CHAPTER IV

RESULT

This descriptive cross-sectional study was conducted in University of Medicine and Pharmacy at HoChiMinh city, VietNam. The study determined the prevalence of depression, sources of stress and factors related to depression among 351 first year Medical students. Total study population was 382 subjects but at last total sample was 351 students with 91.0% of respond rate. The results are presented in four parts as follows:

- General characteristics including general and potential personal consequence factors

- Prevalence of depression among the first year Medical students

- Sources of stress among the first year Medical students.

- Relationship between general characteristics, potential personal consequence factors, sources of stress and depression.

4.1 Description of General characteristics

Gender

There were 351 first year Medical students that consisted of male more than female (58.1% vs 41.9%).

Age

The students' age ranged from 18 to 25 years, with a mean age of 19.37 and standard deviation of 0.845.

Ethnicity

The main ethnicity group was Vietnamese accounting for 85.2%; the Khmer group was 5.7%; others groups were Chinese, Cham and Cambodian with 8.1%.

Living status

Living status included 4 variables as hometown, living location, type of accommodation, and whom student lived with.

Hometown and living location

Most of the students' hometown was not from HoChiMinh city (77.8%). They were mainly located in inner-city with 90.9%, only 9.1% of them stayed in sub-urban area.

Type of accommodation and whom student lived with

They mainly lived in rented-room or house with 35%, in dormitory with 32.5%; 23.4% of them lived in their own home and some of them lived in their relative's house by 6%. They lived with their friend (46.4%), their relative (21.1%), their family (20.8 %) and stay alone (11.7%).

Table 3: Description of general characteristics

Variables		Frequency	Percentage
Gender (n=351)			
	Male	204	58.1
	Female	147	41.9
Age (n=351)			
	Mean = 19.37	Range: 18-25	
	SD = 0.845		
Ethnicity (n=351)			
	Vietnamese	299	85.2
	Chinese	10	2.8
	Khmer	20	5.7
	Cham	22	6.3
Hometown (n=351)			
	Non-HCM city	273	77.8
	HCM city	78	22.2
Living Location (n=351)			
	Inner city	319	90.9
	Sub-urban	32	9.1
Type of accommodation (n=351)			
	Dormitory	114	32.5
	Rented room/house	123	35.0
	One's home	82	23.4
	Relative's home	21	6.0
	Others	11	3.1
Whom students live with (n=351)			
	Alone	41	11.7
	Friend	163	46.4
	Relative	74	21.1
	Family	73	20.8

Religion

About religion, more than half (66.4%) of the students said they had no religion which actually it was Ancestor worship (a traditional belief may not be strictly considered as a religion) or they were Buddhist but they did not practice strictly as a follower. Buddhist was proclaimed as their religion by 21.1%, Christian was rated with 10.8% and the rest was answered with 1.7% of others as Cao Dai.

Religion practice

Religion practice was defined as participation in services and activities of the religion, particularly going to church or pagoda and fasting. Among students that have religion, those who sometime participate ($\geq$ twice/year & < once/4 week) was 37.3%, 33.1% of them always do their religious activities Always ($\geq$ once/week), rarely practice were 16.9%; while only 12.7% of them followed often ($\geq$ one/4 week & < one/week).

Table 4: The student's religion and their religious practice

	Frequency	Percentage
Religion (n=351)		
Buddhist	74	21.1
Christian	38	10.8
Others	6	1.7
Non	233	66.4
Religious practice (n=118)		
Rarely	20	16.9
Sometime ($\geq$ twice/year & < once/4 week)	44	37.3
Often ($\geq$ one/4 week & < one/week)	15	12.7
Always ($\geq$ once/week)	39	33.1

Finance support

Most of the students were fully supported by their family with 92.9% (from parents or sister/bother, and their relatives), some of them (5.1%) were partially supported by their parents and the rest was earned by themselves, the others (2%) loaned or were sponsored by government.

Part-time job

Among the students, some of them had part-time job with 10.8%, the remaining (89.2%) had no part-time job.

Perception of financial status

38% of students felt their finance status was nearly sufficient, 33.9% felt that it was sufficient and 4.3% answered that it was not enough for tuition. 12% of the students said that their finance was comfortable, 11.7% reported that finance was not enough for their living cost, 4.3% was responded not enough for tuition.

Table 5: Financial status

Variables	Frequency	Percentage
Financial support (n=351)		
Fully support	326	92.9
Partialy support	18	5.1
Others	7	2.0
Part-time job (n=351)		
No	313	89.2
Yes	38	10.8
Perception of financial status (n=351)		
Not enough for tuition	15	4.3
Not enough for living	41	11.7
Nearly sufficient	134	38.2
Sufficient	119	33.9
Comfortable	42	12.0

Coping with problems

When facing the problems, 54.1 % of students talked with their friend, 24.2% talked to parents, 19.1% solved by themselves, 13.1 % of them prayed, and others chose traveling, solving by themselves with 8%.

Table 6: Coping with problems

Coping with problems *	Frequency	Percentage
1. Talk to friend (n=351)	190	54.1
2. Talk to parents (n=351)	85	24.2
3. Solve by oneself (n=351)	67	19.1
4. Praying (n=351)	46	13.1
5. Others (n=351)	28	8.0
6. Smoke/drink (n=351)	5	1.4

* Multiple choice question. More than one choice can be chosen

4.2 Potential personal consequence factors

Potential personal consequence factors concluded quality of relationship with friends and with parents, parents' marital status, leisure, and exercise activities variables.

Satisfaction with friendship

The table 7 presented 18.5% of students did not have close friend and only 20% had lover. Regarding satisfaction of relationship, 60.7% satisfied, 28.2% very satisfied, 10.3% of student did not satisfy, only nearly 1% did not satisfy with their friend at all.

Table 7: Quality of friendship

Quality of friendship	Frequency	Percentage
Having Close friend (n=351)		
Yes	286	81.5
Having lover (n=351)		
Yes	71	20.2
Satisfaction with friendship (n=351)		
Very satisfy	99	28.2
Satisfy	213	60.7
Not satisfy	36	10.3
Not satisfy at all	3	0.9

Parents' marital status

Almost parents of students lived together (92.9%), remaining percentages with 3.1% of students lost their father or mother, 2.6% their parent divorced and 1.4% for separated parent.

Quality of relationship with parents

About the satisfaction of relationship with parents, the percentage of students very satisfied more than percentage of satisfied (63% vs 32.5%), only 4.3% of them did not satisfy and 0.3% for not satisfy at all.

Table 8: Quality of relationship with parents

	Frequency	Percentage
Parents' marital status (n=351)		
Together	326	92.9
Separated	5	1.4
Divorce	9	2.6
Loss	11	3.1
Satisfaction of relationship with parents (n=351)		
Very satisfy	221	63.0
Satisfy	114	32.5
Not satisfy	15	4.3
Not satisfy at all	1	.3

Leisure activities

The percentage of students who chose listening to music of reading book, watching television and playing games for leisure in free time was 74.4%. Following that was 29.6% of students who went out with friends and only 14.5% of play sports; Besides, 3.4% student chose sleeping and 8.8% for others such as nothing, some complained that they did not have free time and others choices as went back their home town, did homework.

Exercise practice

The highest percentage did it sometime ($\geq$ 1 & $\leq$ 3 times/month) by 28.2%; 26.5% of them did exercise seldom (< 1 time/month), 12.3% of students answered never doing. Doing exercise often (> 3 & < 12 times/month) was responded by 21.4% and only 11.7% for practice always ($\geq$ 12 times/moth).

Table 9: Leisure activities and exercise practice

	Frequency	Percentage
Leisure activities*		
1. Listen to music/read book/TV/game (n=351)	261	74.4
2. Go out with friend (n=351)	104	29.6
3. Sport (n=351)	51	14.5
4. Others (n=351)	31	8.8
5. Sleeping (n=351)	12	3.4
Exercise activities (n=351)		
Never	43	12.3
Seldom (< 1 time/month)	93	26.5
Sometime ($\geq$ 1 & $\leq$ 3 times/month)	99	28.2
Often (> 3 & < 12 times/month)	75	21.4
Always ($\geq$ 12 times/moth)	41	11.7

* Multiple choice question. More than one choice can be chosen

4.3 Student stress factors

Generally, students responded whole 40 items student stress factors that focused on four main sources, including interpersonal, intrapersonal, and academic sources. Students were asked about their experiences those events during this academic year (from September, 2007 until February, 2008).

Interpersonal factors

In interpersonal sources, among six factors, the highest percentage (62.7%) of students was stressed of working with un-acquainted people, followed by 51.3% of change in social activities. The remaining with finding new friends experience was responded 36.8%, 26.5% of trouble with parent, and 22.8% for conflicted with roommate.

Intrapersonal s factors

In sixteen intrapersonal sources, most of the students (91.7%) had started college and they had to deal with new responsibilities (88.6%); moreover, they changed their sleeping, eating habits (76.1% & 70.7%) and declined their health obviously (60.1%). In additional, many students (64.1%) found difficulty in speaking in public and nearly half of the students (47.9%) admitted to violate the minor law such as the laws of safe traffic, then a little lower percentage of students (44.4) faced financial difficulties.

Academic factors

Being a student, increased class workload and lower grader than anticipated were 2 problems that most of Medical students experienced with 88% and 82.3%; they also reported that missed too many classes by 55% and anticipated of graduation by 47.3% in eight academic sources.

Environmental factors

According to environmental sources, approximately 72% of students had to change in living environment and placed in unfamiliar situation; they were put on hold for extended period of time (67%) and their vacation or break time were not enough (61.8%); car troubles (56.1%), wait in long line (55%), and computer problems (49.3%).

Table 10: Student stress factors

Student stress factors (n=351)	Frequency	Percentage
Interpersonal factors		
1. Working with unacquainted people	220	62.7
2. Change in social activities	180	51.3
3. Trouble in finding new friend	129	36.8
4. Trouble with parents	93	26.5
5. Roommate's conflict	80	22.8
6. Fight with friend		
(quarrel or cannot get along with friend)	31	8.8
Intrapersonal factors		
1. Started college	322	91.7
2. New responsibilities	311	88.6
3. Change in sleeping habits	267	76.1
4. Change in eating habits	248	70.7
5. Problem in spoke in public	225	64.1
6. Decline in personal health	211	60.1
7. Minor law violation (such as traffic law...)	168	47.9
8. Financial difficulties	156	44.4
9. Outstanding personal achievement (excellent study performance)	72	20.5
10. Holding a job	64	18.2
11. Death of a family member	54	15.4
12. Change in religious beliefs	30	8.5
13. Change in use of alcohol or drugs	30	8.5
14. Death of a friend	18	5.1
15. Severe injury	17	4.8
16. Engagement/Marriage	10	2.8

Table 10: Student stress factors (continued)

Student stress factors (n=351)	Frequency	Percentage
Academic factors		
1. Increased class workload	309	88.0
2. Lower grade than anticipated	289	82.3
3. Missed too many classes	193	55.0
4. Anticipation of graduation (expectation after graduation)	166	47.3
5. Search for graduate school/job (prepare for after graduation)	97	27.6
6. Change of Major	44	12.5
7. Transferred schools	35	10.0
8. Serious argument with instructor	29	8.3
Environmental factors		
1. Change in living environment	254	72.4
2. Placed in unfamiliar situation	251	71.5
3. Put on hold for extended period of time (waiting for something for uncertainty time)	235	67.0
4. Vacations/breaks (no vacations/break or it was too short or not enough)	217	61.8
5. Car trouble	197	56.1
6. Waited in long line	193	55.0
7. Computer problems	173	49.3
8. Messy living conditions	116	33.0
9. Quit job	24	6.8
10. Divorce between parents	6	1.7

4.4 Prevalence of depression

Using CES-D question for asking the feeling or behaviors that the responder had during last week, twenty scale questions scored from 0 to 3 as 0 for never or rarely, 1 for sometime, 2 for occasionally, 3 for mostly level were summed up of 20 questions. The minimum score and maximum was 4 and 50, the range was 4-50. The mean and standard deviation was 19.6 and 8.5.

According to previous study done by Ratana that using CES-D tool and cut-off point of 22, with the screening approach, the found out that 39.6% of the first year Medical students were having depressive symptom (more than 22 scores), 60.4% of them had no depressive symptom (less than 22 scores).

Table 11: Prevalence of depression among the first year Medical students

Prevalence of depression (n=351)	Frequency	Percentage
No Depressive symptom	212	60.4
Depressive symptom	139	39.6
Mean = 19.6, SD = 8.5, Range: 4 – 50		

4.5 Relationship between depression and related factors

In the analytical part, firstly, depression variable was used as a binary variable with two values, have depressive symptom and have no depressive symptom. The relationship between general characteristics, potential personal consequence factors, source of stress and depression were determined by Chi-square test, Spearman correlation and the level of significance for relationship between these variables was

set at P-value = 0.05. Secondly, Logistic regression was used in multivariate analysis with odds ratio, coefficient and p-value.

Bivariate analysis

4.5.1 Relationship between depression and general characteristics

Age

Using non-parametric spearman correlation to find relationship between ages as a continuous variable with non-normality distribution and depression as continuous variable, the relationship was not significant difference at P-value = 0.081 (>0.05).

Gender

There was no significantly difference between percentage of male and female who get depression with P-value = .201

Ethnicity

After combination of Khmer, Cham, Chinese and others become one group because expected values were less than 5%, there were highly significantly differences between depression and ethnicity (P-value = 0.01). 55.8% of other ethnic students had depression that compared with 36.8% percentage of Vietnamese students.

Hometown

Students who had hometown in other provinces and in HCM city were not significant difference in prevalence of depression with P-value = .307

Living location

There was no significantly difference between percentage of students that live in inner city and sub-urban get depression with P-value = 0.377

Type of accommodation

The differences between types of accommodation and depression was highly significantly (P-value = 0.014). Students lived in dormitory were likely get depression with highest percentage (51.8%) comparing with other places.

Religion

There was no significantly difference between depression and religion variable with P-Value = 0.147

Whom students live with

Students lived with friends and alone get depression higher (46.6%) than the other students who lived with family or their relative at P-value = 0.015.

Table 12: The relationship between depression and general characteristics

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Gender (n=351)				
Male	129 (63.2)	75 (36.8)	1.638(1)	.201
Female	83 (56.5)	64 (43.5)		
Ethnicity (n=351)				
Vietnamese	189 (63.2)	110 (36.8)	6.671(1)	.010
Others	23 (44.2)	29 (55.8)		
Hometown (n=351)				
HoChiMinh	51 (65.4)	27 (34.6)	1.042(1)	.307
Non-HoChiMinh	161 (59.0)	112 (41.0)		
Living location (n=351)				
Inner city	195 (61.1)	124 (38.9)	0.779(1)	.377
Sub-urban	17 (53.1)	15 (46.9)		
Type of accommodation (n=351)				
Dormitory	55 (48.2)	59 (51.8)	10.646(3)	.014
Rented room/house	82 (66.7)	41 (33.3)		
One's own	55 (67.1)	27 (32.9)		
Relative's + Others	20 (62.5)	12 (37.5)		
Religion (n=351)				
Buddhist	38 (51.4)	36 (48.6)		
Christian + others	30 (68.2)	14 (31.8)	3.839(2)	.147
Non-religion	144 (61.8)	89 (38.2)		
Whom students lived with (n=351)				
Alone	22 (53.7)	19 (46.3)		
Friends	87 (53.4)	76 (46.6)	10.413(3)	.015
Relative	54 (73.0)	20 (27.0)		
Family	49 (67.1)	24 (32.9)		

Religious practice

There was not significantly difference between depression and the level of religious practice of students at P-value = 0.615

Table 13: The relationship between depression and religion practice

Religion practice (n=351)	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Rarely	12 (60.0)	8 (40.0)		
Sometime	22 (50.0)	22 (50.0)	1.799(3)	.615
Often	9 (60.0)	6 (40.0)		
Always	25 (64.1)	14 (35.9)		

Perception of financial status

As shown in table 14, the difference between depression and perception of financial status was significant with 0.044 of P-value. The students who had not enough finance for tuition fee get depressive symptom at highest percentage at 73.3% comparing with lower depression of other higher financial status.

Table 14: The relationship between depression and perception of financial status

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Not enough for tuition	4 (26.7)	11 (73.3)		
Not enough for living cost	21 (51.2)	20 (48.8)	9.805(4)	.044
Nearly enough	86 (64.2)	48 (35.8)		
Sufficient	74 (62.2)	45 (37.8)		
Comfortable	27 (64.3)	15 (35.7)		

Coping with problem

There were many ways that students chose to cope with their problems like talking to friends, talking to parent, praying, smoking/drinking, solving by themselves, etc. Among those ways, there were no differences between depression and each of above way significantly (P-value>.05). In multiple choices, there were no significant differences in combination many choices and depression.

Table 15: The relationship between depression and coping with problems

| Coping with problem* | Depression (n=351) | | χ^2 (df) | P-value |
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Talk to friends	121 (63.7)	69 (36.3)	1.869(1)	.172
Talk to parents	58 (68.2)	27 (31.8)	2.880(1)	.090
Pray	25 (54.3)	21 (45.7)	.810(1)	.368
Smoke/drink	4 (80.0)	1 (20.0)	**	.652
Solve by yourself	43 (64.2)	24 (35.8)	.495(1)	.482
Others	14 (50.0)	14 (50.0)	1.376(1)	.241

* Multiple choices question. More than one choice can be chosen.
** Fisher's exact test

4.5.2 Relationship between depression and potential personal consequence

Potential personal consequence factors were satisfaction of relationship with their friends in general and parents. Satisfaction was a scale variable with 4 values as very satisfy, satisfy, not satisfy and not satisfy at all, but in Chi-square test 2 last values (not satisfy and not satisfy at all) was combined to become one value that was showed in table 16.

Quality of friendship with friends

There was a highly significantly differences between depression and satisfaction of students with their friend at P-value < .0001. Percentage of students did not satisfy with their friend get depressive symptom with highest percentage (64.1).

Among students who had no close friends and lower, percentage of depressive symptom in not satisfy group (80%) was likely more higher significant than not satisfy group (37.2%) with p-value =0.031.

Quality of relationship with parents

Among students whose parents divorced or separated, 100% of them were not satisfy with their relationship with parents. The difference between depression and satisfaction with their parents was highly significant with P-value = .005, by the highest percentage of students in not satisfy group (75.0) get depressive symptom compared with the others group.

Table 16: The relationship between depression and quality of relationship

	Depression			
	Non Depressive symptoms n (%)	Depressive symptoms n (%)	χ^2 (df)	P-value
Satisfaction with friendship (n=351)				
Very satisfy	73 (73.7)	26 (26.3)		
Satisfy	125 (58.7)	88 (41.3)	17.414(2)	<.001
Not satisfy + not satisfy at all	14 (35.9)	25 (64.1)		
Satisfaction of relationship with parents (n=351)				
Very satisfy	143 (64.7)	78 (35.3)	10.641(2)	.005
Satisfy	65 (57.0)	49 (43.0)		
Not satisfy + not satisfy at all	4 (25.0)	12 (75.0)		

Table 17: The satisfaction with friendship among students who have no close friend and lower

Satisfaction with friend (n=53)	Depression			
	Non Depressive symptoms n (%)	Depressive symptoms n (%)	χ^2 (df)	P-value
Satisfy	27 (62.8)	16(37.2)	*	.031
Not satisfy	2 (20.0)	8 (80.0)		

* Fisher's exact test

Exercise practice

The difference between those who did exercise regularly and those who did not exercise had high significant relationship with depression by P-value = .006. Those who did not exercise had depressive symptom with highest percentage (53.5) comparing with remaining groups.

Table 18: The relationship between depression and exercise practice

| Exercise activity | Depression | | χ^2 (df) | P-value |
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Never	20 (46.5)	23 (53.5)		
Seldom (< 1 time/month)	48 (51.6)	45 (48.4)		
Sometime (≥ 1 & ≤ 3 times/month)	61(61.6)	38 (38.4)	14.31(4)	.006
Often (> 3 & < 12 times/month)	57 (76.0)	18 (24.0)		
Always (≥ 12 times/moth)	26 (63.4)	15 (36.6)		

Leisure activities

Leisure activities including going out with friends, listening to music/reading book/watching TV/playing games, playing sports, sleeping, and others were checked separately the relationship with depression. Within each separate choice, there were no significantly differences in any relationship with P-value > 0.05 (shown in appendix A)

For more than one choice that shown in table 20, students who chose going out with friend and listening to music/read book/TV/game get less depressive symptom than the students who had one leisure activity. This different was significant with P-value = 0.032. Only 25 students chose play sport and listen to music/read book/TV/game, 25 students chose to play sport and go out with friends, the chi-square

test for relationship among those choice and depression showed insignificant

difference with p-value>0.05.

Table 19: The relationship between leisure activities and depression

| Leisure* (n=351) | Depression | | χ^2 (df) | P-value |
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Go out with friend and listen to music/ book/ TV/game				
Yes	43 (72.9)	16 (27.1)	4.620	0.032
No	169 (57.9)	123 (41.2)		

* Multiple choices question. More than choice can be chosen

4.5.3 Relationship between depression and student stress

Firstly, stress was considered as continuous data by sum total score that

students responded their experience during this academic year (since September, 2007

until February, 2008). The range of stress score was from 1 to 29, with mean of 16.42

and SD = 4.72. Then the relationship between depression and stress was analyzed in

Spearman Correlation for non parametric statistics. Generally, stress and depression

had a positive linear relationship highly significant with correlation coefficient r =

0.272 and p-value < 0.001.

Table 20: The relationship between stress and depression

	Coefficient	P-value
Spearman correlation (n=351)		
Stress score and depressive score	.272	< .001

As Students stress survey approach, the student stress source focus on sources of stress so the relationship between depression and 40 student stress sources was characterized specifically in table 21, 22, 23 and 24.

Interpersonal stress sources

In table 21, among 6 factors in interpersonal sources, only relationship between depression and trouble with parent, change in social activities was not significant differences with P-value > 0.05. The 4 remaining sources that consisting finding new friend; working with un-known people, roommate conflict and fight with friend was significant differences.

Finding new friend

There were significant differences between depression and experiences in finding new friend at P-value = 0.025. Percentage of students who had finding new friend experience get depression higher than students who had no that experience with 4 7.3% vs 35.1%.

Working with un-acquainted people

Students who had to work with un-acquainted people had lower depressive symptom at comparing with students who had no experience in work with un-acquainted people with 35.0% and 47.3% respectively at P-value = 0.022.

Roommate conflict

The difference between depression and roommate conflict of among students was significantly at P-value = 0.03. Half of students (50%) who had roommate conflict get depression while only 36.5% of students that had not conflict get depression.

Fight with friend

Nearly 58% of students that fought with friend get depression while 37.8% of students had no fighting had depression. This different was significant at P-value = 0.028.

Table 21: The relationship between depression and interpersonal sources

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Interpersonal sources (n=351)				
1. Finding new friend				
Yes	68 (52.7)	61 (47.3)	5.037 (1)	.025
No	144 (64.9)	78 (35.1)		
2. Working with un-acquainted people				
Yes	143 (65.0)	77 (35.0)	5.217(1)	.022
No	69 (52.7)	62 (47.3)		
3. Roommate's conflict?				
Yes	40 (50.0)	40 (50.0)	4.684(1)	.030
No	172 (63.5)	99 (36.5)		
4. Change in social activities				
Yes	107 (59.4)	73 (40.6)	.141(1)	.708
No	105 (61.4)	66 (38.6)		
5. Fight with friend				
Yes	13 (41.9)	18 (58.1)	4.846(1)	.028
No	199 (62.2)	121 (37.8)		
6. Trouble with parents				
Yes	57 (61.3)	36 (38.7)	.042(1)	.838
No	155 (60.1)	103 (39.9)		

Intrapersonal stress sources

Among 17 intrapersonal sources, there were only 2 sources as minor law violation and decline in personal health had significantly differences.

Minor law violation

There was significant difference between minor law violation and depression in which the percentage of students that violated minor law had higher percentage than those who did not violate by 45.2% vs 34.4% at P-value = 0.039.

Decline in personal health

There was highly significantly difference between depression and decline in personal health by P-value = 0.001. Among students who declined in their health with 46.4% responded depressive symptom, a lower percentage of depression in group did not decline in their health with 29.3%.

Table 22: The relationship between depression and intrapersonal sources

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Intrapersonal Sources				
7. New responsibilities				
Yes	185 (59.5)	126 (40.5)	.952(1)	.329
No	27 (67.5)	13 (32.5)		
8. Started college				
Yes	16 (55.2)	13 (44.8)	.361(1)	.548
No	196 (60.9)	126 (39.1)		

Table 22: (continued) The relationship between depression and intrapersonal sources

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
9. Change in sleeping habits				
Yes	155 (58.1)	112 (41.9)	2.568(1)	.109
No	57 (67.9)	27 (32.1)		
10. Change in eating habits				
Yes	147 (59.3)	101 (40.7)	.447(1)	.504
No	65 (63.1)	38 (36.9)		
11. Outstanding personal achievement (excellent study performance)				
Yes	43 (59.7)	29 (40.3)	.017(1)	.895
No	169 (60.6)	110 (39.4)		
12. Financial difficulties				
Yes	90 (57.7)	66 (42.3)	.860(1)	.354
No	122 (62.6)	73 (37.4)		
13. Spoke in public				
Yes	132 (58.7)	93 (41.3)	.786(1)	.375
No	80 (63.5)	46 (36.5)		
14. Change in religious beliefs				
Yes	16 (53.3)	14 (46.7)	.685(1)	.408
No	196 (61.1)	125 (38.9)		
15. Minor law violation				
Yes	92 (54.8)	76 (45.2)	4.281(1)	.039
No	120 (65.6)	63 (34.4)		
16. Decline in personal health				
Yes	113 (53.6)	98 (46.4)	10.361(1)	.001
No	99 (70.7)	41 (29.3)		

Table 22: (Continued) The relationship between depression and intrapersonal sources

17. Held a job				
Yes	40 (62.5)	24 (37.5)	.144(1)	.704
No	172 (59.9)	115 (40.1)		
18. Change in use of alcohol or drugs				
Yes	15 (50.0)	15 (50.0)	1.483(1)	.223
No	197 (61.4)	124 (38.6)		
19. Engagement/Marriage				
Yes	4 (40.0)	6 (60.0)	*	.203
No	208 (61.0)	133 (39.0)		
20. Death of a family member				
Yes	28 (51.9)	26 (48.1)	1.949(1)	.163
No	184 (62.0)	113 (38.0)		
21. Death of a friend				
Yes	8 (47.1)	9 (52.9)	.004(1)	.949
No	201 (60.4)	132 (39.6)		
22. Severe injury				
Yes	11 (61.1)	7 (38.9)	1.329(1)	.249
No	204 (61.1)	130 (38.9)		

Academic stress sources

According to table 22, in comparison between depression toward 8 academic stress sources, only increased workload and depression relationship had significantly differences, the 7 rest sources had no significant of P-value > 0.05.

Increased workload: Among students who answered that increased class working had depressive symptom with 41.7%, unlike this, students did not increase their class workload with 23.8% get depression at P-value = 0.026 for very significantly difference.

Table 23: The relationship between depression and academic sources

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Academic sources				
23. Increased class workload				
Yes	180 (58.3)	129 (41.7)	4.974(1)	.026
No	32 (76.2)	10 (23.8)		
24. Lower grade than anticipated				
Yes	168 (58.1)	121 (41.9)	3.517(1)	.061
No	44 (71.0)	18 (29.0)		
25. Change of Major				
Yes	27 (61.4)	17 (38.6)	.020(1)	.889
No	185 (60.3)	122 (39.7)		
26. Search for graduate school/job				
Yes	51 (52.6)	46 (47.4)	3.428(1)	.064
No	161 (63.4)	93 (36.6)		
27. Missed too many classes				
Yes	113 (58.5)	80 (41.5)	.613(1)	.434
No	99 (62.7)	59 (37.3)		
28. Anticipation of graduation (expectation after graduation)				
˙ Yes	93 (56.0)	73 (44.0)	2.520(1)	.112
No	119 (64.3)	66 (35.7)		
29. Serious argument with instructor				
Yes	19 (65.5)	10 (34.5)	.346(1)	.556
No	193 (59.9)	129 (40.1)		
30. Transferred schools				
Yes	23 (65.7)	12 (34.3)	.459(1)	.498
No	189 (59.8)	127 (40.2)		

Environmental stress sources

Among 10 environmental stress sources, the test to find relationship between those source and depression found that only 3 differences significant with P-value, including messy living conditions, put on hold for extended period of time, and quit job (in table 24).

Messy living conditions

Among students that had messy living conditions, the percentage of students get depression was 48.3% while 35.3% of students that did not have those factors with significantly at P-value = 0.02.

Put on hold for extended period of time

Putting on hold for extended period of time (waiting for something for uncertainty time) as a source of stress was get depression with 46% while those who did not wait for something for uncertainty time get depression only 26.7%. These difference was highly significant at P-value = 0.001.

Quit job

For students that had to quit their job, depressive symptom in them responded at 58.3%, otherwise the percentage of depression in group that had not quite job was 38.2%. There was close to significantly difference at P-value = 0.052

Table 24: The relationship between depression and environmental stress factors

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
Environmental sources				
31. Vacations/breaks				
Yes	126 (58.1)	91 (41.9)	1.295(1)	.255
No	86 (64.2)	48 (35.8)		
32. Waited in long line				
Yes	108 (56.0)	85 (44.0)	3.534(1)	.060
No	104 (65.8)	54 (34.2)		
33. Placed in unfamiliar situation				
Yes	154 (61.4)	97 (38.6)	.336(1)	.562
No	58 (58.0)	42 (42.0)		
34. Change in living environment				
Yes	146 (57.5)	108 (42.5)	3.273(1)	.070
No	66 (68.0)	31 (32.0)		
35. Car trouble				
Yes	112 (56.9)	85 (43.1)	2.361(1)	.124
No	100 (64.9)	54 (35.1)		
36. Computer problems				
Yes	107 (61.8)	66 (38.2)	.300(1)	.584
No	105 (59.0)	73 (41.0)		

Table 24: (continued) The relationship between depression environmental stress
factors

	Depression		χ^2 (df)	P-value
	Non Depressive symptoms n (%)	Depressive symptoms n (%)		
37. Messy living conditions				
Yes	60 (51.7)	56 (48.3)	5.451(1)	.020
No	152 (64.7)	83 (35.3)		
38. Put on hold for extended period of time (waiting for something for uncertainty time)				
Yes	127 (54.0)	108 (46.0)	12.011(1)	.001
No	85 (73.3)	31 (26.7)		
39. Quit job				
Yes	10 (41.7)	14 (58.3)	3.779(1)	.052
No	202 (61.8)	125 (38.2)		
40. Divorce between parents				
Yes	4 (66.7)	2 (33.3)	.100(1)	.752
No	208 (60.3)	137 (39.7)		

* Fisher's exact test

Multivariate analysis

Multivariate analysis was used to describe relationship between depression
and stressors, depression and potential personal consequence factors under influences
of general characteristics. All variables have significant difference in relationship with
depression in bivariate analysis was checked inter-relationship before put in logistic
model concluding ethnicity, type of accommodation, perception of financial status,
whom the student lived with, satisfaction with friend and parents, exercise practice,
and stress factors as working with un-acquainted people, roommate conflict, fight

with friend, minor law violation, decline in personal health, increased class work load, messy living conditions, and put on hold for extended period of time.

Among many different people that students lived with, those who lived their relative and family get less depressive symptoms than the other did not so whom the student lived variable was re-coded as living with family with yes and no values. Similarly, type of accommodation was re-classified as living in dormitory variables with yes and no value based on the highest percentage of students get depressive symptoms was lived in dormitory comparing with other type of accommodations.

In term of inter-relationship, each variable among 16 independent variables was taken out of Logistic model, and then compared chi-squared value, coefficient, and p-value as well in test of model coefficient. If the change was significant, the relationship was checked by chi-square (shown in appendix A) and this variable was not put in logistic model. There were 3 variables shown the inter-relationship including out living in dormitory, living with family and ethnicity. The variable had lower chi-square in Logistic model was chosen in model, the others was taken out of the final model.

The change in chi-square value of model of coefficient of Logistic regression when took out living in dormitory, living with family and ethnicity was presented following:

Took living in dormitory out of model: $\chi^2 = 86.526$

Took living with ethnicity out of model: $\chi^2 = 86.106$

Took living with family out of model: $\chi^2 = 85.106$

With p-value < 0.001, living with family with smaller chi-square value was remained in model, 2 others was rejected.

After controlling all variables and checking inter-relationship, the final model consisted of 8 variables which contributed to depressive out-come significantly with p-value < 0.05.

Table 25: The relationship between depression and related factors in Logistic regression model

Logistic regression model (n=351)	B	OR	P-value	95.0% C.I.	
				Lower	Upper
Lived with family	-.989	.372	<.001	.224	.618
Satisfaction of relationship with parents	.570	1.769	.010	1.149	2.724
Satisfaction with friendship	.613	1.845	.004	1.211	2.810
Exercise practice	-.314	.730	.003	.593	.899
Working with un-acquainted people	-.638	.528	.013	.319	.874
Fight with friend	1.032	2.806	.015	1.223	6.436
Decline in personal health	.696	2.007	.007	1.206	3.340
Put on hold for extended period of time	.717	2.049	.009	1.199	3.501

When Students who lived with their family and their relative, the risk to get depressive symptoms reduced 0.372 times at p-value < 0.001 and coefficient = 0.989.

Satisfaction of relationship with parents also had positive (B=0.570) effect on depression. When students change their feeling such as from satisfy to not satisfy, the risk to get depressive symptom increased by odds ratio = 1.769 significantly by p-

value 0.010. Similarly, satisfaction with friendship was significant positive effect on depression with odds ratio = 1.845 and p-value = 0.004.

In terms of potential personal consequence factors, exercise practice effects negatively on group had depressive symptoms. At p-value = 0.003, the risk of depression likely increases 0.7 times when student reduces frequency of doing exercise one level.

As a stressor, with negative effect of coefficient, students who worked with un-acquainted people reduced risk of depression 0.493 at p-value=0.009.

Students who fought with their friends increased risk to get depressive symptoms with odd ratio = 2.806 at p-value = 0.015 and coefficient = 1.032.

Regarding intrapersonal stress factors, students decline in personal increased risk of depression 2 times with p-value = 0.007 at coefficient = 0. 696.

Students who had to wait for something so long increased risk to get depression 2.049 times with coefficient B = 0. 717 and p-value= 0.09.