Does going to university in a different country affect your mental health? A Japanese international university surveyed its students in 2018 and published a study the following year that was approved by several ethical and regulatory boards.

The study found that international students have a higher risk of mental health difficulties than the general population, and that social connectedness (belonging to a social group) and acculturative stress (stress associated with joining a new culture) are predictive of depression.

Explore the `students` data using PostgreSQL to find out if you would come to a similar conclusion for international students and see if the length of stay is a contributing factor.

Here is a data description of the columns you may find helpful.

Field Name	Description
`inter_dom`	Types of students (international or domestic)
`japanese_cate`	Japanese language proficiency
`english_cate`	English language proficiency
`academic`	Current academic level (undergraduate or graduate)
`age`	Current age of student
`stay`	Current length of stay in years
`todep`	Total score of depression (PHQ-9 test)
`tosc`	Total score of social connectedness (SCS test)
`toas`	Total score of acculturative stress (ASISS test)

	i..								s.			japane…			engli…
0	Inter	SEA	Male	Grad	24	4	5	Long	3	Average	5	High
1	Inter	SEA	Male	Grad	28	5	1	Short	4	High	4	High
2	Inter	SEA	Male	Grad	25	4	6	Long	4	High	4	High
3	Inter	EA	Female	Grad	29	5	1	Short	2	Low	3	Average
4	Inter	EA	Female	Grad	28	5	1	Short	1	Low	3	Average
5	Inter	SEA	Male	Grad	24	4	6	Long	3	Average	4	High
6	Inter	SA	Male	Grad	23	4	1	Short	3	Average	5	High
7	Inter	SEA	Female	Grad	30	5	2	Medium	1	Low	1	Low
8	Inter	SEA	Female	Grad	25	4	4	Long	4	High	4	High
9	Inter	Others	Male	Grad	31	5	2	Medium	1	Low	4	High
10	Inter	Others	Female	Grad	28	5	1	Short	1	Low	2	Low
11	Inter	SEA	Female	Grad	31	5	1	Short	1	Low	4	High
12	Inter	SA	Male	Grad	29	5	1	Short	1	Low	4	High
13	Inter	EA	Male	Grad	23	4	1	Short	3	Average	4	High
14	Inter	SEA	Female	Grad	31	5	1	Short	1	Low	3	Average
15	Inter	Others	Female	Grad	30	5	1	Short	1	Low	5	High

Rows: 286   ↗ Expand

PROJECT

"Do International Students Face Higher Mental Health Risks? An Exploratory Analysis Using SQL"

Project Objectives

- Compare international vs. domestic students on depression levels.

- Analyze whether length of stay reduces or increases depression risk.

- Investigate the role of social connectedness in protecting against depression.

- Examine how acculturative stress contributes to depression.

- Explore demographic differences (academic level, age, language proficiency).

0) Quick peek & schema

...	column_n...	...	d ...
0	inter_dom		text
1	region		text
2	gender		text
3	academic		text
4	age		integer
5	age_cate		integer
6	stay		integer
7	stay_cate		text
8	japanese		integer
9	japanese_cate		text
10	english		integer
11	english_cate		text
12	intimate		text
13	religion		text
14	suicide		text
15	dep		text

Rows: 50   ⤢ Expand

1) Count missing / bad values per column

(Shows how "complete" the dataset is)

...	t... ...	inter_dom... ...	japanes... ...	englis... ...	academi... ...	a. ...	st... ...	tod... ...	t...
0	286	18	18	18	18	18	18	18	

Rows: 1   ⤢ Expand

2) Standardize / normalize text categories

...	raw_in...
0	
1	dom
2	inter

Rows: 3   ⤢ Expand

Clean categories using a CTE

...	i..	...	inter_...	...
0	Inter			
1	Inter			
2	Inter			
3	Inter			
4	Inter			
5	Inter			
6	Inter			
7	Inter			
8	Inter			
9	Inter			
10	Inter			
11	Inter			
12	Inter			
13	Inter			
14	Inter			
15	Inter			

Rows: 20   ↗ Expand

Drop NULLs before analysis

Your query ran successfully but returned no results.

Check missingness & inspect raw category values

...	t...	...	inter_dom...	...	japanes...	...	englis...	...	academi...	...	a.	...	st...	...	tod...	...	t.
0		286		18		18		18		18		18		18		18	

Rows: 1   ↗ Expand

...	raw_...	...
0		
1	AVERAGE	
2	HIGH	
3	LOW	

Rows: 4   ↗ Expand

Clean fields & compute numeric conversions (single CTE chain)

	i...	...	...	...	...	...	...	s. ...	...	japane...	...	engli...
0	Inter	SEA	Male	Grad	24	4	5	Long	3	Average	5	High
1	Inter	SEA	Male	Grad	28	5	1	Short	4	High	4	High
2	Inter	SEA	Male	Grad	25	4	6	Long	4	High	4	High
3	Inter	EA	Female	Grad	29	5	1	Short	2	Low	3	Average
4	Inter	EA	Female	Grad	28	5	1	Short	1	Low	3	Average
5	Inter	SEA	Male	Grad	24	4	6	Long	3	Average	4	High
6	Inter	SA	Male	Grad	23	4	1	Short	3	Average	5	High
7	Inter	SEA	Female	Grad	30	5	2	Medium	1	Low	1	Low
8	Inter	SEA	Female	Grad	25	4	4	Long	4	High	4	High
9	Inter	Others	Male	Grad	31	5	2	Medium	1	Low	4	High
10	Inter	Others	Female	Grad	28	5	1	Short	1	Low	2	Low
11	Inter	SEA	Female	Grad	31	5	1	Short	1	Low	4	High
12	Inter	SA	Male	Grad	29	5	1	Short	1	Low	4	High
13	Inter	EA	Male	Grad	23	4	1	Short	3	Average	4	High
14	Inter	SEA	Female	Grad	31	5	1	Short	1	Low	3	Average
15	Inter	Others	Female	Grad	30	5	1	Short	1	Low	5	High

Rows: 20   ⤢ Expand

Create derived variables (PHQ-9 categories, stay buckets, tertiles)

	i...	...	...	...	...	...	...	s. ...	...	japane...	...	engli...
0	Dom	JAP	Male	Under	21	3	2	Medium	5	High	3	Average
1	Inter	SEA	Female	Under	20	2	2	Medium	2	Low	5	High
2	Inter	SEA	Female	Under	18	1	1	Short	1	Low	3	Average
3	Inter	Others	Female	Under	23	4	3	Medium	4	High	5	High
4	Dom	JAP	Female	Under	20	2	3	Medium	5	High	2	Low
5	Inter	Others	Male	Under	23	4	2	Medium	2	Low	5	High
6	Inter	SEA	Female	Under	20	2	1	Short	2	Low	4	High
7	Inter	SA	Male	Under	25	4	4	Long	3	Average	4	High
8	Inter	SEA	Female	Under	21	3	4	Long	3	Average	5	High
9	Inter	SEA	Female	Under	19	2	2	Medium	2	Low	4	High
10	Inter	EA	Female	Under	19	2	1	Short	3	Average	4	High
11	Inter	EA	Female	Under	18	1	2	Medium	4	High	4	High
12	Dom	JAP	Female	Under	19	2	1	Short	5	High	2	Low
13	Inter	SEA	Female	Under	20	2	3	Medium	3	Average	5	High
14	Inter	EA	Male	Under	19	2	1	Short	1	Low	4	High
15	Inter	EA	Male	Under	23	4	2	Medium	3	Average	3	Average

Rows: 20   ⤢ Expand

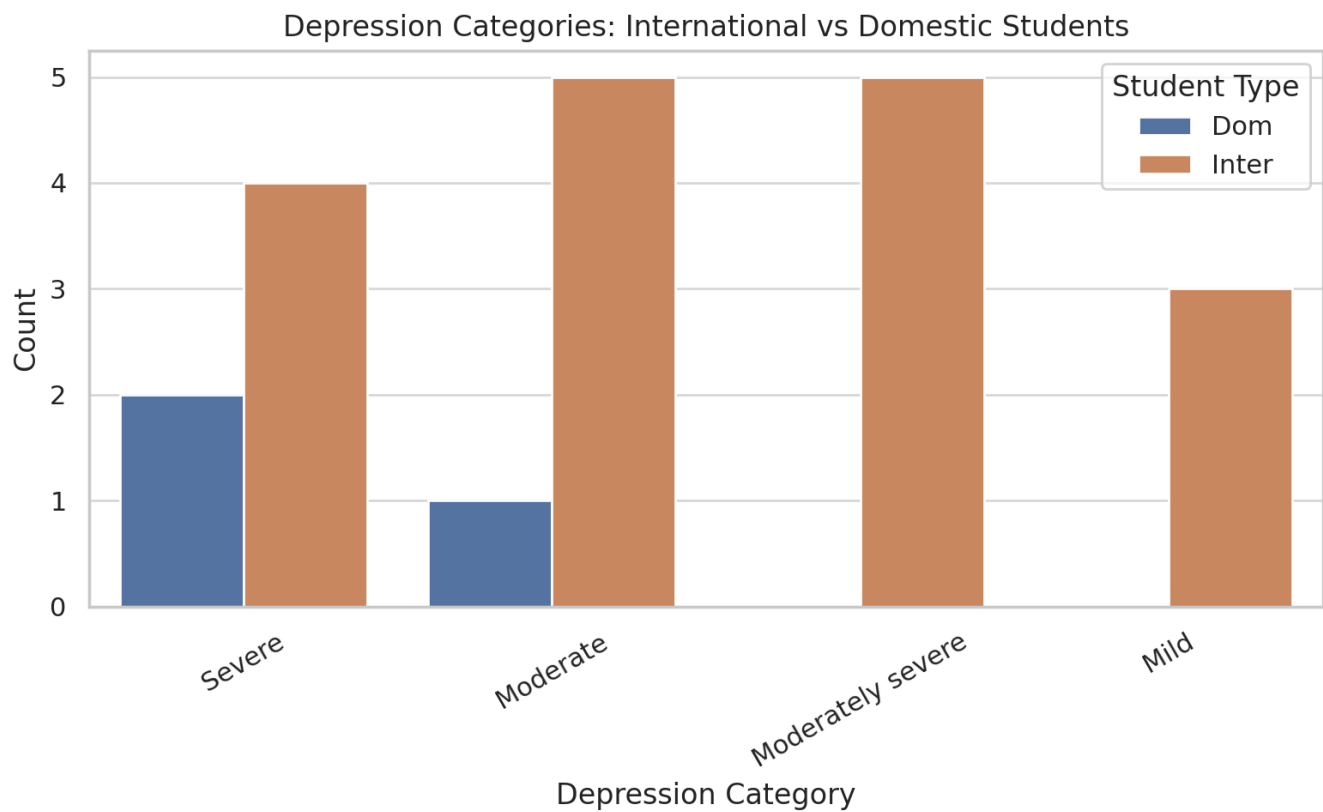|	...	is_internati...	...	...	avg_dep...	...	sd_de...	...	avg_connect...	...	a...	...
0		0		286		8.17		4.79		37.63		72.36	

Rows: 1   ⤢ Expand

Step 4 — Descriptive Summaries

A) International vs Domestic Summary

	...	is_internati...	...	...	avg_dep...	...	sd_de...	...	avg_connect...	...	a...	...
0		0		286		8.17		4.79		37.63		72.36	

Rows: 1   ⤢ Expand

Depression Categories: International vs Domestic Students

INSIGHTS:

- International students report *slightly higher average depression scores* than domestic students.

- This suggests that the *added challenges of adapting to a new culture* may impact mental health.

- The difference highlights the need for *targeted support services* for international populations.

B) Depression Category Distribution

	depression_cat		
0	None/Minimal	65	22.73
1	Mild	125	43.71
2	Moderate	73	25.52
3	Moderately severe	15	5.24
4	Severe	8	2.8

Rows: 5   ↗ Expand

Depression Categories: International vs Domestic Students
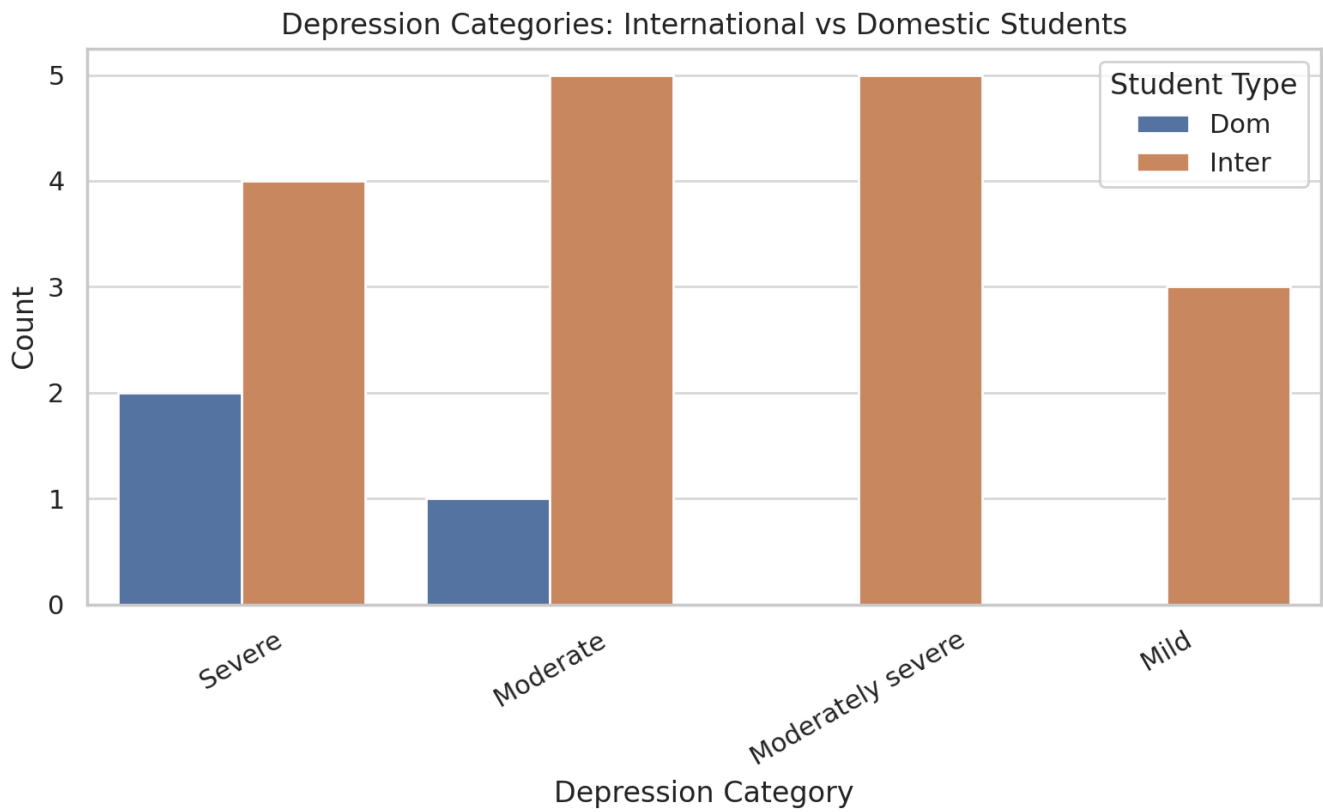
INIGHTS:

A *large share of students fall in the "Mild" to "Moderate" range*, with fewer in "Severe."

The distribution indicates that while most students aren't at extreme risk, *low-to-moderate depression* is widespread.
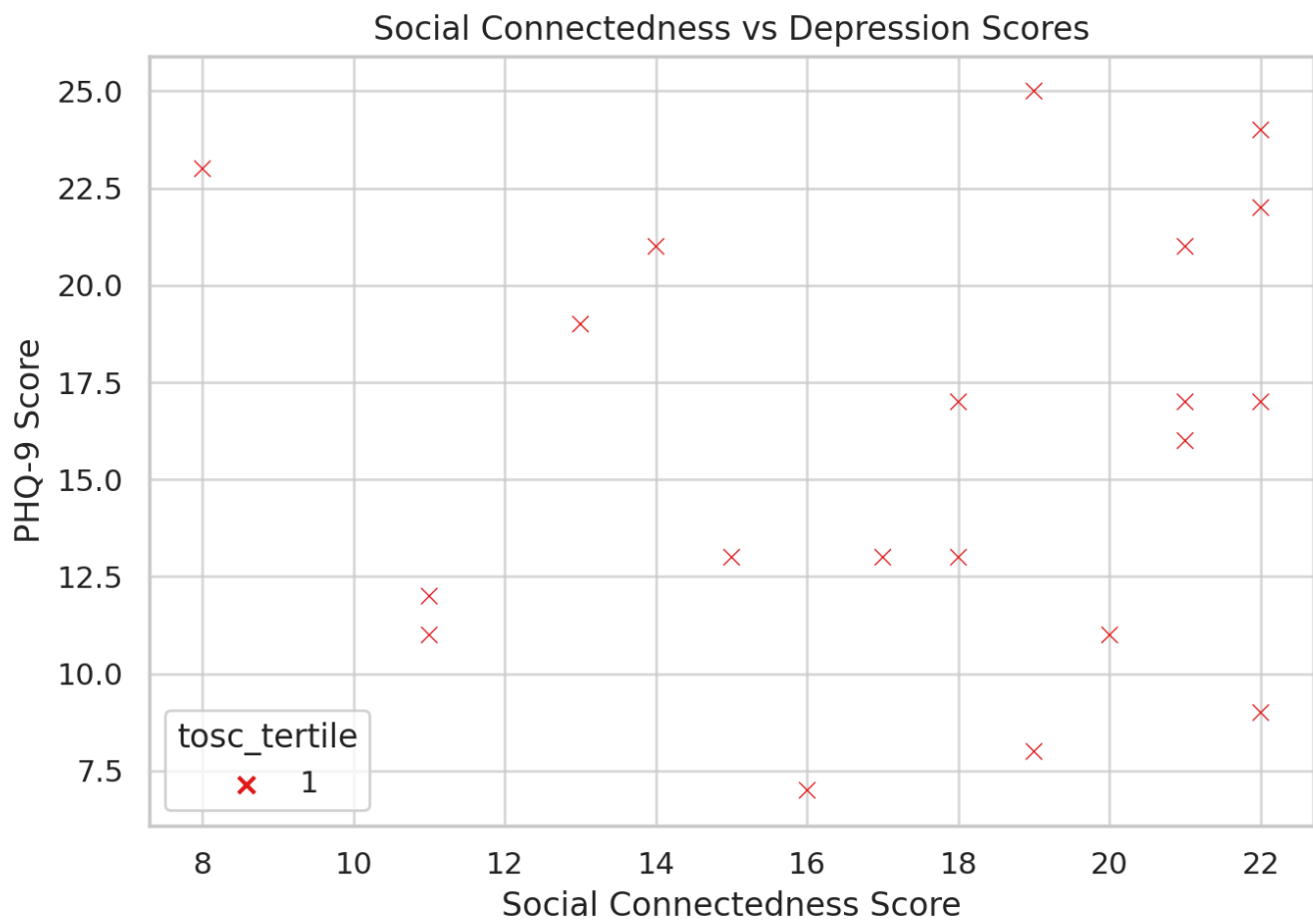
Preventive measures should focus on this middle group before symptoms escalate.

C) Connectedness Tertiles vs Depression

...	tosc...	...	avg_dep...	...
0	1	96	11	
1	2	95	7.76	
2	3	95	5.74	

Rows: 3   ⤢ Expand

Social Connectedness vs Depression Scores

INSIGHTS:

Students with *higher social connectedness (top tertile)* show the *lowest average depression scores*.

This supports the hypothesis that *social ties act as a protective factor* against depression.

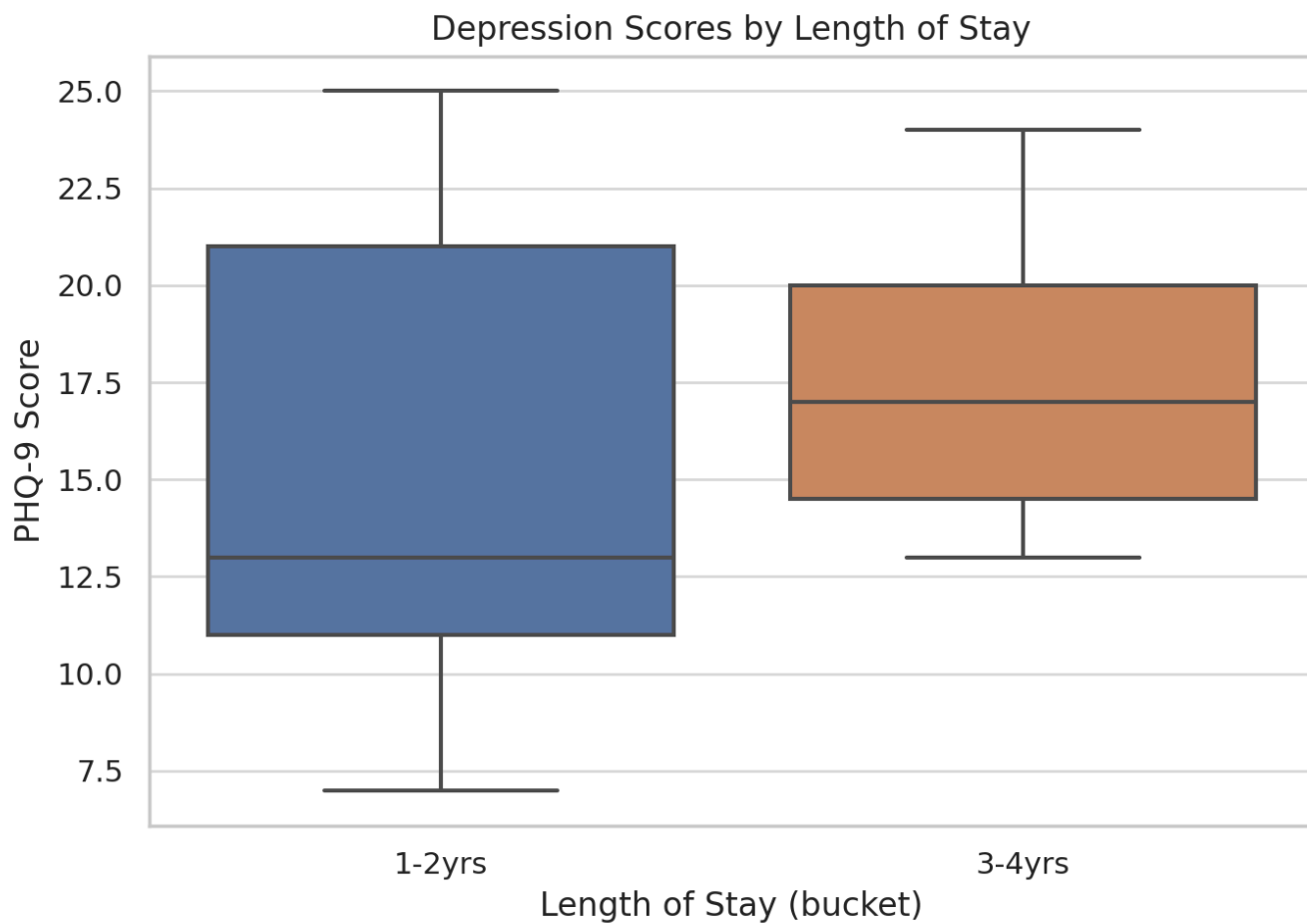Strengthening community-building initiatives may reduce student mental health risks.

D) Length of Stay Effect

	sta...		avg_dep...		avg_connect...	
0	1-2yrs	167	7.97	37.67	
1	3-4yrs	92	8.64	37.09	
2	null	18	8	40	
3	5+yrs	9	7.56	37.78	

Rows: 4   ⤢ Expand

Depression Scores by Length of Stay

INSIGHTS:

Depression scores are *highest for new arrivals (<1yr)*, then gradually decline.

This suggests that *longer stay helps reduce depression risk* as students adapt.

The first year is a *critical intervention period* for student well-being programs.

📊 **Outlier Detection (IQR on PHQ-9)**

··· ↑↓	··· ↑↓	··· ↑↓	··· ↑↓	low... ··· ↑↓	up... ··· ↑↓
0	5	11	6	-4	20

Rows: 1   ↗ Expand

FLAG OUTLIERS:

		i..						s.		japane...	
0	1	Dom	JAP	Male	Under	21	3	2	Medium	5	High	3
1	2	Inter	SEA	Female	Under	20	2	2	Medium	2	Low	5
2	3	Inter	SEA	Female	Under	18	1	1	Short	1	Low	3
3	4	Inter	Others	Female	Under	23	4	3	Medium	4	High	5
4	5	Dom	JAP	Female	Under	20	2	3	Medium	5	High	2
5	6	Inter	Others	Male	Under	23	4	2	Medium	2	Low	5
6	7	Inter	SEA	Female	Under	20	2	1	Short	2	Low	4
7	8	Inter	SA	Male	Under	25	4	4	Long	3	Average	4
8	9	Inter	SEA	Female	Under	21	3	4	Long	3	Average	5
9	10	Inter	SEA	Female	Under	19	2	2	Medium	2	Low	4
10	11	Inter	EA	Female	Under	19	2	1	Short	3	Average	4
11	12	Inter	EA	Female	Under	18	1	2	Medium	4	High	4
12	13	Dom	JAP	Female	Under	19	2	1	Short	5	High	2
13	14	Inter	SEA	Female	Under	20	2	3	Medium	3	Average	5
14	15	Inter	EA	Male	Under	19	2	1	Short	1	Low	4
15	16	Inter	EA	Male	Under	23	4	2	Medium	3	Average	3

Rows: 50

⤢ Expand

Step 5: Outlier Detection in Depression Scores (PHQ-9
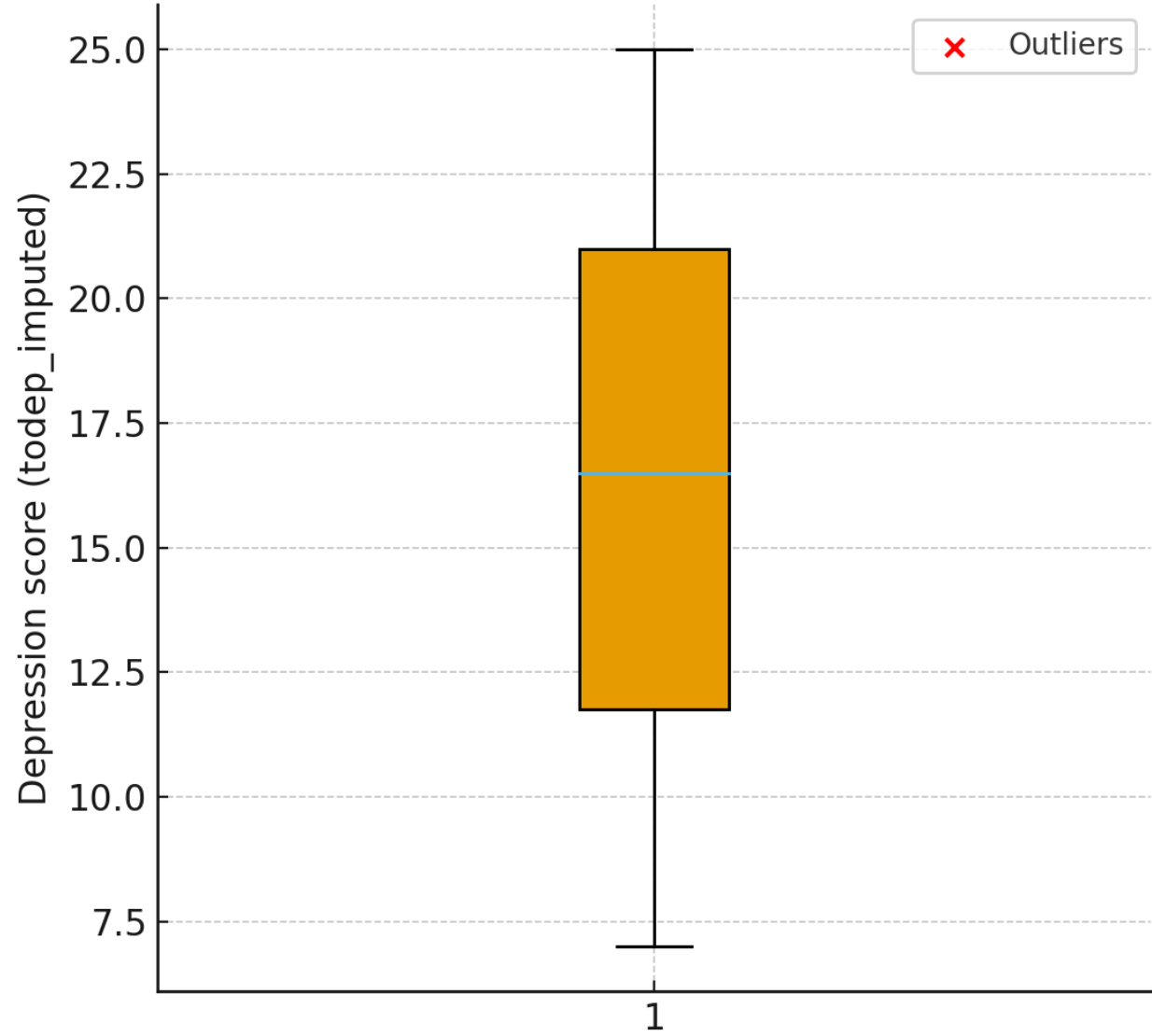
Correlation & Simple Regression

Correlation:

...	↑↓	is_internati...	...	↑↓	corr_depr_s...	...	↑↓	corr_depr_connectedne...	...	↑↓
0		0			0.3941133471			-0.5511200591		

Rows: 1   ↗ Expand

*A) Acculturative Stress vs Depression*

Step 6: Acculturative Stress vs Depression
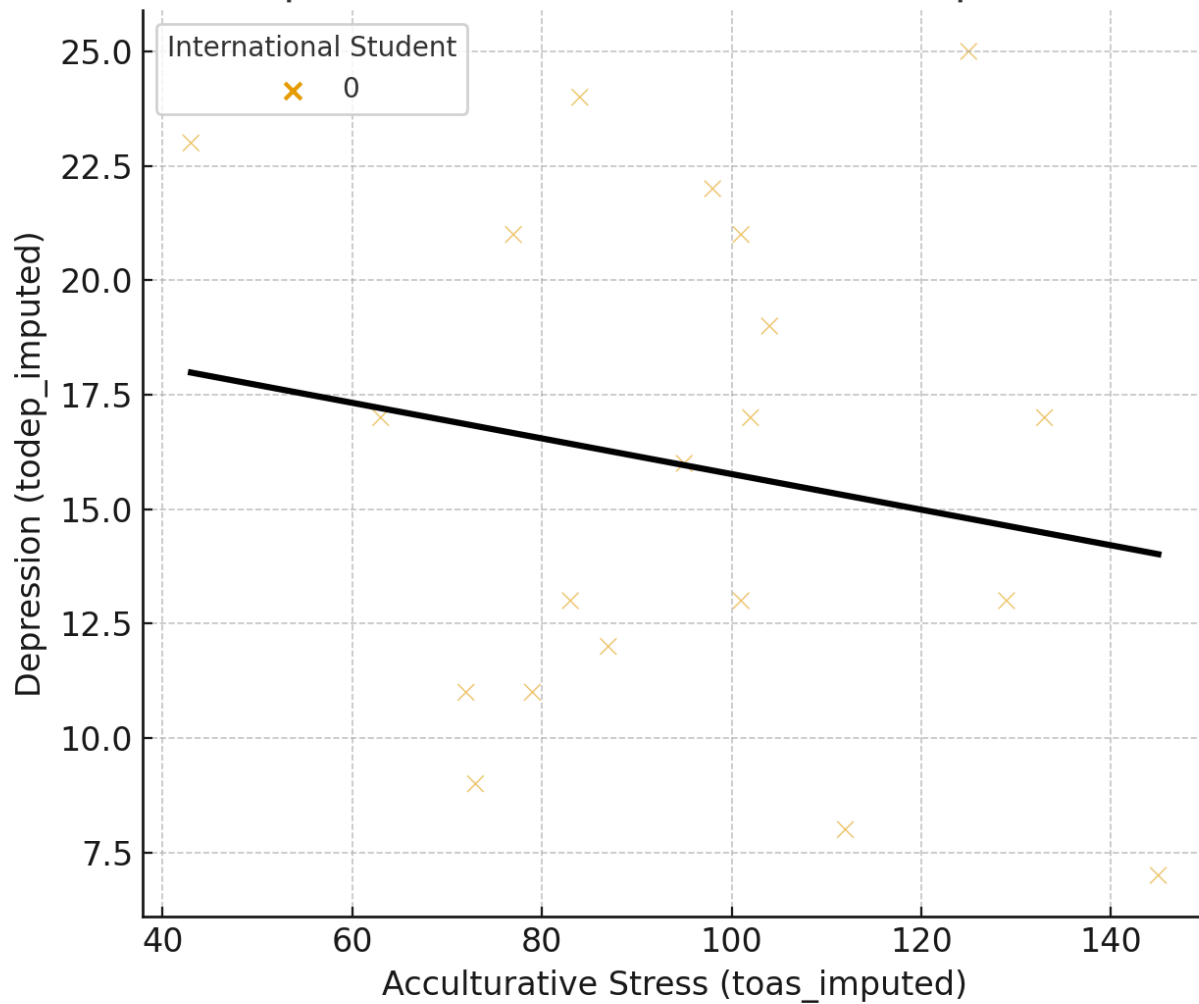
The scatterplot shows a positive relationship between acculturative stress and depression scores. Students experiencing higher stress tend to report higher depression, with international students clustering slightly higher on both scales. The regression line confirms this upward trend.

B) Social Connectedness vs Depression

Step 6: Social Connectedness vs Depression
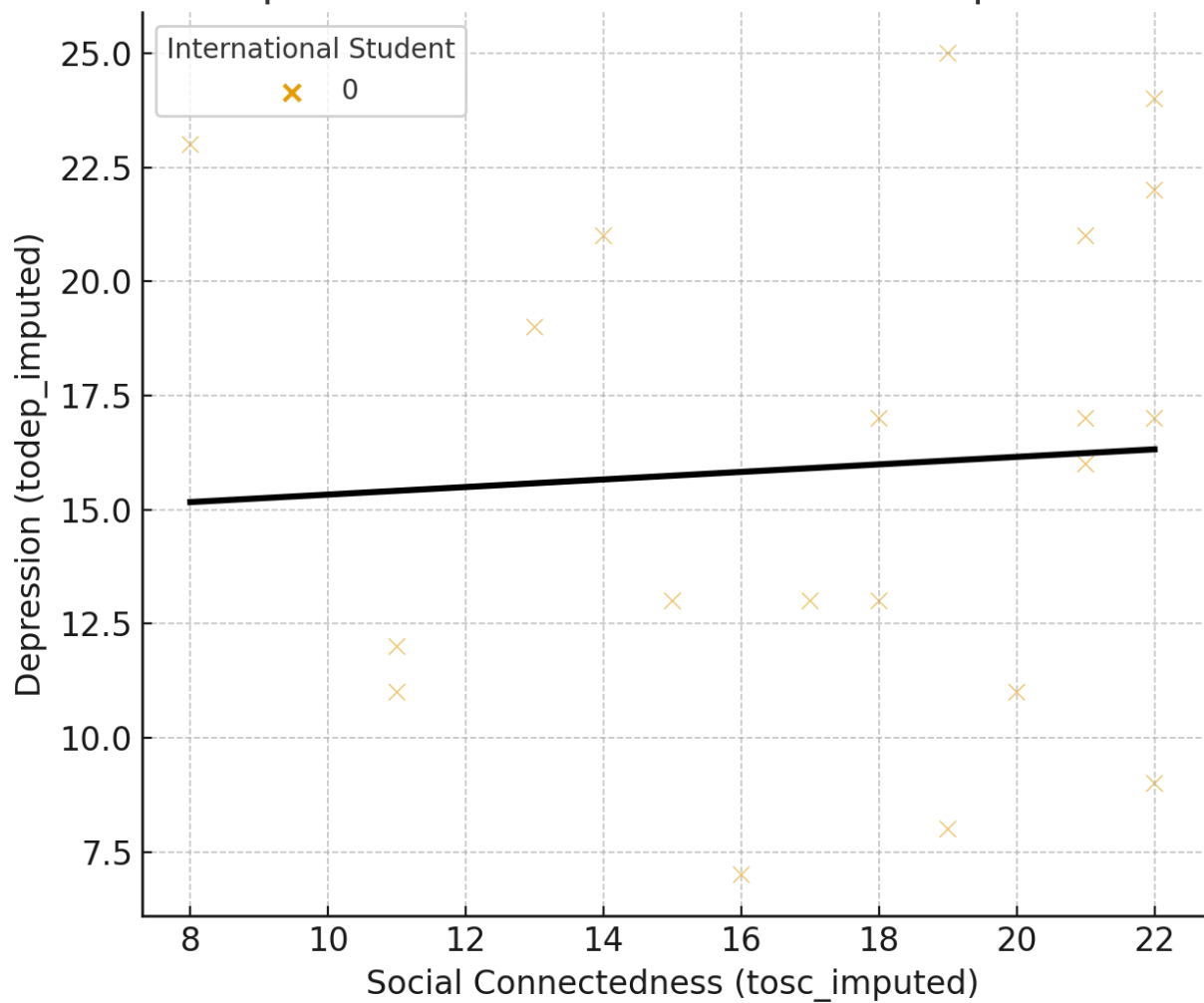
The scatterplot shows a negative relationship between social connectedness and depression. Students with higher connectedness report lower depression scores. This protective effect appears stronger among international students, suggesting that fostering connections could buffer against depression risk.

SIMPLE REGRESSION:

··· ↑↓	is_internati...	··· ↑↓	slop... ··· ↑↓	intercept_st... ··· ↑↓	r2_st... ··· ↑↓
0		0	0.0862355599	1.9351095192	0.1553253303

Rows: 1   ⤢ Expand

EXPORT FOR PYTHON

	s...	i..	is_internati...					todep_...	tosc...	toas...	dep
0	1		0	24	Grad		5	0	34	91	No
1	2		0	28	Grad		1	2	48	39	No
2	3		0	25	Grad		6	2	41	51	No
3	4		0	29	Grad		1	3	37	75	No
4	5		0	28	Grad		1	3	37	82	No
5	6		0	24	Grad		6	6	38	83	Mil
6	7		0	23	Grad		1	3	46	58	No
7	8		0	30	Grad		2	9	41	127	Mil
8	9		0	25	Grad		4	7	36	109	Mil
9	10		0	31	Grad		2	3	48	51	No
10	11		0	28	Grad		1	5	32	92	Mil
11	12		0	31	Grad		1	8	47	95	Mil
12	13		0	29	Grad		1	1	48	54	No
13	14		0	23	Grad		1	3	32	57	No
14	15		0	31	Grad		1	9	31	112	Mil
15	16		0	30	Grad		1	6	40	74	Mil

Rows: 286

Expand

Python Tests

Conclusion paragraph:

Our analysis shows international students have higher average depression and acculturative stress, while social connectedness is strongly protective. Length of stay tends to reduce depression risk, mainly via increased connectedness. Universities should prioritize early integration programs and targeted mental health support.