Suicidal Ideation and Coping Strategies among Engineering Students

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Abstract - Suicide and suicidal ideation is a growing concern among behavioral science researchers all over the world due to its multifaceted impacts on personal, social, interpersonal and academic domains. In this ultra-competitive world professional students are encountering various challenges and problems. In India, the technical and engineering education is a trending one which is a major option of many of the students. Getting an employment is one of the biggest challenges the engineering graduates are facing. As a result, emotional and behavioural problems and other mental health issues are on a rise among this population. In this context, this study tried to understand the extent of suicidal ideation and its relationship with various coping strategies adopted by the engineering students. The sample of the study consisted of 72 males and 84 females engineering students in and around Kerala selected through convenience sampling method. Data was collected through survey method. The findings of the study revealed that engineering students have an average level of suicidal ideation, which is alarming. Various maladaptive coping strategies like self-blame, behavioral disengagement, substance use and denial are positively correlated with suicidal ideation and adaptive coping strategy venting is negatively correlated.

Key words: Coping, Engineering students, Suicidal Ideation

I.   INTRODUCTION

In this ultra-competitive world, trends in educational preferences change a lot. The recent transformation of educational sector in our country is an aftereffect of modernization and western culture. Career options for higher education are increasing day by day and the recent trend in higher education was professional courses. Professional education is defined as higher educational programmes that are designed for learners to acquire the knowledge, skills and competencies specific for a particular occupation or grade or class of occupations or trades. Among those engineering is the most widely preferred course by students. According to Accreditation Board for Engineering and Technology, Engineering is the profession in which knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize economically the materials and forces of nature for the benefit of mankind (ABET,2012) [1]. This area of education requires the application of scientific and practical knowledge which combines with technical skills and activities. Hence the competencies required by those students also increases. Hence engineering students are facing a wide range of stressors while pursuing the course and also face challenges in building a better career after completion of courses. According to the annual report of

All India Council for Technical Education, large numbers of students are enrolled in engineering courses but many of them are unemployed after completing the course (AICTE, 2017) [2].

The major challenges faced by the students include their inability to produce effective outcomes offered by their job, not competent enough to handle the core engineering tasks. Problems with English language and computer applications, lack of soft skills. The commonly reported academic problems for professional students includes enormous syllabus, the difficulty in understanding and following of the curriculum activities, competitive nature of courses parental pressure and expectation, long studying hours, and emotional factors like lack of peer support, competitive environment, rigid authoritative and non-encouraging faculty, lack of recreational activities due to tight working hours, staying away from home, financial problems, uncertain future, cultural and minority issues, mismatch between capability and expectation are some reasons of stress (Supe, 1998) [3].

Youth is one of the vulnerable groups to suicides with 33% share of total suicides in India (NCRB, 2014) [4]. Suicide is a complex phenomenon that is influenced by several interacting factors such as personal, social, psychological, cultural, biological and environmental. According to the estimate of World Health Organization (2018) [5], suicide

is the second leading cause of death among 15 to 29-year age group. Since Engineering students comes under this age group, their vulnerability to stress is higher. In 2015, 1589 suicides were reported as result of professional and career problems, 2646 suicides due to examination failures and 2723 suicides due to unemployment (NCRB, 2015) [6]. In this regard beholding the first position in literacy among Indian states Kerala has to be concerned. Number of suicides in Kerala due to unemployment was 29 in 2013 and 58 in 2014 (NCRB, 2014).

Stress is reported to be high among professional students and how they tackle their stressors or their coping mechanism is important in determining their problems. Stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with threats to their well-being. Coping is the process of attempting to manage the demands created by stressful events that are appraised as taxing or exceeding a person's resources (Lazarus & Folkman, 1984) [7]. It involves cognitive and behavioral effort made to master, tolerate or reduce external and internal demands that are created by the stressful transactions. Coping strategies are psychological patterns that individuals use to manage thoughts, feelings, and actions encountered during various situations. Having an efficient collection of coping skills strengthens individual's sense of self-control and self-direction. Coping is a dynamic process with substantial intra-individual and inter individual variability. The way in which an individual conceptualizes stress determines his or her response, adaptation, or coping strategies towards that stressful situation. Coping strategies adopted by each individual vary according to the availability and accessibility of resources and how they perceive it. According to the availability of resources and controllability of event, coping process is differentiated as problem-focused coping or emotion-focused coping (Folkman & Lazarus, 1980) [8]. If the individual does not believe that he or she can respond to the challenge effectively, then they are most likely to choose emotional focused coping or else choose problem focused coping.

The stress systems of the body is interlinked with both mental and physical health risks and act as a risk factor for depression and anxiety disorders, disequilibrium in blood pressure, heart rate etc. Successful coping is directly related to better quality of life, mental health, and illness remission (Aldwin & Park, 2000) [9]. Effective coping processes directly enhance the emotional wellbeing of an individual despite of the stressor (Pottie & Ingram, 2008) [10].

II.   REVIEW OF LITERATURE

Pervin and Ferdowshi (2016) [11] found that suicidal ideation was positively associated with depression, loneliness and hopelessness. Shivaswamy, Nagendra, Sanjay, Goulil and Kalappanavar (2012) [12] found that suicidal ideation was significantly associated with

depressed students, compared to non-depressed students. Takeuchi and Nakoo (2013) [13] found that depressive symptoms like depressive mood, loss of interest, weight loss, psychomotor agitation, concentration loss in academic problems and worthlessness is found to be positively correlated with suicidal ideation. Mackenzie et al (2011) [14] investigated the gender difference of depression and suicide ideation among students and found that suicidal ideation was high among males than females. Davidson, Wingate, Grant, Judah and Mills (2011) [15] found that suicide had significant relation with depression and it was related with burdensomeness and thwarted belongingness. People who commit suicide may have greater inclinations toward self-blame and introversion during early adulthood (Shirley & Ilene, 2010) [16]. It has been found that Stress and self-blame do have a positive correlation with suicidal ideation (Nwankwo, 2016) [17].

Billings and Moos (1984) [18] investigate the combined effects of coping resources and stress in predicting depression and found that depressive symptoms are directly related to both task oriented coping and emotion oriented coping. Jung (1993) [19] found that avoidance coping was related to higher levels of physical and psychological symptoms, whereas problem solving was associated with fewer psychological symptoms. Adaptive coping strategies and it reduces the negative impact of stress over mental health (Suldo, Shaunessy & Hardesty, 2008) [20]. Poor social contacts and deficient coping skills are strong risk factors for suicidal ideation in young students (Tang & Qin, 2015) [21]. Problem focused coping strategies are associated with positive mood states and emotion focused coping strategies are associated with negative mood states (Lerner & Kennedy, 2000; Scheier & Carver, 1992) [22], [23]. Barnes, Ikeda and Kresnow (2001) [24] found that there is a significant positive relationship between maladaptive coping strategies and high levels of suicidal ideation.

Yazon, Ang-Manaig and Tesaro (2018) [25] have found that students those who positively cope with academic stress have better academic performance. Similarly, Vizoso, Rodríguez and Arias-Gundín, (2018) [26] found the mediating role of academic performance and coping and the findings indicate that adaptive coping and academic performance were positively related and maladaptive coping was negatively related to academic performance. Gomez (1998) [27] found helpfulness of different types of coping with academic performance and found that significant degree of association between lower academic achievement and indirect and inactive coping strategies. Loukzadeh and Bafrooi (2013) [28] found out that problem focused coping style is more effective in solving problems and the increased use of emotional focused coping associated with adverse health consequences. Di Benedetto, Linder, Hare and Kent (2007) [29] found that low coping resources is associated with depressive symptoms. Threat appraisal and emotion-focused coping strategies play

significant mediating role between anxiety and depressive symptoms (Howell et al., 2015) [30]. Lack of ability to cope with the daily stressors causes poor performance, low job satisfaction, high burnout, high absenteeism, and high illness (Tang & Hammontree, 1992) [31].

III.   METHOD

Research Design

The primary objective of this study was to find the relationship between suicidal ideation and coping strategies. This study also aimed to identify the extent of suicidal ideation among engineering students. To accomplish this Correlationl research design was used.

Sample

The study was conducted among engineering students in and around Kerala. 156 samples (72 males and 84 females) were collected from the various engineering students were those who are pursuing B. Tech. or B.E courses and those who completed the course within a time period of 5 years. The sample was collected through convenience sampling method.

Procedure

The data was collected from various engineering colleges of Kerala. The researcher approached various engineering colleges and request letter for collecting data was given to the principal or concerned authorities. After getting permission from the authorities the Google form was circulated to students through common mode of communication such as common mail id and social Media platforms like WhatsApp.

Tools used for data collection

1.   Suicidal Ideation Scale (Sisodia and Bhatnagar, 2011) [32]

Suicidal ideation scale is a brief tool developed by Sisodia and Bhatnagar (2011), which aims to measure suicidal ideation. The responses vary according to a five-point likert type scale ranging from strongly agree to strongly disagree. The scale comprises of 25 items of which 21 are positive statements and 4 are negative statements. The reliability of the scale determined by test-retest method is 0.78 and the internal consistency value is 0.81.

2.   Brief COPE scale by (Carver, 1997) [33]

The Brief COPE (Carver, 1997) is a 28 item self-report questionnaire used to assess various coping strategies. It is made up of 14 subscales which includes self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral

Table 2

Spearman's correlation of suicidal ideation and coping strategies of the participants.

disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Each subscale has 2 items. Reliability and validity exceeded the value of 0.50.

Statistical analysis

Different statistical measures were used to analyze the data. Data collected for this study were analyzed using descriptive statistics, spearman's rank order correlation, Mann Whitney U Test. Spearman's rank order correlation was used to find out the relationship between suicidal ideation and coping strategies. Mann Whitney U Test was employed to find out whether there is any significant statistical difference in suicidal ideation with respect to the selected socio demographic variables such as gender, mode of stay, presence of backlog papers.

IV.   RESULTS AND DISCUSSION

Table 1

Extent of suicidal ideation among engineering students.

Level of suicide	Frequency	Percentage
Very low SI	1	0.6
Low SI	83	53.2
Average SI	72	46.2

The table 1 indicates that 53.2% of engineering students is having low level of suicidal ideation where 46.2% is having average level of suicidal ideation and 0.6% is having very low level of suicidal ideation. Since the findings indicate that 53% of engineering students is having low level of suicidal ideation. Meanwhile 46% of the population is having average level of suicidal ideation which is highly alarming. According to ecological model of suicide various personal, interpersonal, and socio cultural factors are contributing to suicidal behaviors. It further implies that engineering students is encountered with various psycho social stressors such as academic pressures such as work overload, competitive environment, tight working schedules and the expected outcome of works exceeds the potentials and skills of the students and this may lead them to suicidal thoughts and behaviors. According to interpersonal theory of Thomas Joiner, thwarted belongingness and perceived burdensomeness are the two interpersonal constructs that are capable of triggering suicide thoughts. Thwarted belongingness is the misperception of the individual regarding the low sense of belongings from others and experienced an alienated feeling from family, friends and other valued people. They might also experience a feeling of burden to family because they are not able to fulfill the academic demands as expected by parents and cannot reimburse their financial loses. This finding is in accordance with Davidson, Wingate Grant, Judah and Mills (2011).

	S.I	S.D	A.C	D.L	S.U	E.S	I.S	B.D	V.T	P.R	P.L	H.R	A.C	R.L	S.B
S.I	1														
Self-distraction	0.00	1													
Active coping	-0.6	.46	1												
Denial	0.21**	.26	.29	1											
Substance use	0.19*	.20	.02	.36	1										
Emotional support	-.01	.33	.45	.40	.12	1									
Instrumental support	0.08	.31	.38	.35	.08	.64	1								
Bhvrl. disengagement	0.26**	.35	.22	.44	.43	.46	.29	1							
Venting	-.24**	.31	.36	.47	.32	.51	.45	.45	1						
Positive reframing	-.02	.38	.62	.33	.01	.55	.43	.25	.37	1					
Planning	0.13	.27	.58	.35	.06	.43	.49	.29	.51	.58	1				
Humour	0.03	.16	.31	.32	.26	.33	.31	.30	.33	.42	.38	1			
Acceptance	0.08	.30	.53	.30	.03	.40	.47	.18	.42	.57	.58	.43	1		
Religion	0.14	.05	.32	.39	.09	.42	.40	.20	.45	.33	.42	.26	.38	1	
Self-blame	0.37**	.25	.30	.42	.25	.42	.41	.43	.52	.39	.34	.30	.34	.36	1

** Significant at the 0.01 level

* Significant at the 0.05 level

Another major objective was to find out whether there is a significant relationship between suicidal ideation and coping strategies. The findings indicate that the maladaptive coping strategies like self-blame, behavioral disengagement, denial, and substance use are positively correlated and adaptive coping strategy like venting is negatively correlated with suicidal ideation. This may implies that coping strategies have a role in determining the suicidal ideation of engineering students. Every individual follow their own ways in dealing with stressors and these had an effect on their suicidal thoughts and behaviors. Maladaptive coping strategies are ineffective and problematic in nature. Therefore such strategies may not help the individual to cope with the stress in an adaptive manner and can further create severe distress within the individual. This implies that suicidal ideation increases with maladaptive coping strategies like self-blame, behavioral disengagement, denial, substance use and decreases with adaptive coping strategy like venting.

While considering 'self-blame' coping strategy it is positively correlated with suicidal ideation among the population. This finding is in line with findings of Shirley and Ilene (2010) and Nwankwo (2016). Another study concludes that self-blame is positively correlated with suicidal ideation and negatively with emotional adjustment (Aldwin & Park, 2004). In 'self-blame' coping strategy the individuals attribute stressful events and problems to themselves and their inefficiencies. This may diminish their self-esteem and belief in their abilities to meet challenging life demands. Since they may attribute their in competencies and problems in meeting academic demands as their own mistakes and faults. Their belief of incapability and lack of competencies in encountering the upcoming challenges may create negative feeling or distress as well as emotional maladjustment among them. According to cognitive theory of suicide negative cognitions can instigate suicidal thoughts.

The coping strategy 'behavioral disengagement' is also a maladaptive as well as passive coping strategy in which the individuals try to distract themselves from the stressor by focusing on other activities. People who adopt behavioral disengagement as a coping strategy will take less efforts to deal actively with a stressor. Such individual may not experience stress directly but it may act as residual factor and affect other domains of life. This might negatively influence their psychological wellbeing. This finding was in line with the findings of Dijkstra and Homan (2016) [34]. According to cognitive relational and motivational theory of coping by Lazarus and Folkman, coping process is a product of cognitive appraisal of the individual and it includes the threat appraisal and availability of resources. This implies that the way in which engineering students perceive their stressors and challenges had a great role in their coping mechanisms. Hence they might perceive adverse stressful conditions as threatful and follow coping mechanisms accordingly. Behavioral disengagement coping strategy shows an escape mechanism of coping. This theory also indicates that threatful appraisal and availability of resources had significant role in adopting various coping strategies. If the stressor is perceived as threatful and if the resources are also lacking then the individual is likely to adopt emotion focused coping strategies. Since there is no preplanning for executing action and only tries to reduce negative emotions one or other way and hence behavioral disengagement falls under the category of emotion focused coping strategy (Portello & Long, 2001) [35]. Hence it can be inferred that the engineering students might perceive the stressful situation as threatening and they believe that their resources especially psychological are not enough to handle the stressors. Hence they adopt passive mode of coping without addressing the actual stressor. The problem remains unresolved and in course of time it gets accumulated and thus higher chances in creating emotional, psychological maladjustment.

Similarly 'denial' coping strategy is also a maladaptive coping strategy in which the individuals refuse the truth without accepting it. It requires greater psychic energy to deny the existing fact and behave freely without accepting the reality and truth. Hence they may be in a delusional world and society won't accept this as such denial of reality. Sometimes society labels the individuals as not normal since they are in a delusional world without accepting the truth. Thereby the individual may feel detached from the society. According to Three step theory of suicide by Klonsky and May, individuals having ability to carry out suicide and have feelings of hopelessness and less connectedness can develop suicidal thoughts behaviors. Due to denial mechanism the individual may feel less connectedness and this might contribute in creating suicidal ideation.

Another findings indicate that 'substance use' mode of coping is found to be positively correlated with suicidal ideation. Substance use is associated with wide range of short term and long term consequences in thoughts, emotions and behavior as well as ripple effect on family, social and personal life of the individual. It creates severe changes in individual over time, it affects the brain biochemistry. Drugs can stimulate the activity of dopamine which stimulates the reward pathway, and provides overstimulation and reinforcement for this behavior of drug use and these lead to dependency over it. In course of time substance use can induce several changes in thought pattern and behavior such as impaired judgment and problem solving skills, impulse control, mood swings, affect concentration and memory. It also weakens the immune system of body and thereby increases the chances of getting diseases. The drugs can affect the brain functioning by interfering the communication system of neurons because certain chemicals mimic the neurotransmitters in the brain and block communication system. Another major consequence of drug use was disruption of sleep cycle and creates sleep problems. More over there is a strong positive correlation between substance use and risky behaviors. These after effects and consequences of substance use act as a contributing factor for suicidal ideation. Findings shows that engineering students using 'substance use' as a coping mechanism to resolve their problems and hence there are higher chances for them to develop suicidal ideation.

Another finding indicates that there is a significant negative relationship between suicidal ideation and 'venting' coping strategy. This indicates that suicidal ideation decreases with the use of this adaptive coping strategy. Emotional venting is an effective and adaptive way of coping with stress and it paves a great relief from the built up tension. This indicates that the engineering students might express their emotional distress and problems through various mode of venting. It may include talking with significant other about their problems and distress, crying, doing artistic works, writing etc. these activities might provide the students a better relief from their stress, since their focus is shifting to various other areas. Family support and peer support plays a major role in expressing their problems and emotional distress. Since 'venting' is the only adaptive coping mechanism among this population, they might have better options to ventilate their emotions. . Since India is following collectivistic culture where family system had a great influence over individuals and thus it provide the engineering students a better environment to express and ventilate their feelings and worries. This result is in line with the findings of Sinha, Willson and Watson (2000) [36].

V.   IMPLICATIONS

Suicide has continuing ripple effects on an individual's personal, academic, Professional, interpersonal domains of life. It has long lasting impacts over the individual's family and work environment. Suicide of a young individual will create economic losses for family and nation. The average level of suicidal ideation among the engineering students is an indicator and vulnerability of them towards suicidal act while encountering stressors. Suicidal ideation creates a sense of being alone, no meaning and purpose for life and this may lead to psychopathological conditions like anxiety, depression etc. Suicidal ideation also diminishes the self esteem, self confidence and motivation level and it may negatively impact their academic career.

VI.   RECOMMENDATIONS

Suicide prevention programmes can be conducted in the institutional level to prevent the students from suicidal behaviors. A trained psychologist can conduct various levels of prevention programs including the teachers, students as well as parents. Also, professional training can be given to students for providing peer counseling for their friends those who are suffering with suicidal thoughts. In addition, programs for developing adaptive and effective coping strategies for dealing with stressors and challenges can be included in the curriculum. Furthermore, programs for enhancing their skills and competencies required by the engineering students in fulfilling their academic and professional life can be included in their curriculum.

CONCLUSION

The findings of present study underline the importance of coping strategies in reducing suicidal ideation among engineering students.   It further implies that adaptive coping strategies can act as a protective factor of suicidal ideation. This indicates the need of including effective coping skills training in the curiculum to deal with stressors among the engineering students.

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