

The Association Between Parental Socioeconomic Status (SES) and Medical Students' Personal and Professional Development

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Abstract

Introduction: In order to commit to their mission and placement requirements, medical education policy-makers are required to understand the background and character of students in order to admit, cultivate and support them efficiently and effectively. **Materials and Methods:** This study sample consisted of 408 homogeneous medical students with the same level of education, occupation, school and societal environment. They differed mainly in their family background. Therefore, this study used part of a multidimensional "student portfolio system" database to assess the correlation between family status (indexed by parental education and occupation) and medical students' mental health status and characters. The controls were a group of 181 non-medical students in another university. **Results:** The parents of the medical students were from a higher socioeconomic status (SES) than the parents of those in the control group. This showed the heritability of genetic and environment conditions as well as the socioeconomic forces at play in medical education. Students' personal and professional development were associated with their parents' SES. The mother's SES was associated with the student's self-reported stress, mental disturbances, attitude towards life, personality, health, discipline, internationalisation and professionalism. The fathers' SES did not show a statistically significant association with the above stress, physical and mental health factors, but showed an association with some of the personality factors. The greater the educational difference between both parents, the more stress, hopelessness and pessimism the student manifested. **Conclusions:** Medical educators need to be aware that socioeconomic factors have meaningful patterns of association with students' mental and physical health, and their characters relating to personal and professional development. Low maternal SES negatively influences medical students' personal and professional development, suggesting that medical education policy-makers need to initiate support mechanisms for those with latent vulnerability.

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Introduction

In order to commit to their mission and placement requirement efficiently and effectively, policy-makers need to decide which types of students their training units should recruit, what type of curriculum they should design and what kinds of support mechanisms they should implement.

Unlike students entering medical school in the US and Canada, many Asian medical schools take in students immediately after high school. However, even though much of the developmental research has been conducted in middle and high schools, very few have used the adolescent

or young-adult developmental theories on medical students.¹ Meanwhile, few attempts have been made to describe the socioeconomic status profile of medical students.²

There are 2 main reasons why this type of research has practical significance for medical education. First, there is a need for up-to-date data on medical students for planning purposes, in particular for schools with a mission to place graduates to serve in rural or remote areas. For example, an upward socioeconomic status (SES) trainee cohort will have an impact on curricula, continuing and postgraduate education, specialty selection, professional retention and

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practice location. Improved knowledge of these characteristics will provide a base for guiding planners in the design of medical education programmes, manage the future workforce and interact with the community.² Second, limited resources require us to prioritise our prevention and intervention to focus on the most vulnerable. This report considers Erikson's young-adult development theories,¹ social causation theories³ and the bio-psycho-social model as they relate to medical education.

Factors Important to Medical Students' Personal and Professional Development

Medical Student Stress

In the UK, the General Medical Council (GMC) recommends that medical schools have in place mechanisms to identify symptoms of stress that might be early signs of mental illness. Medical schools in the US and Canada tackle the problem at an earlier stage, through prevention in the form of health promotion programmes.⁴

Studies have suggested that medical students experience a high incidence of personal distress with potential adverse consequences on their academic performance, competency, professionalism and health.⁵ Stress is the antecedent of depression, and the worst outcome of depression is suicide.⁴ Student distress has also been reported to be associated with cynicism, unwillingness to care for the chronically ill and decreased empathy.⁵ Despite the strikingly high prevalence of distress, little is known about how demographic variables, personality characteristics, and stressful life events relate to medical student distress.⁵ Most studies have attributed stress or burnout to the rigors of training for and practising medicine.⁶ One study found that suicide ranked higher as a cause of death in medical students than in similarly aged Americans, indicating that both personal and curricular factors should be addressed.⁷

Social Causation Theories in the Microenvironment

SES (indexed by education, occupation and income) serves as a useful illustration of the complexities associated with biological and social risk and protective factors in an aetiological chain extending throughout the life course, encompassing both social and health problems.³ The fact that individuals in lower social classes have higher rates of mental disorders is one of the most consistent and well-accepted findings in the field of psychiatric epidemiology.^{3,8} Numerous studies have shown the robust relationship between low parental SES and increased risk for offspring depression,⁹ illegal drug use,¹⁰ negative psychopathology,¹¹ as well as physical injuries and accidents.¹² Since the 1950s, experts in the field^{13,14} have pointed out the association between maternal SES and reproductive casualties (birth complications and perinatal risks) that may lead to subtle cognitive impairment and later

developmental problems. Other researchers have shown the association between low maternal SES and a high incidence of childhood injuries and diseases.^{15,16}

Student Achievements and Aspirations

Parents' SES has a direct influence on their children's eventual occupational attainment and has been found to be the most powerful and consistent predictor of achievement and career aspirations.¹⁷ Many current findings support previous research which showed that it is more difficult for parents from lower SES backgrounds to positively influence their children's education.¹⁷ Numerous studies with diverse samples and various methodologies have converged on the result of IQ and substantial genetic components to general cognitive abilities.^{18,19} Several studies on adolescents¹⁷ have shown that the academic involvement of parents with lower education levels increases aspirations without necessarily improving the prerequisites of reaching the educational and occupational aspirations. Clearly, students with high aspirations and low capabilities would worsen their conditions of stress.

SES is not an individual characteristic but rather represents exposure to a set of social circumstances. The educational and occupational levels of parents may induce vulnerabilities by adversely influencing developmental processes during childhood or adolescence.⁹ Parental education is the proxy of the physical and mental environment that a child has inherited and experienced. Kohn²⁰ suggests that children from a lower social class are brought up in an atmosphere that encourages a "conformist orientation" without the flexibility necessary to deal with stressful situations. Other impacts of low SES suggested by previous researchers include lower self-esteem, blocked aspirations, status frustrations, impaired efficacy, fatalism and lower mastery and personal control.³

Parental SES and School-parent Collaboration

There has been a push for greater parental academic involvement, greater collaboration between families and schools and an assumption that common goals for students' achievement are most effectively met through collaboration, based on ecological models that emphasise connections among individuals and organisations. Moderation analyses also indicate that adolescents from lower-educated families are more vulnerable to risk factors but also derive more benefits from protective factors.¹¹ However, parents' ability to be true collaborators with schools often varies across SES backgrounds: Parents from higher SES background are more likely to see themselves as collaborators with their children's teachers while parents from low SES background often have various barriers to participating in their children's schooling.¹⁷

Materials and Methods

The basic approach to helping students enhance their cognitive, personal and professional development while coping with internal or external environmental stressors would be to identify and systematically provide supportive elements within medical education. Recognising the fact that each student has different characteristics and needs, the National Yang-Ming University, Faculty of Medicine created a multidimensional and multifunctional “student portfolio system” that integrates dynamic, timely and continuous exploration as well as modification of students’ learning processes, mental status and environmental impact. The first step was to locate and validate students’ “red flag”: factors that contribute to students’ stress, mental disturbances and status attainment (Fig. 1).

Since 2004, all medical students were surveyed with various questionnaires during the entrance orientation. The survey data consisted of the Chinese Health Questionnaire²¹ (CHQ) [converted from GHQ (General Health Questionnaire²²)], the Taiwanese Depression Questionnaire,²³ sociodemographic information, parental education and occupation, questions about chronic fatigue syndrome, personality, stress, entertainment, school and extracurricular activities and value orientation. In 2004, second and fifth year student data were also collected. The control was a randomly selected group of non-medical students in another private university. The controls had lower levels of academic achievement than our medical students, based on an objective index – the national college entrance exam scores. In the national college entrance exam, our university was ranked as a first-tier university while the control was ranked as a middle-level university. Since 2004, students in a general education elective course at this control university were surveyed with the questionnaires. The control university was a comprehensive university and the sample students majors in a wide range of specialties such as business, law, computer, journalism

and literature. It is fair to say that the control group is representative of average Taiwanese college students and that our medical students form an elite group.

At the time of this study, 408 of our medical students from 4 classes (total number of students in the 4 classes = 489) completed the survey. The completion rate was 83%. Two hundred and fifty-two medical students and 181 controls completed the above survey, as well as a group of questions extracted from the Values in Action Institute (VIA) Strength Survey.²⁴ Students’ self reports were used for “risk factor” analyses. The prevalence of stress, mental disturbances, characteristics such as critical thinking, love of learning, perseverance, self-control, caution, leadership and teamwork were explored.

Results

Despite 2 decades of studies describing the high stress levels of medical students and junior doctors, very few of these studies have compared these groups to others at the same stage of their lives.²⁵ In fact, some recent papers have raised strong doubts that the medical profession has any particularly unusual symptomatology.²⁵ Our study compared medical students with age-matched controls, and found that our medical students manifested lower prevalence of stress than the controls, with statistically significant differences (Table 1). However, the real number of students from both groups who suffer from stress (57% and 37%) and family life (41% and 30%) deserves attention. In particular, almost 4% of the medical students expressed hopeless feelings towards their lives, and more than 5% have attempted suicide.

In comparison with the control group, medical students displayed higher prevalence for critical thinking, perseverance, self-control, prudence and accepting love from others, but had a lower prevalence for love of learning, curiosity of new things, sacrifice for the group, forgiveness, humour and playfulness (Table 2).

The increasing educational attainment of students’ parents per year (Table 3) reflects the upward mobility of SES in Taiwan after World War II (Fig. 2). The correlated education levels of both parents (Pearson Coefficient = 0.71; $P < 0.0001$) showed that individuals’ marital matching was associated with their social environment and time.

There was a correlation between the mother’s educational level and her occupation (Table 4; Pearson Coefficient = -0.379; $P < 0.001$). In exploring the roots of medical students’ stress, our correlation coefficient statistical tests showed that students’ stress from home was associated mainly with their mothers’ educational level (Table 5). Students’ other general mental disturbances (without clearly-identified sources) and characteristics showed a partial statistically significant correlation with their mother’s



Fig. 1. Research question: where is the “Red Flag”.

Table 1. Mental Stress of Taiwan College Students (%)

Stress	Control (n = 181)	Medical students in Yang Ming University (n = 408)			χ^2 value (difference between medical students and control)
		Total	Male (65.6%)	Female (34.4%)	
Always feel stressed	56.7	36.7	34.9	39.6	19.994***
Family stress affects my work (study)	32.2	18.0	18.1	17.8	12.799***
My family life is not ideal to me	41.4	29.6	31.7	27.0	6.395*
Basically, I am not satisfied with my life	20.0	11.3	11.9	10.6	7.551**
I feel my life is hopeless	14.4	3.8	2.7	5.2	20.989***
I even attempted suicide	-	5.4	-	4.0	-

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

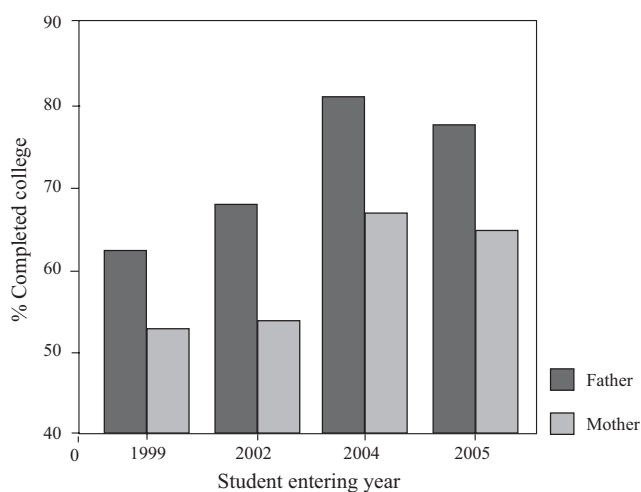


Fig. 2. Percentage of students whose parents completed college by year of entry.

educational level and occupation. The sample sizes of some of the answers (e.g., suicide attempt) were small and were not statistically significant. However, a preliminary comparison of the percentage distribution indeed showed the obvious differences of students' stress and characteristics by mothers' SES (Tables 6a and 6b). We felt that this fact is worthy of attention, because in cultivating such a small homogeneous elite group, we hope to refine on whatever we can by not missing any subtle observations. The data showed that a higher proportion of students with higher capabilities of critical thinking, curiosity, love of learning, industry, diligence, self-regulation, leadership, forgiveness, mercy, capacity to love and be loved, compassion and humour had mothers with higher educational levels and self-sustaining jobs and income. A higher proportion of students with mothers with low educational levels or with no job or income were pessimistic, hopeless, attempting suicide, not satisfied with their family lives, revengeful, irrational or unable to see the big picture. The correlation coefficient tests showed statistically significant results that

medical students with stay-at-home mothers were less willing to go abroad, appreciated less of the humanities such as visiting museums or art collections and were relatively unhealthy as compared to students with career mothers. Fathers' SES did not show statistically significant associations with the above stress and health factors, but showed an association with some of the personality characteristics. The higher the educational difference between father and mother, the higher the stress level, hopelessness and pessimism manifested.

Discussion

Our analysis has reminded us that it is important to examine aspects of parental, school and broader social contexts as well as the inter-relationships among them if we are to understand the factors that may influence medical students' achievements. This understanding would assist us in selecting students, design the curriculum to cultivate professionalism, locate the vulnerable and place graduates in appropriate specialties and locations. Most of the previous studies on medical students' stress or development have tackled only curriculum and school factors.⁶ Whenever a suicide or negative event occurs, schools or society often get the most blame. The data indicate that socioeconomic factors have meaningful patterns of association with students along the spectrum of mental and physical health, as well as characteristics relating to personal and professional development.

Medical students' parents had higher SES than control students', suggesting the heritability of genetic and environmental factors. On the other hand, attention should also be given to see which social groups are underrepresented or omitted from medical education. This requires not only examination of the economic forces at play in society, but also the impact of how we socially organise medicine as a profession.² Medical doctors have an extremely high status in Taiwan; parents and students exert much effort to get into medical school. However, an individual with high

Table 2. Characteristics of Taiwan College Students (%)

Characteristics	Medical students in Yang Ming University (n = 252)			
	Control (n = 181)	Total	Male (62.7%)	Female (37.3%)
Judgment, Critical Thinking and Open-Mindedness				
When the topic calls for it, I can be a highly rational thinker	31.4	36.1	40.5	27.5
I am always able to look at things and see the big picture	54.2	52.3	55.7	47.8
Curiosity/Love of Learning				
I am always curious about the world	76.9	71.1	66.4	78.3
I get bored easily	32.5	22.7	19.8	26.1
I am thrilled when I learn something new	75.2	68.6	64.7	76.8
Industry, Diligence, and Perseverance				
I do not quit easily, I finish things despite obstacles in the way	21.7	39.1	40.7	37.1
I always do my best	49.6	59.8	59.5	61.4
I often procrastinate	32.2	25.3	27.6	20.0
Self-control and Self-regulation				
I am able to control my emotions	45.0	59.4	61.1	58.6
My diet plans usually ends before the term	50.0	24.5	14.2	42.9
I seldom think clearly before I do things (often rush things through by impulse)	18.2	12.4	13.8	10.0
Caution, Prudence and Discretion				
I always avoid activities that are physically dangerous	55.0	61.5	58.4	65.7
I sometimes make the wrong choice and pick the wrong person as my friend or lover	35.5	17.2	18.6	15.7
Leadership, Teamwork and Loyalty				
I work at my very best when I am a group member	76.7	79.8	78.1	82.9
I am not good at organising group activities	30.0	32.5	33.9	31.4
I would not hesitate to sacrifice myself for the group	20.0	14.6	14.2	15.7
Forgiveness and Mercy				
I let go of my past	34.7	29.9	31.9	22.9
I definitely revenge; I don't let go unless I get my revenge	21.5	11.3	14.7	7.1
Capacity to Love and Be Loved				
There are people in my life who care as much about my feelings and well-being as they do about their own	62.5	68.2	65.5	72.9
I am not good at accepting love from others	24.5	15.5	12.3	21.4
Hope, Optimism and Future-Mindedness				
I always look on the bright side	30.6	30.4	30.2	32.9
Humour and Playfulness				
I seldom make other people laugh	6.6	10.8	12.1	8.6

Table 3. Educational Attainment of Parents of College Students (%)

Father's/Mother's educational attainment	Medical students in Yang Ming University (n = 408)					
	Control (n = 181)	Total	2005 first-year student	2004 first-year student	2004 second-year student	2004 fifth-year student
Below middle/junior high school	24.3/40.7	8.9/11.3	6.4/7.7	4.1/6.6	11.7/14.0	15.3/21.2
High school	45.2/44.1	18.0/26.7	16.0/27.5	14.9/26.4	20.2/32.2	22.4/25.9
Junior college	28.8/14.7	51.3/50.5	52.1/53.8	55.4/59.5	44.7/48.4	51.8/47.1
Above institute	1.7/0.6	21.8/7.1	25.5/11.0	25.6/7.4	23.4/5.4	10.6/5.9

Table 4. Mother's Occupation by Her Educational Attainment (%)

Mother's educational attainment	Medical students in Yang Ming University (n = 408)	
	Career woman (61.2%)	Housewife (38.8%)
Below middle/junior high school	5.2	21.1
High school	19.5	42.1
Junior college	65.2	33.8
Above institute	10.0	3.0

Pearson Correlation Coefficient = -0.379, $P < 0.001$

aspirations and low prerequisites, along with a mother with a low educational level, may very likely face negative consequences.¹⁷ Our findings of the robust and consistent association of maternal SES with the offspring's outcome are consistent with previous studies. Medical students manifested high discipline and self-control but not necessarily natural interest in learning; this may also increase the risk of developing stress and compromise.

There seem to be enormous problems and compromises in families where there is a big difference between the SES of both parents. Most students have parents with similar educational levels. However, in the rare instances where this is not so, students tend to display pessimism towards their future, hopelessness and stress. These students as well as female medical students with stay-at-home mothers

appear to be the most vulnerable. They reported having a higher prevalence of a sense of meaninglessness, hopeless and attempts suicide. This gender-specific results could be due to the struggle of having a maternal housewife model coupled with the high demand for intellectual capacity, discipline, self-control and professionalism in their own careers.¹⁷

How Should Medical Schools Respond to These Findings?

First, medical educators need to be aware of the prevalence of personal and professional distress of students. Second, there is a need to develop support systems to help students address these challenges, including confidential resources.⁶ Third, there should be programmes to educate students about stress management and promote self-awareness and self-education.⁷ Fourth, medical schools should foster a relationship with students' families. Among middle- and high-school students, discussions among parents, teachers, and school administrators with adolescents about schooling and future plans have shown the strongest relationship with academic outcomes.¹⁷ After the children enter college, communication between the family and the school declines. However, schools should be sensitive when collaborating with low SES parents, as students may feel that their image is damaged by their "insufficient" mother, embarrassed or even ashamed to have their "inappropriate" parents being

Table 5. The Association between Parental Education and Medical Students' Stress from Home

Stress		Family stress affects my work (study)			My family life is not ideal to me		
		Total	Male	Female	Total	Male	Female
Father's education	Correlation coefficient	-0.95	-0.133	-0.023	-0.100	-0.158*	0.026
	Sig.(2-tailed)	0.106	0.069	0.822	0.090	0.031	0.798
Mother's education	Correlation coefficient	-0.135*	-0.197**	-0.022	-0.173**	-0.220**	-0.079
	Sig.(2-tailed)	0.022	0.007	0.825	0.003	0.003	0.433

* $P < 0.05$; ** $P < 0.01$

Table 6a. Taiwan College Students' Stress by Mothers' Occupation (%)

Stress	Medical students in Yang Ming University (n = 408)							
	Control		Total		Male		Female	
	Career woman (54.2%)	Housewife (45.8%)	Career woman (61.6%)	Housewife (38.4%)	Career woman (63.4%)	Housewife (36.6%)	Career woman (59.5%)	Housewife (40.5%)
Always feel stressed	61.5	47.0	34.9	39.5	35.0	35.7	34.7	44.7
Family stress affects my work (study)	23.1	37.9	17.1	18.1	14.2	20.3	23.1	14.7
My family life is not ideal to me	34.2	38.5	27.4	32.7	28.6	36.5	25.0	27.3
Basically, I am not satisfied with my life	17.9	18.2	11.3	11.4	12.5	9.6	8.7	15.2
I feel my life is hopeless	15.4	10.6	3.3	2.9	2.7	-	4.3	8.5
I even have attempted suicide	-	-	0.7	2.4	4.2	1.9	2.5	7.2

Table 6b. Medical Students' Characteristics by Mother's Occupation (%)

	Medical students in Yang Ming University (n = 252)					
	Total		Male		Female	
	Career woman (65.8%)	Housewife (34.2%)	Career woman (71.3%)	Housewife (28.7%)	Career woman (54.5%)	Housewife (45.5%)
Judgment, Critical Thinking and Open-Mindedness						
When the topic calls for it, I can be a highly rational thinker	42.3	29.6	45.8	34.5	33.3	24.0
I am always able to look at things and see the big picture	58.7	35.2	58.3	44.8	60.0	24.0
Curiosity/Love of Learning						
I am always curious about the world	71.2	66.7	70.8	58.6	73.3	76.0
I get bored easily	25.0	14.8	22.2	13.8	33.3	16.0
I am thrilled when I learn something new	74.0	61.1	70.8	58.6	83.3	64.0
Industry, Diligence and Perseverance						
I do not quit easily; I finish things despite obstacles in the way	43.1	37.0	42.9	41.4	43.3	32.0
I always do my best	64.1	57.4	61.6	58.6	70.0	56.0
I often procrastinate	25.2	25.9	30.6	20.7	13.3	32.0
Self-control and Self-regulation						
I am able to control my emotions	63.7	62.3	60.0	64.3	70.0	60.0
My diet plans usually end before the term	20.6	28.3	15.7	10.7	33.3	48.0
I seldom think clearly before I do things (often rush things through by impulse)	11.7	16.7	13.9	17.2	3.3	16.0
Caution, Prudence and Discretion						
I always avoid activities that are physically dangerous	57.8	71.7	54.3	78.6	63.3	64.0
I sometimes make the wrong choice and pick the wrong person as my friend or lover	14.7	18.9	15.7	21.4	13.3	16.0
Leadership, Teamwork and Loyalty						
I work at my very best when I am a group member	84.3	77.8	77.1	82.8	100.0	72.0
I am not good at organising group activities	30.7	37.7	31.9	39.3	26.7	36.0
I would not hesitate to sacrifice myself for the group	11.8	13.2	14.3	7.1	6.7	20.0
Forgiveness and Mercy						
I let go of my past	34.0	18.5	36.1	24.1	26.7	12.0
I definitely revenge; I don't let go unless I get my revenge	8.7	16.7	11.1	20.7	3.3	20.0
Capacity to Love and Be Loved						
There are people in my life who care as much about my feelings and well-being as they do about their own	74.3	59.3	71.0	55.2	80.0	64.0
I am not good at accepting love from others	10.8	22.2	8.6	20.7	16.7	24.0
Hope, Optimism and Future-Mindedness						
I always look on the bright side	33.0	33.3	30.6	34.5	40.0	32.0
Humour and Playfulness						
I seldom make other people laugh	6.8	18.5	5.6	20.7	6.7	16.0

seen by teachers or peers.

Teaching students stress-management and self-awareness, adaptive coping strategies such as acceptance, planning, positive reinterpretation and self-distraction can reduce physiological and psychological morbidity.⁶ In summary, it is critical for contemporary medical education institutions to develop a framework for the theory and practice of medical students' development that results in the attainment of professional, sociological, and psychological competencies.

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