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Study of Mechanisms of Coping, Resilience and Quality of Life in Medical Undergraduates

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Abstract

Introduction: The period of undergraduation in the medical field is challenging, and the medical student is exposed to various stressors. **Aims and Objectives:** This study was designed to identify the mechanisms of coping, resilience and quality of life (QoL) and their correlations in medical undergraduates, so as to find some factors which can help to make some positive changes in medical curriculum. **Methodology:** Totally, 250 medical students representing all academic years of medical college were provided with questionnaires investigating their sociodemographic profile, coping skills, resilience, and QoL. Using appropriate statistical tests, the parameters were studied along with a search for the factors affecting them. A comparison of all these factors was also done among the students of all the academic years of medical school. **Results and Discussion:** Problem-solving and fatalism was more in immigrant students than native students of Mumbai. Problem-oriented mechanisms of coping, resilience, and QoL were higher in students doing internship. However, students of 3rd year part 2 were less resilient, used emotion-focused ways of coping and had a lower QoL. There was a good shift of positive ways of handling stress with an increase in the academic year. Problem-oriented mechanisms of coping positively correlated with resilience and QoL. High resilience was also found as a positive factor for good QoL. **Conclusion:** Along with the clinical component, an equal emphasis should be given to improve the social and personal life of a medical student helping them to cultivate more problem-based coping and increasing their resilience so as to ultimately improve their QoL.

Key Words: *Coping, medical undergraduates, quality of life, resilience*

Introduction

An individual accepted into a medical college and enrolled in an educational program in medicine, with the goal of becoming a doctor, is referred to as a medical student. They are considered to be at the earliest stage of the medical career pathway.

The phase of an undergraduation may expose the student to many challenges. Stress, the disease of the newer generation affects medical students also. Many factors are responsible for the development of stress in medical students such as moving away from home for the first time, which can necessitate leaving all previously learned support systems such as parents, siblings and high school friends, developing entirely new social contacts, taking responsibilities for their own needs, increased expectations, a higher academic competition, unable in managing time, and particularly important is the clinical component. Studies indicate that nursing students are more prone to stress than other students.[1]

Failure to resolve student's stress in the long-term could have serious professional and personal consequences.[2] However, there is huge variation in an individual's responses to the environmental stresses and adversities.[3] Mechanisms of coping, resilience in relation to these adversities are important to judge individual's variation in response and to know how much is one prone to these disorders that also affect the quality of life (QoL).

Assessing coping skills are important to know strength within, which can influence intervention strategies and goals in life. Resilience has profound implications for people's concept of themselves, especially after a severe stressor event. It helps to know about stress adaption and has important implication for public policy, e.g., how to best treat depressive students who failed in exams.

Quality of life helps to know how one is connected to one's own environment and whether one achieves one's personal

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goals, hopes, and aspirations that is, it helps to know the feeling of "being", "belonging", and "becoming.

Review of Literature

Due to alarming increase in student's depression[4,5] and suicidal tendencies,[6,7] identification of protective personality characteristics have become essential to determine the students at risk and to develop and evaluate intervention programs. A study reported that despite changes in terms of medical advancements and sophisticated systems of teaching such as the use of case and problem-based learning systems, becoming a doctor is still a complex and intense process.[8] The mental status of a medical student depends on various factors. Identification of these factors has been a topic of research for many enthusiastic researchers and is the objective of this study also.

Mechanisms of coping

Folkman and Lazarus have defined coping as a person's constantly changing cognitive and behavioral efforts to manage an encounter appraised as stressful. The coping mechanism is also described as any effort directed to stress management, including task-oriented and ego defense mechanisms, the factors that enable an individual to regain emotional equilibrium after a stressful experience. It may be an unconscious process.[9] The process of coping is a very complex response that occurs when an individual attempts to remove stress or a perceived threat from the environment.[10] Thus, coping can be viewed as a stabilizing factor that may assist individuals in maintaining psychosocial adaptation during stressful events; quite a few scales are also available to measure coping.[11,12]

Psychological coping mechanisms are commonly termed as coping strategies or coping skills. Coping strategies are generally clustered into two broad categories: Problem-focused and emotion-focused ways of coping. Problem-focused coping is the way of working actively to alleviate the stressful person-environment relationship by changing circumstances. Emotion-focused coping, in contrast, involves efforts to regulate the internal emotional consequences of stressful or potentially stressful events rather than change the events themselves. This strategy involves thoughts and/or actions that relieve or lessen the emotional impact of stress.[13] The expressive action and problem-solving are the problem-focused mechanisms of coping while escape avoidance, fatalism, and passivity are emotion-focused mechanisms of coping. Coping strategy cannot be defined as purely problem-focused or emotion-focused. In reality, any coping thought or act can serve as both. However, in general, when stressful conditions are viewed by a person as refractory to change, emotion-focused coping predominates; when they are appraised as controllable by action, problem-focused coping predominates.[14] Coping is highly contextual, since, to be effective, it must change over time across different stressful conditions. Therefore, a shift can be seen between main coping strategies of a person over the course of time.[15]

A large body of research has accumulated in the past three decades[16] demonstrating that coping is a crucial determinant of psychological well-being with its outcome depending largely on the types of strategies employed.[17,18]

Studies have proved that higher levels of coping skill is associated with higher levels of positive adjustment[19] and lower levels of symptoms of burnout.[20] Coping flexibility has also been found to be associated with decreases in anxiety symptom severity and increases in QoL when followed up for a 2 months interval.[21] Coping flexibility is also associated with a decreased likelihood of experiencing increases in depressive symptoms following the occurrence of stressful life events.[22] On the other hand, lower levels of coping flexibility have been found to predict increases in depressive symptoms over time.[13] Studies from developing countries like Pakistan,[23] India,[24] Thailand[25] and Malaysia[26] have reported stress among medical students and have underscored the role of academics as a source of stress. However, the data on mechanisms of coping in medical students of these countries are lacking.

Resilience

Resilience is the positive capacity of people to cope with stress and adversity. This coping may result in the individual's "bouncing back" to a previous state of normalcy or using this exposure to the adversity to produce a "steeling effect" and function better than expected.[8] Resilience also includes other factors such as the capacity to make realistic plans, having self-confidence and a positive self-image, developing communication skills and the capacity to manage strong feelings and impulses.[27] Resilience may refer to either the state of well-being achieved by an at-risk individual (as in "he or she is resilient") or to the characteristics and mechanisms by which that well-being is achieved (as in "he or she shows resilience to a particular risk").

Studies outside of the medical school context have identified additional resilience factors (e.g., religious faith, social support, and optimism) that may mitigate the effects of stressful events on well-being.[28]

Although researchers may disagree on a single definition and the network of constructs surrounding resilience, most researchers agree that resilient individuals share similar mental health and social outcome.[29,30] These outcomes include higher intelligence, lower novelty seeking, lower affiliation with delinquent peers and an absence of externalizing behaviors, substance abuse, and juvenile delinquency.[31] Resilient individuals have also been described as possessing an internal locus of control,[32] meaningfulness,[33] ego strength,[34] self-efficacy,[33] confidence,[35] perseverance[36] problem-solving skills[30] and

flexibility.[37] Such outcomes can be interpreted as being indicative of greater levels of mental health and highlight the importance of this personality characteristic.

Despite the passing of two decades since Rutter's[38] original statement, little progress has been made in the understanding of resilience mechanisms. Whether coping may contribute to positive psychosocial resources such as resilience is unclear, although one of the studies[39] has found that those with higher self-efficacy and optimism showed more active coping behavior.

Quality of life

World Health Organization (WHO) defines QoL as "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment". QoL is measured in terms of an individual's perception and level of satisfaction about their life. Other factors include culture, values, goals, expectations, standards, and concerns.

Eckleberry-Hunt *et al*., 2009[40] have argued that several factors can influence lowered QoL and lead to burnout symptoms. These include lack of social support, depression, and disempowerment and sleep deprivation.

Issues linked to the notion of QoL among medical students have also been well-documented.[27,41-45] A previous study has also stated that medical students are more likely to manifest depressed symptoms than their nonmedical peers.[44] A western study has disclosed that 21% of the US respondents indicated depressed states of mind, which was significantly higher than those found in the general population (8–15%).[46] Furthermore, reports for suicidal ideation were higher in student years with a peak at 4th year of 9.5% (as opposed to 6.6% in year 1) and lower rates in later postgraduate years.[45] A study from India also revealed depressive symptoms, performance anxiety, panic symptoms were common psychological symptoms seen in medical students who had failures in the 1st year of MBBS.[46] A study in Croatia revealed female medical students had greater stressful effect with contacts with patients and autopsies.[47] These data clearly tell that QoL in medical undergraduates has always been on a lower side as compared to other students.

To conclude, Medical students need to have a sense of being motivated to learn if they are to complete successfully their intense time of study and if they are to continue with their studies in their professional lives as doctors.[48] As such, medical students need to ensure a functional level of QoL if they are to maintain their motivation to learn throughout their professional life.[49]

Aims and objectives

- To study sociodemographic profile in medical undergraduates
- To study mechanisms of coping, resilience and QoL in medical undergraduates
- To study correlations among them.

Methodology

Sample and setting

A cross-sectional study was conducted on 250 students of MBBS stream of Topiwala National Medical College within a period of 2 months.

Inclusion criteria

Medical undergraduates (MBBS stream) who gave consent for their participation in the study.

Exclusion criteria

(1) Students who were not willing to participate in the study. (2) Those who were suffering from severe medical or psychiatric illnesses.

Ethical consideration

Approval of institutional Ethics Committee was taken before initiation of the study. A proper written informed consent was taken from all the participants of the study.

Instruments

Semi-structured proforma

Mechanisms of coping scale

Devised by Parikh *et al*.[50] is a 30-item instrument derived from the "Ways of Coping Scale" by Folkman and Lazarus. Selected items of the original scale as well as 6 items relating to Fatalism are incorporated. The 30 items are divided into five factors that relate to five individual ways of coping viz. Escape avoidance, fatalism, expressive action, problem-solving and passivity.

The scale was filled by the subjects, and the scores were computed for each of the five factors. Then mean factor score was calculated. The averages of these scores were determined across the subjects. This is a time-tested method of scoring coping data.

Resilience scale

The personality characteristic of resilience can be assessed using the 15-item Resilience scale (RS). The RS used in this study is a modification of Wagnild and Young's[51] 25-item RS. The modified scale consists of positively stated self-descriptions to be responded on a 7-point Likert type response scale, ranging from 1 (Strongly Agree) to 7 (Strongly Disagree). Overall resilience was determined by totaling the respondents' responses and then dividing by the number of items to obtain a mean resilience score. These

responses were recoded, so that a high score indicated a high level of resilience, with 7 being the maximum possible score.

World health organization quality of life-BREF Scale

It is an abbreviated version of WHOQOL 100 scale, containing 26 items each rated on a 5-point Likert scale. It measures QoL in 4 domains - physical, psychological, social relationships and environmental; along with two items from the overall QoL and general health facet. Domain scores are scaled in a positive direction (i.e., higher scores denote higher QoL). The mean score of items within each domain is used to calculate the domain score. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100. The raw scores can then be converted into transformed scores to obtain the domain scores in the range of 0–100. The scale has high internal consistency (Cronbach alpha = 0.94)

Procedure

Subjects were selected consecutively on the basis of inclusion and exclusion criteria giving them the right to opt. Information sheet, consent form, and various questionnaires were provided to all the subjects to judge their mechanisms of coping, resilience and QoL.

Statistical analysis

Analysis of data was done using appropriate statistical methods. SPSS (SPSS Inc. Released 2006. SPSS statistics for Windows, Version 15. Chicago: SPSS Inc.) was used for analysis were used for analysis. For analyzing significance between two groups, Mann–Whitney U-test was applied. For more than 2 groups, Kruskal–Wallis test was applied. Significance was taken at 0.05 level. Correlations were determined using Pearson correlation test.

Observations and Results

Sociodemographic profile

A total of 250 students took part in the study. The sociodemographic profile of students was assessed. Students in the age range of 21–23 years formed the bulk of the study. About 78.4% were males while 21.6% were females. About 30% of the students were the local habitants of Mumbai while 69% were immigrants that included those staying in hostel and with other guardians. Most of the students (91.2%) were from nuclear families. About 8.4% students revealed that they selected the career because of compulsion. 85.2% students were satisfied with their accommodation while the rest were not satisfied. About 38% students exercised for <1 h in a week and only 22.8% students exercised more than 5 h a week. About 12.8% students revealed that they some or other problems at home.

Assessment of mechanisms of coping

Analysis of mechanisms of coping in students of various years of MBBS

The mean scores of the parameters and the number of students above and below the mean score was counted as shown in Table 1. A comparison of the percentage of students of the same batch showing scores more and less than the mean was also done. The results that were obtained are: Escape avoidance was found to be least in interns, and the number of students below the mean was increasing along with the academic year except for the students of 3rd year part 2 showing a higher count. However, the results of fatalism were found to be variable being very less consistent with the academic year. The number of students above the mean score in expressive action increased with the academic year except for a higher score in 1st year students. The results that were obtained on analyzing the problem-solving mechanism of coping were similar to that of expressive action with 1st year and interns being the maximum in showing scores above the mean. The results of passivity were also higher in 1st year students, but the interns showed the least value in passivity scores. Overall the scores of problem-oriented mechanisms of coping that is, problem-solving and expressive action was more in interns and the 1st year students. From the 2nd academic year, the students showing lower scores were more in number but the number of students showing higher scores was increasing along with the academic year for problem-oriented coping skills. Analysis of escape avoidance and passivity showed that the usage of these strategies was decreasing except for high levels in 3rd part 2 students. The results obtained on analyzing the fatalism were variable.

Table 1: Mechanisms of coping in students of various years of MBBS

Year	Escape avoidance (%)		Fatalism (%)		Expressive action (%)		Problem-solving (%)		Passivity (%)	
	<5.58	More than 5.58	<6.8	More than 6.8	<8.3	More than 8.4	<9.0	More than 9.10	<7.10	More than 7.2
1st year	41.67	58.33	59.10	40.90	50.00	50.00	40.90	59.10	27.30	72.70
2nd year	45.00	55.00	40.00	60.00	65.00	35.00	72.50	27.50	45.00	55.00
3rd year part 1	58.24	41.76	70.30	29.70	57.10	42.90	50.50	49.50	46.20	53.80
3rd year part 2	50.77	49.23	56.90	43.10	50.80	49.20	52.30	47.70	44.60	55.40
Internship	63.33	36.67	46.70	53.30	26.70	73.30	43.30	56.70	56.70	43.30
Total	133 (53.20)	117 (46.80)	146 (58.40)	104 (41.60)	131 (52.40)	119 (47.60)	131 (52.40)	119 (47.60)	113 (45.20)	137 (54.80)

MBBS: Bachelor of medicine and bachelor of surgery

Comparison of mechanisms of coping in males and female

The comparison of mechanisms of coping in males and females revealed the following results. The mechanisms of coping did not differ significantly in males and females except for expressive action. On comparing the mean and median, it was found that Expressive action of coping was more in males as compared to females.

Frequencies of mechanisms of coping in native students and immigrant students

The frequency of mechanisms of coping in native students and immigrant students was calculated. The difference in fatalism and problem solving between students of Mumbai and immigrant students was statistically significant.

Assessment of resilience

A comparison of resilience in students of various years of MBBS was carried out as years of MBBS [Table 2].

The resilience scores of students of various years were compared within themselves and the results that were obtained are.

It was seen that the percentage of students above the mean scores is increasing as the academic year advances except for a decline in part 2 of 3rd year. The difference in resilience score of males and females was not found to be statistically significant. The difference in relation with colleagues and its relation with resilience score was found significant. Those students whose relation was very well with colleagues were found to have more resilience.

Assessment of quality of life

The frequencies of the four domains of quality of life and the total scores was calculated as shown in Table 3.

D1 = Physical domain
D2 = Psychological domain
D3 = Social domain
D4 = Environmental domain

Total QOL = A score relating to overall quality of life and general health.

Obtained by adding D1, D2, D3, and D4.

A comparison of quality of life in students of various years of MBBS revealed that the results were not the same in all academic years as shown in Table 4.

It was seen that the results were not same in all academic years. The interns showed a high QoL as compared to all other batches while the number was least in 2nd year students. Satisfaction with accommodation and its relation to QoL was found to be significant. The students who were satisfied with accommodation showed higher scores of QoL. Difference in problems at home and its relation to QoL was also found significant. Students with problems at home showed a poor QoL as compared to those with no problems at home. The students who did more exercise shower higher mean scores of QoL and the overall difference was found to be statistically significant.

Table 2: Comparison of resilience in students of various years of MBBS

Year	Resilience (%)		Total (%)
	<4.61	More than 4.62	
1st year	54.5	45.5	100.0
2nd year	47.5	52.5	100.0
3rd year part 1	39.6	60.4	100.0
3rd year part 2	52.3	47.7	100.0
Internship	26.7	73.3	100.0
Total count	110 (44.0)	140 (56.0)	250 (100.0)

MBBS: Bachelor of medicine and bachelor of surgery

Table 3: Frequencies of the four domains of QOL and the total score

Domain	Mean	SD
D1	70.04	12.620
D2	68.00	13.224
D3	65.99	14.104
D4	67.78	13.403
Total QOL	269.66	47.073

QOL: Quality of life, SD: Standard deviation

Correlational analyses

Correlation of escape avoidance with resilience score and quality of life domains

No significant relation between escape avoidance and other parameters except for a negative correlation with Physical domain D1 at 0.05 level.

Correlation of fatalism with resilience score and quality of life domains

Analysis showed a negative correlation of fatalism with resilience, physical domain D1, Environmental domain D4 and Total QOL.

Correlation of expressive action with resilience score and quality of life domains

Analysis showed a positive significant correlation of expressive action with resilience at 0.01 level.

Correlation of problem-solving mechanism of coping with resilience score and quality of life domains

After analysis, it was found that problem-solving mechanism of coping bears a positive correlation with resilience and all domains of QoL.

Correlation of passivity with quality of life domains

It was found that there was a negative correlation of passivity with all domains of QoL.

Table 4: Comparison of QOL in students of various years of MBBS

Year	Total QOL (%)		Total (%)
	<270	More than 271	
1st year	45.5	54.5	100.0
2nd year	65.0	35.0	100.0
3rd year part 1	36.3	63.7	100.0
3rd year part 2	58.5	41.5	100.0
Internship	20.0	80.0	100.0
Total count	113 (45.2)	137 (54.8)	250 (100.0)

QOL: Quality of life

Table 5: Correlation of resilience with QOL domains

	D1	D2	D3	D4	Total QOL
Resilience					
Pearson correlation	0.472**	0.582**	0.318**	0.311**	0.467**
P	<0.001	<0.001	<0.001	<0.001	<0.001
n	249	248	247	248	250

QOL: Quality of life

Correlation of resilience with quality of life domains

As in Table 5, the quality of life domains showed a positive correlation with resilience scores at 0.01 level.

Discussion

The present study was cross-sectional study, the sociodemographic profile, mechanisms of coping, resilience, and QoL in 250 medical undergraduates of various years.

Sociodemographic profile

Students in the age range of 21–23 years formed the bulk of study that was about 59.6%. As most of the students of 3rd years (part 1 and part 2) and interns fall in this range, the participation rate was high from this group. About 78.4% of students were males while only 21.6% were females. Lower sex ratio, less girls taking on higher studies and overall unwillingness of girls to reveal information or take part in study was responsible for less number of girl participants.

Mumbai being a major location for many of the educational institutes of state and country, most of the students come from surrounding places to seek education. This was revealed from the study also which showed a higher number of immigrants (69%) as compared to only 31% of students who were native inhabitants of Mumbai. About 91.2% students belonged to nuclear families, and 94% students belonged to middle class.

Among 250 students, only a single student that is, 0.4% belonged to low socioeconomic status. This low number of admission may be due to the long duration of medical courses as compared to other fields which lead to more number of poor students taking courses other than medicine or due to unrevealing of one's low socioeconomic status as a simple subjective question was asked rather than using an objective scale to know the socioeconomic status.

Of 250 students, 21 students took medicine due to compulsion. Also, 14.8% students were not satisfied with their accommodation. This dissatisfaction may affect the QoL of the students.

The questionnaires that were distributed also contained some questions regarding the lifestyle of students. It was found that 38% students exercise for <1 h in a week, and only 22.8% of students exercise more than 5 h a week. Higher burden of studies in the medical curriculum may be one of the factors for students spending less time in exercises. About 74% students spent more than 10 h a week in recreation. About 12.8% students revealed that they had some or other problems at home. However, this information depends on revealing of participants about their own problems and addiction.

Mechanisms of coping

On analysis, it was found that the scores of problem-oriented mechanisms of coping that is, problem-solving and expressive action was more in interns and the 1st year students. In the 2nd academic year, the students showing lower scores were more in number. The number of students showing higher scores was increasing along with the academic year. Analysis of escape avoidance and passivity showed that the usage of these strategies was decreasing with an increase in academic year except for high levels in 3rd year part 2 students. Thus, the problem-oriented way of coping was increasing as the academic year was advancing from 2nd year. The scores of the problem-oriented way of coping are found to be higher in 1st year students, but a sudden decline was seen in the 2nd year students. The students in 2nd year of MBBS are exposed to clinical component that is a phase of transition from classroom reading to patient caring art, which most of the students find it stressful. This sudden transition may be due to the clinical component that may be responsible for students of 2nd year showing less effective ways of coping. The Mechanisms of Coping were not effective in 3rd year part 2 students also. Both problem-oriented and emotional-based mechanisms of coping were used by these students. The reason can be the burden of clinical subjects like internal medicine, surgery and other subjects in this year. It was observed by Lazarus[14] that when stressful conditions are viewed by a person as refractory to change, emotion-focused coping predominates; when they are appraised as controllable by action, problem-focused coping predominates. Coping is highly contextual, since, to be effective, it must change over time across different stressful conditions. In a study done by Folkman and Lazarus in 1995, it was found that a shift can be seen between main coping strategies of a person over the course of time. The shift that is seen in the

students of various years in this study might have occurred in response to change in burden of studies and stress in one's life.

A shift from an emotion-focused coping strategy to a problem-focused coping strategy is a desired change in student, whereas the reverse is not. The shift from problem-focused to emotion-focused coping in some students or decrease in problem-focused coping scores over time may occur due to reasons such as depression or problems. If we gather data on the depressive status of participants using a depression scale, we can explain this undesired shift. Thus, lack of explanatory efforts to reveal the reasons for the shift from problem-focused to emotion-focused coping is the limitation of this study.

In the present study, it was found that the Mechanisms of Coping did not differ significantly in males and females except for expressive action. On comparing the mean and median, it was found that Expressive action strategy of coping was more in males as compared to females. Earlier studies also indicated that there were gender differences in the sources of stressors, but gender differences in coping were relatively small after controlling for the source of stressors.[52] A study done by Ramya and Parthasarathy in 2009,[53] also revealed that the students irrespective of their gender, used combination of problem-focused and emotion-focused coping strategies. It was also observed that the female students used emotion-focused coping strategies and sought more social support than males.[53] The present study also revealed that the Expressive action strategy of coping was more in males than females, thus males taking more of problem-oriented way of coping. Another study revealed that male students use more active coping strategies, alcohol/substance use and self-blame.[54]

Analysis was also done to compare the mechanisms of coping in immigrant students and students of Mumbai and it was found that the fatalism and problem-solving scores were higher in immigrant students, and the difference was also statistically significant. Creado[55] reported studies outside medical context showed that these two ways of coping are used more by individuals. Immigrant students stay away from homes in hostels or with their guardians. Thus, they handle most of the stress on their own without seeking much help from families except for some reasons. This may be the reason for more problem-solving way of coping being used by immigrant. Immigrants also showed more fatalism attitude. Generally, as Indians, we are fatalistic and usually look for divine intervention in a crisis. A different cultural context such as an urban population may be responsible for the native students of Mumbai being less fatalistic. Another study assessed the coping strategies commonly used by medical students in and found positive reframing, planning, acceptance, active coping, self-distraction, and emotional support as the coping strategies.[54]

Coping strategies can be modified by educational and therapeutic interventions. Training in how to use healthy ways of coping should be provided in medical school, through the implementation of stress management courses.

Resilience

One of the aims of this study was to study the resilience in medical undergraduates. On analysis, it was seen that the percentage of students above the mean scores was increasing as the academic year advanced except for a decline in part 2 of 3rd year. Thus, a positive shift was occurring in continuation with year of MBBS except in students of 3rd year part 2 MBBS.

The resilience scores of males and females were also compared in the present study. However, the difference was not statistically significant. This is in accordance with studies done by Skehill 2001.[56]

Also in this study, difference in relation with colleagues and its relation with resilience score was found statistically significant. Those students whose relation was very well with colleagues were found to have more resilience. In many of the stressful events of the curriculum, the colleagues serve more helpful than the family members. Also, good relation with colleagues gives a social support in many instances. This may be the reason for students with good relations with colleagues being more resilient as compared to others. In one of his studies outside of the medical school context, Southwick *et al*. in 2005[28] have also identified additional resilience factor such as religious faith, social support, and optimism which help to mitigate the effects of stressful events on well-being. In college life, the colleagues form a major social support. The Resilience being more in students with good relations with colleagues proves that the social support is a positive factor in the development of resilience. However, Findings by Lee and Graham in 2001[57] revealed that many medical students felt guilty for spending time on social activities and personal well-being even though they recognized the importance of doing so. Thus, medical schools should take an initiative to build up social support among students by arranging programs on stress management, healthy relationships and telling their importance in order to increase the interest of students in social activities and increase their resilience.

Quality of life

The results showed that the QoL was best in interns. However, the students of 2nd and 3rd year part 2 showed the least scores. This is discussed previously also that the students of 2nd year face a period of transition while there is a high burden of studies in the 3rd year part 2. High stress affects the psychological well-being of an individual and decreases the QoL.

On subjecting to proper statistical test, satisfaction with accommodation and its relation to QoL was

found significant. The students who were satisfied with accommodation showed higher scores on QoL. As environmental factors are one of the factors determining QoL, this significant statistical difference can be considered as normal and not any exception.

Analysis also showed that Students with problems at home showed a poor QoL as compared to those with no problems at home. Problems affect the psychological health of an individual and thus lead to poor QoL. Thus, there exists a relation between both.

On comparing the exercise in hours/week, the overall difference was found to be statistically significant. Exercise being a determinant of the physical domain of QoL, it affects the overall QoL of an individual. However in this study, it was found that 38% students exercise for <1 h in a week, and only 22.8% students exercise more than 5 h a week. Findings by Lee and Graham revealed that many medical students felt guilty for spending time on social activities and personal well-being even though they recognized the importance of doing so.[57] This indicates a need for change in social norms of the medical curriculum.

Correlations

Coping and resilience

Correlations were determined between the different coping ways and resilience.

A positive correlation of expressive action with resilience at the 0.01 level (2-tailed) was found in this study. It was also found that problem-solving mechanism of coping bears a significant positive correlation with resilience. It was observed that the coping strategies were not problem-oriented in students of 3rd year part 2 MBBS and the scores of resilience were also low in those students. Thus, it found that the problem-based mechanisms of coping are positively correlated with resilience while the emotion-based mechanisms of coping showed a negative correlation with resilience. Some of the studies also proved that resilient individuals exhibit lower levels of denial, avoidant coping behavior, and behavioral disengagement.[58,59] Southwick *et al*.[28] also agreed that resilience has been linked to being able to perceive stressful events in less threatening ways, promoting adaptive coping strategies.[28] Resilient individuals have also been described as possessing problem-solving skills by Aroian 1997.[32] Thus, the positive correlation of problem-oriented mechanisms of coping with resilience found in this study is in accordance with literature and research of the past.

Coping and quality of life

On correlating, it was found there was no significant correlation between escape avoidance and other parameters except for a negative correlation with Physical domain D1 at 0.05 level and a negative correlation of fatalism with resilience, physical domain, environmental domain and total QoL. It was also found that problem-solving mechanism of coping bears a positive correlation with all domains of QoL. There was a negative correlation of passivity with all domains of QoL.

Thus, it found that the Problem-based mechanisms of coping are positively correlated with resilience and QoL while the emotion-based mechanisms of coping showed a negative or statistically nonsignificant correlation with QoL.

Cheng and Cheung 2005[19] have proved previously that a higher level of coping skill is associated with higher level of positive adjustment. Coping flexibility has also been found to be associated with decreases in anxiety symptom severity and increases in QoL when followed for a 2-month interval.[21] Coping flexibility is associated with a decreased likelihood of experiencing increases in depressive symptoms following the occurrence of stressful life events. Resilient individuals have also been described by Aroian[30] as possessing problem-solving skills. Thus, the positive correlation of problem-oriented mechanisms of coping with QoL found in this study is in accordance with literature and research of the past. Talking to friends followed by avoidance behavior such as going to sleep/diverting attention was a coping skill that was found in medical students in a study in India.[60]

Resilience and quality of life

All the domains of QoL showed a positive correlation with resilience score at 0.01 level. This indicates that resilience in individuals is a positive factor for good QoL. Studies have described Resilient individuals as possessing an internal locus of control,[32] meaningfulness,[33] ego strength,[34] self-efficacy,[30] confidence,[35] perseverance[36] problem-solving skills,[33] and flexibility.[37] Such outcomes can be interpreted as being indicative of greater levels of mental health and a good QoL. Thus, building resilience can be considered as one of the ways in improving QoL of individuals.

Limitation of this study is the inability to assess causal factors, due to the study's cross-sectional design. From the above study, we are unable to understand whether coping leads to resilience, or whether more resilient youth are more likely to use adaptive coping strategies. Also, the study was limited to only 250 students of a single medical college. Thus, the results may also get affected by the academic environment of that particular college. Future multicentric longitudinal studies are needed to explore these relationships.

Conclusion

The study performed on the medical students revealed to us the different coping ways, resilience and QoL in students in the different years in the MBBS curriculum.

Problem-oriented mechanisms of coping, resilience, and QoL were higher in students doing internship. Thus, they have a proper approach of handling stress as compared to

students of other years which developed over period of medical education. The students of 3rd year part 2 were less resilient and used improper ways of coping. Their QoL was also on lower side. It was observed that there is a good shift of ways of handling stress toward positive side with an increase in the academic year except for some instability in students of 3rd year Part 2.

Expressive action strategy of coping was more in males as compared to females. Problem-oriented mechanisms of coping were correlated with resilience and QoL while the emotion-based mechanisms of coping showed no correlation with resilience and QoL. High resilience was also found as a positive factor for good QoL.

The above observations gives us the idea about the level of stress that each year in MBBS a student is exposed to and gives indication for the need of special measures that can be employed in the different years to facilitate adjustment in the highly demanding course. One can understand from the study that interventions should begin in the 1st year in medical students itself as a decline was observed in the 2nd and 3rd year part 2. Interventions that offer support like a mentor or stress management programs/workshops focusing on building resilience through coping be introduced. It can further pave the way for changes in the curriculum in MBBS with introduction of certain measures to handle stress.

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Conflicts of interest

There are no conflicts of interest.

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