using fuzzy analytical processes. With FAHP over selection of the aesthetic constrains of profile of the cars and their relative importance by H.C. Yadav et.al[4]. AHP and Bayesian network over the risk management system in Australia and Newzeland proposed by A.Ahmen et al.[9] in the year 2005. Satty [7] solved some smaller problem using AHP in different real time applications. Zeki Aya [10] proposed Fuzzy AHP over a real life manufacturing system and tested by simulation to produce a new product development environment. Systematic approach towards the technology selection using the fuzzy Delphi method to produce critical factors studied by Cheng-Haw et al [6]. In the year of 2005 Feng Kong et al [8] proposed how the key factors affect the success in E-commerce business using the fuzzy AHP and also to find the drawbacks and opportunities. In the year of 2010 Yu-Lung

Hsu et al [11] proposed fuzzy Delphi method and fuzzy AHP over the regenerative technologies to determine critical factors and also find the degree of all criterion as the measurable indicates of regenerative technologies. In 2011, Li Guo[12] proposed AHP over the online customer purchasing behaviours to determine the most influencing factors. In 2012, selection of economic cocoon traits development in silkworm breeding using the fuzzy analytical hierarchy process studied by Shaverdi et al [13]. In 2012, Berkir et al [14] was proposed Analytical hierarchy process and rough set over supplier based on the many criteria. In 2012, Dan Wang et.al [15] proposed for predicting highest temperature and lower temperature in abnormal weather conditions using the fuzzy analytical hierarchy process and rough sets. In 2012, Chen et.al [16] proposed analytical hierarchy process and fuzzy analytical hierarchy process over the hotel atmosphere to determine the key factors. Using fuzzy AHP vendor selection problems over the supply chain management in a difficult situation proposed by Saroj Koul et al[17] in 2012. In 2013, Alessio Ishizaka et al[18] proposed, selection of bank account for students using the fuzzy set theory. In 2013, seong knn lee et al[19] proposed a hybrid model for efficiently of energy using the fuzzy analytical hierarchy process and data envelopment analysis. In 2012 Ajay verma et al [20] proposed to determine the adopting and implementation of green supply chain management in Indian pharmaceutical companies using fuzzy analytical hierarchy process to check the consistency approaches. In 2013, hybrid fuzzy analytical hierarchy process model was proposed by chang et al [21] to solve the location choice in international distribution centre. In 2013 Fuzzy analytical hierarchy process and DEMATEL to find the ERP critical success Factor in the industries proposed by Saeed Rouhani et al. [22]. In 2013, Aggarwal et al [23] proposed to improve the quality of Prioritization of an employee's performance using the Fuzzy AHP . (2012) In the pharmaceutical industry prioritizing the criteria involved in selection of global supplier using the FAHP by Aysegul Tas et.al [24]. Use of the fuzzy analytical hierarch process over interpretive structural modelling to determine the risks mitigation in the development of mangos teen supply chain in Indonesia was studied by Rentno et al [25] in 2013. In the literature reviewed above many researchers

proposed a lot of fuzzy and AHP approaches in the present work fuzzy AHP model is used for dealing with the situation of how to rank which stress factors are affecting more for the school students in india.

3. Methodology in Fuzzy AHP

In this work , triangular fuzzy number , $\tilde{1}$ to $\tilde{9}$ pair wise used to represent subjective pair wise comparisons. Here triangular fuzzy numbers are defined according to that fuzzy numbers are defined with the corresponding membership function.

Here the α -cut and μ into the fuzzy AHP matrix taking care of the accuracy of the measurement. The α -cut value depends upon the decision maker or expert's confidence level of the judgments. Here the α -cut =0. 5 and μ =0. 5.

3.1 Calculating importance weights of fuzzy numbers

The lower limit and upper limit of the fuzzy number with respect to the alpha can be defined by equation (2)

$$\begin{aligned}\tilde{1} &= [1, 3 - 2\alpha] \\ \tilde{3} &= [1 + 2\alpha, 5 - 2\alpha] & \tilde{3}^{-1} &= \left[\frac{1}{5 - 2\alpha}, \frac{1}{3 + 2\alpha} \right] \\ \tilde{5} &= [3 + 2\alpha, 7 - 2\alpha] & \tilde{5}^{-1} &= \left[\frac{1}{7 - 2\alpha}, \frac{1}{3 + 2\alpha} \right] \\ \tilde{7} &= [5 + 2\alpha, 9 - 2\alpha] & \tilde{7}^{-1} &= \left[\frac{1}{9 - 2\alpha}, \frac{1}{5 + 2\alpha} \right] \\ \tilde{9} &= [7 + 2\alpha, 11 - 2\alpha] & \tilde{9}^{-1} &= \left[\frac{1}{11 - 2\alpha}, \frac{1}{7 + 2\alpha} \right]\end{aligned} \quad \text{-----}(3)$$

3.2 Analytic Hierarchy Process (AHP)

The AHP which is a powerful tool in applying Multicriteria Decision Analysis was introduced by Satty in 1980 [4]. The Analytic Hierarchy Process is a powerful and flexible decision making technique to help with the decision for both qualitative and quantitative aspects . In this method, finding the weights or priority vector of the alternatives or the criteria is required. For

this purpose pair wise comparison matrix developed.

Table-1
Analytic Hierarchy Process pair wise comparison scale

Numerical values	Linguistics scale	Explanation
1	Equal importance of both elements	Two elements contribute equally
3	Moderate importance of one element over another	Experience and judgment favour one element over another
5	Strong importance of one element over another	An element is very strongly dominant
7	Very strong importance of one element over another	An element is favoured by at least an order of magnitude
9	Extreme importance of one element over another	An element is favored by at least more than an order of magnitude
2,4,6,8	Intermediate values	Used to compromise between two judgments

3.3 Fuzzy AHP

Fuzzy analytic Hierarchy Process proposed by Laarhoven and Pedrycz (1983) which is an application of the combination of Analytic Hierarchy Process (AHP) and Fuzzy Theory. In FHAP converts the opinions of experts from previous definite values to fuzzy numbers and membership functions.

Table-2

Linguistic Scale	Triangular Fuzzy scale	Fuzzy Number	Intensity of importance
Equally important	(1,1,1)	$\tilde{1}$	1
Moderately	(1,3,5)	$\tilde{3}$	3

more important			
Strongly more important	(3,5,7)	$\tilde{5}$	5
Very strongly more important	(5,7,9)	7	7
Extremely more important	(7,9,11)	$\tilde{9}$	9

FAHP proves that many concepts in real time have fuzziness. So the opinions of decision makers are converted from previous definite values to0 fuzzy numbers in the FAHP [5].

The following step is involved in FAHP method

1. Using the questionnaires collects opinions from the expert by using the linguistic variable in questionnaires.
2. The triangular fuzzy number is calculated from the factor given by experts. Using the geometric mean proposed by Klir and Yuan (1985) find out the significance triangular fuzzy number of the alternate factor is found.
3. Constructing the fuzzy comparison matrix by using a triangular fuzzy number via pairwise comparison, the fuzzy judgment matrix

$A(a_{ij})$ is constructed as given below

$$\tilde{A}_{ij} = \begin{bmatrix} 1 & \tilde{a}_{12} & \tilde{a}_{13} & \dots & \tilde{a}_{1(n-1)} & \tilde{a}_{1n} \\ \tilde{a}_{21} & 1 & \tilde{a}_{23} & \dots & \tilde{a}_{2(n-1)} & \tilde{a}_{2n} \\ & & 1 & \dots & & \\ & & & \dots & & \\ \tilde{a}_{(n-1)1} & \tilde{a}_{(n-1)2} & \tilde{a}_{(n-1)3} & \dots & 1 & \tilde{a}_{(n-1)n} \\ \tilde{a}_{n1} & \tilde{a}_{n2} & \tilde{a}_{n3} & \dots & \tilde{a}_{n(n-1)} & 1 \end{bmatrix}$$

Where

$$a_{ij} = \begin{cases} \tilde{1}, \tilde{3}, \tilde{5}, \tilde{7}, \tilde{9} & \text{or } \tilde{1}^{-1}, \tilde{3}^{-1}, \tilde{5}^{-1}, \tilde{7}^{-1}, \tilde{9}^{-1}, i = j, i \neq j \end{cases}$$

Finding the fuzzy Eigen values. A fuzzy Eigen value, $\tilde{\lambda}$, is fuzzy number solution

$$\tilde{A}\tilde{x} = \tilde{\lambda}\tilde{x} \text{-----(4)}$$

Where $\tilde{A}$ nxn fuzzy matrix containing fuzzy numbers $\tilde{a}_{ij}$ and $\tilde{x}$ is a non zero nx1 fuzzy vector containing fuzzy number $\tilde{x}_i$. In fuzzy multiplications and additions using the interval arithmetic and α cut, Equation 1 is equivalent to

$$[a_{il}^{\alpha}x_{il}^{\alpha}, a_{iu}^{\alpha}x_{il}^{\alpha}] \oplus \dots \oplus [a_{il}^{\alpha}x_{nl}^{\alpha}, a_{iu}^{\alpha}x_{nu}^{\alpha}] = [\lambda x_{il}^{\alpha}, \lambda x_{iu}^{\alpha}]$$

Where

$$\tilde{A} = [a_{ij}] \quad , \quad \tilde{x}^t = (\tilde{x}_1, \dots, \tilde{x}_n)$$

$$\tilde{a}_{ij}^{\alpha} = [a_{ijl}^{\alpha}, a_{iju}^{\alpha}] \quad \tilde{x}_i^{\alpha} = [x_{il}^{\alpha}, x_{iu}^{\alpha}], \tilde{\lambda}^{\alpha} = [\lambda_l^{\alpha}, \lambda_u^{\alpha}]$$

where $0 < \alpha \leq 1$

4. Degree of satisfaction of the judgment matrix $\tilde{A}$ is estimated by the index of optimism μ . The larger value of the index μ indicates the higher degree of optimism. The index optimism is a linear convex combination defined as

$$\tilde{a}_{ij}^{\alpha} = \mu \tilde{a}_{iju}^{\alpha} + (1 - \mu) a_{ijl}^{\alpha} \quad \forall \mu \in [0, 1] \text{---(5)}$$

While μ is fixed, following crisp judgment matrix can be obtained after setting the index of optimism μ , in order to estimate the degree of satisfaction.

$$\tilde{A} = \begin{bmatrix} 1 & \hat{a}_{12}^{\alpha} & \dots & \hat{a}_{1n}^{\alpha} \\ \hat{a}_{21}^{\alpha} & 1 & \dots & \hat{a}_{2n}^{\alpha} \\ \dots & \dots & \dots & \dots \\ \hat{a}_{n1}^{\alpha} & \hat{a}_{n2}^{\alpha} & \dots & \dots \end{bmatrix}$$

The eigenvector is calculated by fixing the μ value and identifying the maximal Eigen value.

5. Determining the weights of attributes According to Saaty (1980) weighting vector for each pair wise matrix. the eigenvector is calculated by fixing the μ value and Eigen value the maximal Eigen value or The Eigen value and Eigen vector are calculated[6].

By Normalization of both the matrix of paired comparisons and evolution of priority weights $\lambda_{\max}$ is calculated. To control the results of this

method, the consistency ratio for each matrix are calculated. The consistency is expressed by the following equation.

$$\text{Consistency index (CI)} = \frac{\lambda_{\max} - n}{n - 1} \text{ -----(6)}$$

The consistency ratio is used to estimate the consistency of pair wise comparisons

Where RI is selected from the number of comparisons from the following Table 3.

Table-3

Matrix Rank	2	3	4	5	6	7	8	9	10
RI	0.00	0.58	0.90	1.12	1.24	1.35	1.41	1.45	1.49

$$\text{Consistency ratio (CR)} = \frac{CI}{RI} \text{ -----(7)}$$

If $CR < 0.1$ then acceptable else the original values in the pairwise comparison matrix must be revised by the decision maker.

4. OBSERVATION

Academic stress: The Academic stress is nothing but the workload stress are faced with new personal, social and else academic demands during the transition from secondary school to university, that is stressful for many of them student Academic performance is the single indicator of the quality of time a student spent at school. In the academic environments, higher expectations, information overload, unrealistic ambitions, limited opportunities, and high competitiveness are some of the common sources of stress that create tension in students. homework stress also cause sleep deprivation.

Daily Assessment: homework is also is a one of the most important stress become now a days because now a day's some of the student regularly receive 3times higher amounts of homework in compare to old days, that shows cause of stress and negative health effects that student making sick students whether they experienced physical symptoms of stress, such as headaches, exhaustion, sleep deprivation, weight loss, and stomach problems.

.Grades: Now a days competition and expectation in between the student is very high in compare to old days and parents certainly expecting a good grades from individuals and comparing them with other students in society that brings the student mentally, socially and emotionally weak.

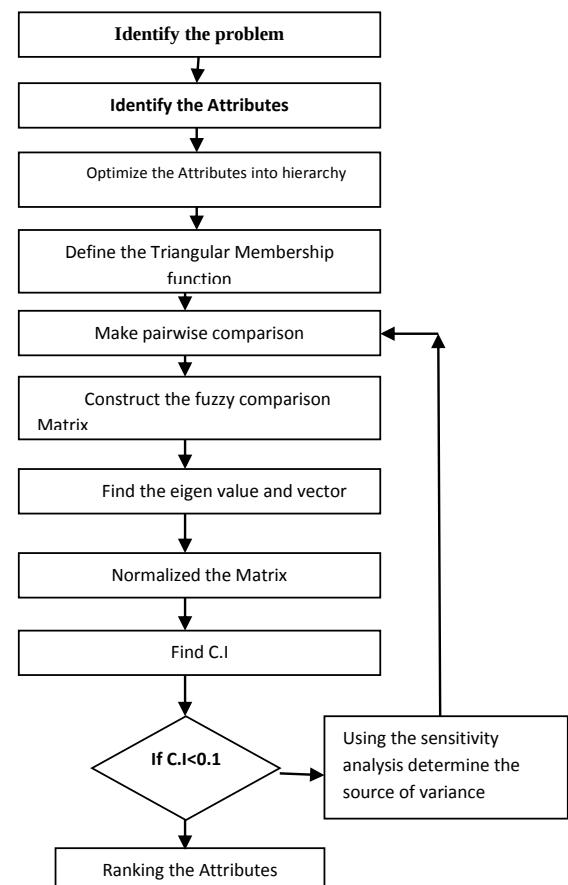


Figure-1 Flow diagram of FAHP

Class: Class room environment plays a significant role in the increasing the stress among the student community. the stress level of the students increases when there is lot of disturbance in the form of noise, music and non availability of ventilation, proper furniture for them to sit and also proper working all electrical equipments like fans and tube lights.

.Attendance: The Attendance is the most important part of the school (or) high school students now days. every student it must to attend the class on time if not, they didn't allow into the class and that cause that hour attendance will not

be given or sometime full day attendance will be cut-off. Now a days every student has must attend the class and maintain the attendance% minimum "75%" attendance, if they not able the management put the fine and some school more strict and punctual they also didn't allow to attend the exam sometimes and negatively affects a student's academic performance also.

Timing: Most of schools in India starts to function very early in morning, because of the inconvenient timing the students are not getting proper sleep, deprived of their sleeping it makes the students irritant, frustrated and angry and also the travelling time to school from their home is a important factor which is again increases the stress levels of the student.

Social stress: social stress is a type of stress that occurs due to the situation or which threatens one's real relationships, or sense of belonging within a something that consists of two elements or parts., or group, larger social context. Social stress can emerge in a number of situations. Social stress can stem from difficult social interactions, for example, College life can be very stressful. Sometimes parents, faculty and others tend to idealize their college experience and remember it as that idyllic time when they had few worries or responsibilities. To students currently attending college, however, the process is often stressful and frustrating. Social stress can also emerge in the context of evaluated performance situations, where others could be judgmental or critical.

Alcohol/Drugs: The use of alcohol and drugs to self-medicate symptoms of posttraumatic stress disorder, The PTSD (Posttraumatic Stress Disorder) is a type of mental disorder issue that developed traumatic event of a person, such as:- sexual assault, warfare or other threats on a person's.

Sexuality: In early days of childhood sexual experience is harmed by a frightening sections, according to other media sex is an adult, exploitation, shame, punishment or pressure into the act (such as incest or rape), then an early sexual experience may lead to sexual dysfunction later in life. Engaging with a sexual activity are peer and distressed by social person which leads to the physiological stress.

Race: Student are living in the Era of modern age, where student life is becoming a race, Is full of

competition and expectation in between the student is very high in every field and activity compare to old days.

Fashion: Students are always attracted towards to the world of fashion. At their age they want experiment and experience the feeling of what fashion has to offer them, like wearing new designs of cloths, and various accessories. But wearing fashionable dress, and various accessories which relates to both gender of students cannot be used when they attending the schools. Because of the rules and regulations of schools they suggest all students should be wearing clothes which are uniform in colour and does not allow the students wear the fashionable accessories.

Sports: Students involving in sports Activities bring a lot of stress in them. Because of the fact that it causes injuries and due to which students are unable to do their regular activities.

Theatres: Students who are interested in theater activities such as acting, composing music, singing, dancing feel the stress when they do not get proper exposure and their talent not get noticed.

Clubs: Nowadays recreation is part of every human life and everyone wants to have a feel and enjoy the environment. One fine example is students are spending more time in various clubs which takes toll on their daily life and brings stress in their young minds.

Leadership: Leaders are not born, but they are made. This statement is well directed at the student community where every student is carefully nurtured to be a leader. Whose qualities of leadership are tested in their school life to become a leader one has to sacrifice a lot. This sacrifice aspect leads students to be stressed.

Parenting style: The parenting style is most important in nurturing a Childs behaviour and development into good human being. And having said that many children especially students are feeling the stress because they do not get the proper care from the parents. This non availability of proper care is due to the fact, most of the parents are employed and they are not able to take care of their wards life and there by children are not given the

affection and love and also guidance from the parents.

Family Income/status: Many parents want their children to lead a comfortable life irrespective of how much they earn for survival .hence children grow without worrying about their responsibility and commitments. But at certain stage of life the students are put under tremendous stress because they are made to realize the status of their family and about their commitments to lead the life responsibly.

Weight: At certain stage of life when the students are growing. The body weight of every individual plays a important role in creating stress among the students. Maintaining one's body weight is a matter of pride .putting on weight once makes the student's life under stress since they are ridiculed by their friends and family.

Physical Appearance: Students once they are in their teenage stage physical appearance takes prominence and the same is the reason for them to be stressed. Because every teenager irrespective of the gender wants to have good looks and expect others to praise their physical appearance. When this does not happen or when they are born with permanent disability brings a lot of stress in them.

Self respects: Every child is brought up in life by their parents and they are groomed to develop the quality of self respect. They are taught from their childhood not to lose self respect by involving in activities which they are not supposed to do .but students are under severe stress when their self respect is tested by various factors.

Diseases: Students in school always have a risk of contracting various diseases like fever, cold, which obviously brings a lot of stress in their minds. Suffering for a longer period of time. Not able to get proper food and sleep dues to the infection. Brings a lot of stress in their minds.

disability: Disability is cause of stress among students because of the fact that they are made fun by their friends both at school as well in their home.

so they feel inferior and develop complex in their minds which affects the students future.

Maturity: Maturity relates to how individual Behaves .many students behave in such a manner where their maturity levels are tested. This again brings a lot of stress when they are made fun of their childish behaviour.

poverty: Poverty is factor which can bring stress to student's life. for example notable pay the fees for their studies, or to spend money for their requirements. Hence they are put under tremendous stress.

Future: Students are made to feel the stress when they think and worry about their future whether their dreams will be achieved or not .which are governed by various factors like money, property and Parental guidance.

Career choices: Students are normally under stress when they think about making career choices. They are in confused state of mind when it comes to choosing a career. This can happen due non availability of choices before them or no guidance of which career one want to pursue in life.

Mentors: Mentors play a major role shaping a student's career. But putting a student under a mentors control is a stress for them. Since they are to made do the works apart from their academics and always under the watchful eyes of their mentor.

Guilt: Committing mistakes are part of life, but when you feel for the mistakes and feel guilty which can bring stress to student's life.

Responsibilities: Students are weighed down by their responsibilities on their young shoulders which normally arise due to their family background, need for money and responsibility of taking care of their family. This brings in a lot of stress in students mind.

Death: Students are stressed when they lose their near and dear and are unable to cope up with the loss of their loved ones. this affects them both mentally and physically .

5.SAMPLE WORK

In level-2 Social stress has nine attributes like Alcohol, sexuality, race, fashion, friends, gossip, love life , social media and environment using the answer of the questionnaires the comparison fuzzy matrix are framed which is given below,

$$M = \begin{bmatrix} 1 & \tilde{3}^{-1} & \tilde{3} & \tilde{3}^{-1} & \tilde{3}^{-1} & \tilde{3} & \tilde{3}^{-1} & \tilde{1} & \tilde{3} \\ \tilde{3} & 1 & \tilde{5} & \tilde{3} & \tilde{3} & \tilde{3} & \tilde{3}^{-1} & \tilde{3} & \tilde{3} \\ \tilde{3}^{-1} & \tilde{5}^{-1} & 1 & \tilde{5}^{-1} & \tilde{5}^{-1} & \tilde{3} & \tilde{5}^{-1} & \tilde{3}^{-1} & \tilde{3}^{-1} \\ \tilde{3} & \tilde{3}^{-1} & \tilde{5} & 1 & \tilde{1} & \tilde{3} & \tilde{5}^{-1} & \tilde{3} & \tilde{3}^{-1} \\ \tilde{3} & \tilde{3}^{-1} & \tilde{5} & \tilde{1} & 1 & \tilde{7} & \tilde{9}^{-1} & \tilde{5}^{-1} & \tilde{5}^{-1} \\ \tilde{3}^{-1} & \tilde{3}^{-1} & \tilde{1} & \tilde{3}^{-1} & \tilde{7}^{-1} & 1 & \tilde{5}^{-1} & \tilde{3}^{-1} & \tilde{3}^{-1} \\ \tilde{3} & \tilde{3} & \tilde{5} & \tilde{5} & \tilde{9} & \tilde{5}^{-1} & 1 & \tilde{3} & \tilde{3} \\ \tilde{1} & \tilde{3}^{-1} & \tilde{3} & \tilde{3}^{-1} & \tilde{5} & \tilde{3} & \tilde{3}^{-1} & 1 & \tilde{1} \\ \tilde{3}^{-1} & \tilde{3}^{-1} & \tilde{3} & \tilde{3} & \tilde{5} & \tilde{3} & \tilde{3}^{-1} & \tilde{1} & 1 \end{bmatrix}$$

After finalizing the fuzzy comparison matrix by the experts, the triangular membership function and α -cuts=0.5 and $\mu=0.5$ are used in this study, substituting the value of $\mu=0.5$ and $\alpha=0.5$ in the equation (3) we get the following Fuzzy comparison Matrix(FCM).

$$FCM = \begin{bmatrix} 1 & \left[\frac{1}{4}, \frac{1}{2}\right] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & [1,2] & [2,4] \\ [4,6] & 1 & [4,6] & [4,6] & [2,4] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & [2,4] & [2,4] \\ \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{6}, \frac{1}{4}\right] & 1 & \left[\frac{1}{6}, \frac{1}{4}\right] & \left[\frac{1}{6}, \frac{1}{4}\right] & [1,2] & \left[\frac{1}{6}, \frac{1}{4}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] \\ [2,4] & \left[\frac{1}{6}, \frac{1}{4}\right] & [4,6] & 1 & [1,2] & [2,4] & \left[\frac{1}{6}, \frac{1}{4}\right] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] \\ [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & [4,6] & \left[\frac{1}{2}, 1\right] & 1 & [1,3] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{3}{2}, \frac{5}{2}\right] & [1,2] \\ \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{2}, 1\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{3}{2}, \frac{5}{2}\right] & 1 & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] \\ [2,4] & [2,4] & [4,6] & [4,6] & [2,4] & [4,6] & 1 & [2,4] & [2,4] \\ \left[\frac{1}{2}, 1\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & [1,3] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & 1 & [1,2] \\ \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{4}, \frac{1}{2}\right] & [2,4] & [2,4] & \left[\frac{1}{2}, 1\right] & [2,4] & \left[\frac{1}{4}, \frac{1}{2}\right] & \left[\frac{1}{2}, 1\right] & 1 \end{bmatrix}$$

The highest value of the index μ gives the highest degree of optimization. And the index of optimum is a linear convex defined by equation (5). The following crisp decision matrix can be obtained from the index of optimism value μ . Here $\mu=0.5$ is used to get fuzzy comparison matrix into a crisp comparison matrix. So the crisp comparison matrix (CCM) obtained after fixing the value of $\mu=0.5$ in the equation (5).

$$CCM = \begin{bmatrix} 1 & 0.375 & 3 & 0.375 & 0.375 & 3 & 0.375 & 1.5 & 3 \\ 5 & 1 & 5 & 5 & 3 & 3 & 0.375 & 3 & 3 \\ 0.208 & 0.208 & 1 & 0.208 & 0.208 & 1.5 & 0.208 & 0.375 & 0.375 \\ 3 & 0.208 & 5 & 1 & 1.5 & 3 & 0.208 & 3 & 0.375 \\ 3 & 0.375 & 5 & 0.666 & 1 & 2 & 0.375 & 2 & 1.5 \\ 0.375 & 0.375 & 0.666 & 0.375 & 0.5 & 1 & 0.208 & 0.375 & 0.375 \\ 3 & 3 & 5 & 5 & 3 & 5 & 1 & 3 & 3 \\ 0.666 & 0.375 & 3 & 0.375 & 0.5 & 3 & 0.375 & 1 & 1.5 \\ 0.375 & 0.375 & 3 & 3 & 0.666 & 3 & 0.375 & 0.666 & 1 \end{bmatrix}$$

When CCM ($\mu=0.5$ and $\alpha=0.5$). The Eigen value and Eigen vector can be obtained from the equation $(A - \lambda I)=0$. The maximum Eigen value is 10.104, Consistency index (CI) = 0.892 and the corresponding Eigen vector can be normalized, the weight of the each attributes and are given below.

S.No	Attributes	Weight	Ranking
1.	Gossip	0.163761	1
2.	Love life	0.156574	2
3.	Friends	0.155383	3
4.	Sexuality	0.11932	4
5.	Environment	0.118735	5
6.	Alcohol	0.0954006	6
7.	Race	0.086557	7
8.	Fashion	0.0598388	8
9.	Social Media	0.0443828	9

6. RESULTS

Based on the literature review of student stress and FAHP . The attributes are identified and make them into hierarchy. In the student stress hierarchy, in level-2 social stress taken as a sample work. Apply FAHP over the social stress and based on the weight the attributes are ranked (Table-2), in that first preference is gossip, second is love life, third is friends, fourth- sexuality, fifth – environment, sixth – Alcohol, seventh is Race, eight is fashion and last one is social media. Similarly in all the level of student stress factors are ranked based on the weight of the attributes.

7.CONCLUSION

School student are put under tremendous stress resulting from the expectation of parents, teachers, relatives, and friends. Due to that student's stress is increasing day by day. In this work, Indian school students stress factors are identified based on the many factors. These factors are categorized in to hierarchy. Using IFAHP student stress factors are ranked in each level. Based on the ranking we can

able to identify which area is affected more for the students.

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